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Artificial Intelligence Applications in Online Purchase Behaviour Research: A Bibliometric Analysis (2005–2025)

– Pooja Patel*

Research Scholar, Indira Gandhi National Open University, Delhi, India

poojapatel93199@gmail.com *https://orcid.org/0009-0003-4870-0292*

– Rashmi Bansal

Professor, Indira Gandhi National Open University, Delhi, India

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ABSTRACT

Purpose: This paper seeks to provide thorough bibliometric review of Artificial Intelligence (AI) and online purchase behaviour (OPB) over the 2005-2025 period. The aim is to determine the major themes, trends, authors with great influence, and collaboration patterns around the world in terms of this dynamic emerging new academic discipline.

Design/Methodology/Approach: The study is carried out on 1,327 peer-reviewed articles and reviews extracted in the Web of Science Core Collection. A well-designed Boolean search strategy was used to locate pertinent literature between the years 2005 to 2025. Based on this data, the analysis of pattern keywords and co-occurrence was performed as well as the network structure and thematic clusters with the help of Biblioshiny and VOSviewer. The trends in publishing, authors who influence publications, relevant journals, and single-country contributions are some of the aspects that are reflected by the analysis. Co-word mapping was used to define thematic groupings and seven majorties were identified such as recommender systems and the sentiment-driven AI as well as ethical personalization and real-time predictive modeling.

Findings: The review revealed the appearance of the high rate of related OPB AI publications after 2018 with the main characters of recommender systems, sentiment analysis, and chatbots. IEEE Access and Expert Systems with Applications turned out to be dominant sources. China, USA and India top the list of research outputs, and Singapore and Germany have high average cites. The growing domains are generative AI, trust modelling, and recommendations personalisation.

Originality/Value: It is also an early specific bibliometric investigation of the use of AI in OPB. The paper defines an organized thematic map, identifies an untapped area of research such as explainable AI and real-time personalization, and acts as a research proposal to be followed by academia and practitioner planning in AI-based commerce.

Keywords: Online Purchase Behaviour, Artificial Intelligence, Bibliometric Analysis, Consumer Behaviour, VOSviewer, Biblioshiny.

Paper Type: Review of Literature

***Corresponding Author** (Pooja)*

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Introduction

Artificial Intelligence (AI) has transformed online consumer behaviour and digital retail planning by its incorporation in the e-commerce. According to Statista (2024), the scale of the global AI-in-retail market may increase sharply in the future, developing to the extent of approximately $24.1 billion by 2028, yet, all indications point to it becoming central to the development of commerce in the future. To add to that, 2023 Consumer Insights Survey conducted by PwC has revealed that 73 percent of online shoppers desire a personalized experience, and more than half communicate with a chatbot prior to a purchase decision. Nevertheless, this fast application of AI systems is alarming as well. The OECD (2022) noted the need to carefully approach AI applications to e-commerce, especially, when it considers transparency, fairness and ethics regarding consumer data.

As described in the academic literature, AI-based solutions, such as recommender systems, chatbots, predictive analytics, and sentiment analysis, have been regarded as important technologies to boost online purchase behaviour (Kaur & Gubbala, 2025; Hanafi et al., 2024). The tools are not only able to streamline user engagement and automate decision support but also provide psychological and emotional cues in the digital shopping processes. In the last 20 years, the electronic commerce interfaces have evolved to no longer be catalog-based, but algorithmically intelligent, personalized shopping environments (Rodriguez-Vasquez et al., 2025; Wu et al., 2025).

This transition is handled as well by machine learning (ML), and natural language processing (NLP). Chatbots, which are powered by AI, have been in deployment to cover complicated dialogues, which involve individual and customized feedback, query resolution, and pre and post-purchase parts (Denis, 2025). Predictive analytics models allow companies to forecast consumer behavior so that they can do better targeted advertising, have better inventory planning and customer retention (Sultanpure et al., 2024).

Though such technological changes, ethical issues have become more vocal when it comes to algorithm bias, explainable algorithms, and misuse of data. Academics have started doubting the extent to which AI systems determine consumer agency and whether individualization can devolve into the process of manipulating or even intruding others (De et al., 2025). As such, responsible AI deployment is no longer optional but essential.

Although a number of descriptive reviews as well as platform-specific reports (e.g., chatbots, recommendation systems) have been published, no story map of AI research in the online purchase behaviour over a time span of 20 years has been traced by focusing on bibliometrically available data. Extant literature is uneven - too short in scope, focused on specific tools or case studies of specific regions, or strictly limited to specific time periods - without providing a holistic picture of how this area of research has developed.

In line with this, the following study applies a longitudinal bibliometric optimization of 1,327 scholarly papers (articles + reviews) retrieved in the Web of Science Core Collection and published in the period of 2005-2025. Based on the longitudinal bibliometric analysis conducted in 2005 to 2025, this paper seeks to explore the intellectual structure, thematic hotspots, and the emerging research hotspots within the framework of Artificial Intelligence applications in Online Purchase Behaviour (OPB) through the use of bibliometric tools of Biblioshiny and VOSviewer.

Objectives:

In an endeavour to realize the mentioned objective, the study sets the following objectives:

- To analyze the trend of articles on AI in the online purchase behaviour between the periods of years 2005 to 2025.
- To establish the most influential authors, countries and journals in this field.
- To identify the main thematic clusters use of the co-occurrence network of keywords .
- To chart out the current research gaps and propose new directions of future research.

Review of Literature

The online purchase behaviour (OPB) studies have been one of the important themes in the current literature of digital commerce due to the inclusion of Artificial Intelligence (AI). Amid the growing consumer demand on AI-based solutions, such as chatbots and recommender systems, as well as predictive models, scholars have used bibliometrics to trace the development of the field in question (Srivastav et al., 2025; Wu et al., 2025).

Foundations in AI and Digital Consumer Behaviour

Among the first and the most focused studies on the bibliometric analysis of the effect of AI and digital marketing on consumer behaviour. Co-word analysis and thematic clustering have helped them unveil the ways in which AI-driven methods of sentiment analysis, recommendation engines, and others influence the youth-based e-commerce strategy. Their research highlighted the fact that there has been an upsurge in terms regarding AI after 2018 that do not coincide with the onset of the digital personalization trend (Srivastav et al., 2025).

Stream Commerce and AI Promotion Techniques

The biliometric network analysis by Ha et al investigated live streaming commerce together with sales promotion. They recommend that behaviour of impulse buying is becoming more affected by recommendation models based on AI embedded in real-time retailing interfaces. Three of the thematic clusters pointed at the shifting research directions of the keywords of trust, timing of promotions, and AI influencers (Ha et al., 2025).

Mapping E-commerce through Thematic Trends

In a more general bibliometric analysis, Rodriguez-Vasquez et al. traced the topics of digital business, including AI and big data, and consumer trust. The outcomes of their activity point to the fact that there will be an ongoing process of shifting to more data-driven, more AI-personalized e-commerce systems, especially in the year 2020 and onwards. They used a playbook thematic map where they discovered the key topics gaining focal points as machine learning, consumer satisfaction, and automation (Rodriguez-Vasquez et al., 2025).

Augmented Reality and Emerging Tech Pathways

As per a study by Wu, Hashim and Alam, the intersection of theory dealing with technology acceptance alongside AI and livestreaming trade was investigated. Their bibliometric approach proved the shift in themes of manual shopping towards mobile-first and artificial intelligence-based immersive commerce. The more recent clusters which are germinating in the literature of OPB are AR-assisted buying, AI avatars and virtual assistance (Wu et al., 2025).

Longitudinal Patterns in Online Shopping Themes

Nguyen Hoang and Ngo provided schemes about world research interests in online shopping, and the development of crucial terms possessing AI correlations and relations in 2020 - 2024 years. According to their co-occurrence mapping, they saw an increasing interest in the terms such as "generative AI", "fraud detection", "chatbots", and "consumer profiling". Their results confirm a shift in the approaches in researching OPB within a more interdisciplinary bridge between pure marketing to AI-engineered commerce (Nguyen Hoang & Ngo, 2024).

Although other bibliometric research has elaborated on AI in online commerce and digital marketing, the majority of these research works have limited scopes (2020 - 2024) and limited platforms like livestreaming or mobile shopping (Srivastav et al., 2025; Wu et al., 2025).

This study fills these gaps by offering a comprehensive, multi-tool bibliometric analysis, mapping 20 years of AI-driven consumer behaviour research, and identifying both established themes and emerging research directions. Those seldom concern the long-term thematic dynamics (2005 - 2025) or discuss original technologies such as ChatGPT and generative AI and explainable AI. In addition, country-specific contributions, the effect of institutional networks, and consumer-oriented results, including trust and satisfaction, are underrepresented. The integration of tool approaches does not exist in current literature either; the combination of keyword networks, citation mapping, and thematic tracking.

Research Methodology

Table 1. Data Extraction and Processing Summary

Aspect	Details
Initial Records Retrieved	2,226 (without any filters)
Data Source	Web of Science (Core Collection)
Search String	("artificial intelligence" OR "AI" OR "machine learning" OR "chatbot*" OR "recommender system*" OR "predictive analytics") AND ("online purchase behaviour" OR "online buying behaviour" OR "online shopping behaviour" OR "e-commerce" OR "consumer behaviour"))
Document Types	Articles + Reviews
Years	2005–2025
Language	English
WoS Categories	Computer Science Information Systems or Computer Science Artificial Intelligence or Business or Management
Total Records Retrieved	1,410
Duplicates Removed	83
Final Dataset Used	1,327
File Format	.txt (Web of Science full record with references)

Inclusion Criteria:

- In the journals indexed in Web of Science Core Collection.
- Forms of documents limited to peer reviewed articles and reviews.
- The language was restricted to the English language.
- This can be published in computer Science- Information systems, Computer Science- Artificial intelligence, Business or management.

Exclusion Criteria:

- Duplicate records and incomplete bibliographic entries.
- Non- English language books.
- Abstracts to conference and book chapters, letters and editorials.
- Studies based on offline purchase behaviour or non-customer centric AI applications (e.g. industrial automation, robotics not related to commerce).

This paper uses a bibliometric approach to analyse the development of studies relating to problems of applying artificial intelligence (AI) in online purchase behaviour. The information was retrieved based on the Web of Science Core Collection with the help of highly specific keywords combinations implying AI (e.g., machine learning, recommender systems, chatbots) and consumer behaviour (e.g., e-commerce, online purchase behaviour).

Articles and Reviews published in English within the years 2005-2025 under four Web of Science categories were searched: Computer Science- Computer Science and Artificial Intelligence, Information Systems, Business and Management. The first request returned 2,226 documents. A total of 1,410 document records were returned. Only 1,327 records were then left after removing 83 duplicate entries.

The records were exported to .txt format (full record with cited references) and analyzed with the help of two main tools are the Biblioshiny (R) to analyze performance, annual changes, and topic development; VOSviewer to visualize the co-occurrence networks of keywords and new research directions. This usage of two tools made it possible to examine the intellectual landscape both quantitatively and visually, which follows best practices in bibliometric research (Donthu et al., 2021; Aria & Cuccurullo, 2017).

Results and Analysis

Subject Area Distribution Analysis Based on Web of Science

With respect to subject areas of the literature retrieved, as presented in Figure 1, there is a high level of interdisciplinary disposition, as most of the studies are classified in Computer Science - Information Systems (n=608) and Computer Science - Artificial Intelligence (n=550), which is in line with the technology basis of AI applications in digital commerce. Business (n = 341) and Management (n = 194) also have substantial contributions that point out the aspects of strategic or consumer behavior. Other domains where there will be interest displayed will be technical infrastructure, optimization model, and operational decision-making in e-commerce systems, such as Telecommunications (n=182), Engineering, Electrical and Electronic (n=322), and Operations Research and Management Science (n = 116). The existence of such categories as Computer Science Interdisciplinary Applications, Software Engineering, or Theory & Methods also confirm the multidimensional character of research on the boundary between AI and the online purchase behaviour.

Figure 1. Distribution of articles across Web of Science subject categories.

Dataset Overview in Biblioshiny

Table 2. Main Information about dataset

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2005:2025
Sources (Journals, Books, etc)	254
Documents	1327
Annual Growth Rate %	16.59
Document Average Age	3.78
Average citations per doc	23.54
References	62185
DOCUMENT CONTENTS	
Keywords Plus (ID)	1544
Author's Keywords (DE)	4153
AUTHORS	
Authors	4089
Authors of single-authored docs	69
AUTHORS COLLABORATION	
Single-authored docs	70
Co-Authors per Doc	3.73
International co-authorships %	33.46
DOCUMENT TYPES	
article	1119
article; data paper	1
article; early access	80
article; early access; retracted publication	1
article; proceedings paper	18
article; retracted publication	16
review	89
review; early access	3

In Table 2, the overall bibliometric database resulted in 1,327 academic documents retrieved through the use of the Web of Science Core Collection and tracking the period of 2005-2025. The 254 sources of the journals and publication outlets used in compiling the documents indicate a strong and cross cutting literature base. The Science production rate was quite high at the rate of 16.59%, which mean that interest in the area of research in AI-driven online consumer behavior is accelerating. Mean per document citations/document was 23.54 and mean document age was 3.78 years that shows clustering of highly-cited recent work. Taken together, the data together cited more than 62,000 works (n = 62,185) indicating the intellectual wealth of the discipline.

The content of the corpus incorporated 4,153 keywords assigned by the authors of the 92 articles (DE), and 1,544 Keywords Plus (ID), which was subsequently utilized in co-occurrence and points-of-view studies. The 4,089 different scholars who produced this collection of publications had a co-author rate of 3.73 individuals per publication and 33.46 percent of the publications as an indication of global collaboration which depicts moderate global interaction. It is important to note that 70 of the documents were single authored with most of them being multi-authored.

With the document type, the dataset consisted mainly of original research articles (n = 1,119), reviews (n = 89) followed by a small portion of early access articles (n = 80), conference papers, and retracted publications. The entry to this composition conforms to the inclusion criteria determined to emphasize the peer-reviewed and impactful scholarly production with the relation to the field.

Annual Scientific Production (2005–2025)

The longitudinal percent wise distribution of publication between the years 2005 to 2025 indicates a significant and adequate increase of scholarly work on artificial intelligence (AI) applications of online purchasing behaviour (OPB) as shown in figure 2. The research encompassing the time between 2005 and 2015 provided relatively low research activity as the number of publications produced annually was between 5 and 17 documents and showed a relatively low level of AI integration into the spheres and phenomena of consumer behavior and e-commerce.

The trend is notable after 2016 and started with only 36 articles in 2017, 77 articles reported in 2019, and 85 in the year 2020. This is in response to the increasing popularity of machine learning, recommender systems, and early forms of chatbots in online shopping.

The greatest period of development has been estimated to take place in the ranges of those four years, 2020 -2024, as the numbers of publications will increase in 2021 to 141 and reach 275 articles in 2024, representing 95 per cent growth over four years. Such growth is consistent with world trends in commercialization of AI, digital acceleration due to COVID-19, and the spread of AI, deep learning, NLP, and generative AI in retail systems.

Incomplete indexing could be the reason why there is a slight decline in 2025 (n = 194) but it could as well be the result of incomplete indexing at the time of data retrieval. On the whole, the given tendency exemplifies the compound annual growth rate (CAGR) at 16.59%, which is clear evidence of the rapid development and the extension of interest in the field.

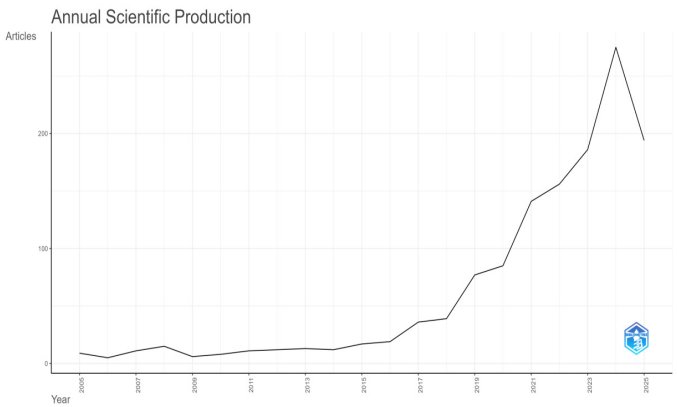

Figure 2. Annual scientific production of publications.

Trend Topic Analysis (2005–2025)

The trend topic analysis, derived from author keywords across 1,327 publications, offers insights into the chronological emergence and maturity of key themes in AI applications to online purchase behaviour. High-frequency terms, their first quartile (Q1), median and third quartile (Q3) years are summarized in figure 3, which allows us to track the growth, stabilization and topicality of research trends over 20 years.

The research in the early period (2005 - 2014) was dominated by multiagent systems, fuzzy logic, and semantic web and indicates early AI techniques and ontological frameworks in recommender systems. These subjects have since fallen out of fashion, which is expected to move away towards the data driven model.

Such topics as sentiment classification, social networks, collaborative filtering, and data mining have grown between 2015 and 2020, which marks the transition of the field to the behavioral analysis and network-based personalization models. It is also interesting to note that recommender system (frequency = 122) and consumer behaviour (frequency = 20) itself retained its relevance during several time frames disclosing the philosophical and long-term importance of these two concepts in OPB research.

An evidently increased speed of AI evolution is observed after 2020. The phrases such as big data (Q1 = 2020), deep learning (Q1 = 2021), chatbot (Q1 = 2022), task analysis, and sentiment analysis confirm the tendency towards the textual data, automation, and real-time personalization. At the same time, the topics in the spotlight in the same period, e-commerce (frequency = 219), machine learning (213), and artificial intelligence (115) make up the focus of the area of interest.

New themes that have developed during the 2024 - 2025 period are optimization, purchase intention and adaptation models, and they reflect the shift in more cognitive modeling, real-time in situ decision making and personalization of customer engagement strategies. It is worth noting that electronic commerce is one of the good late-stage keywords (Q1 = 2023, Q3 = 2025) and is confirming that the sector is undergoing a constant remodeling through AI tools. In summary, the trend topic indicates a shift where infrastructure-level technologies to behavioral and intelligent systems (e.g., NLP, personalization, sentiment) within the last couple of years reflect shift towards trust, optimization and cognitive intent prediction to adapt to the next-generation commerce platform.

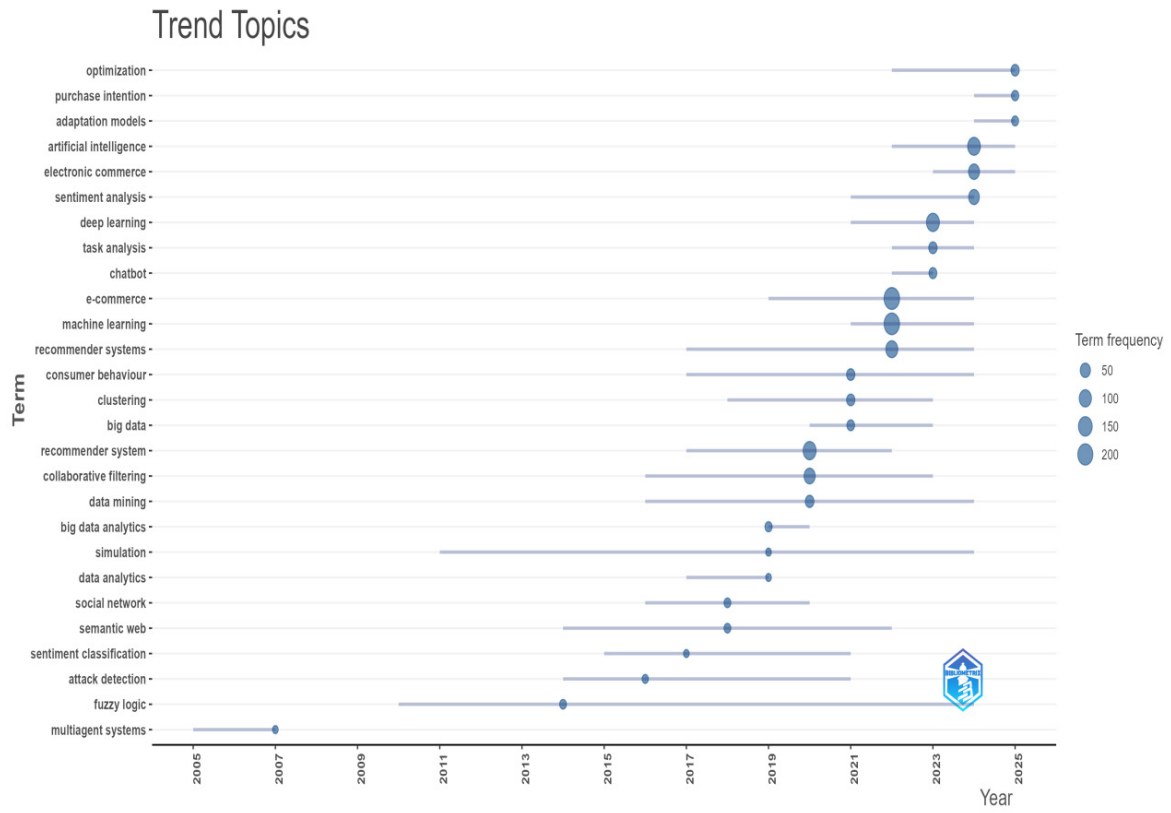

Figure 3. Trend topic analysis (2005–2025): Keyword frequency and publication timeline.

Most Relevant Authors

Figure 4 shows the top 10 of most productive scholars that have contributed to the domain of research in artificial intelligence (AI) on online purchase behaviour arranged by the number of published documents in 2005-2025. The analysis takes into consideration the absolute number of articles and fractionalized authorship which corrects against co-authorship, the fractionated attribution. LI Y turns out to be the most prolific author that also has a fractionalized score indicating high levels of collaboration and multi-author input (15 publications, 3.85). Likewise, YANG Y has 11 publications but is ranked first in fractionalized contribution (3.91), an aspect that implies a more central authorship position in comparison to publications. The other high ones are LIU Y who produced 9-10, and ZHANG J and GUPTA S with the same amount of articles, where all of them have fractionalized contributions that are above 2.0 which implies that they take part in research that requires collaboration. The participation of LI X, ZHANG Y, and CHEN L also demonstrates good depiction of academic professionals belonging to Chinese and East Asian universities, a fact agreeable with regional domination of AI research, namely, in e-commerce and recommendations systems. It is also interesting to note that KIM J also includes the top ten indicators of geographical involvement outside China and India.

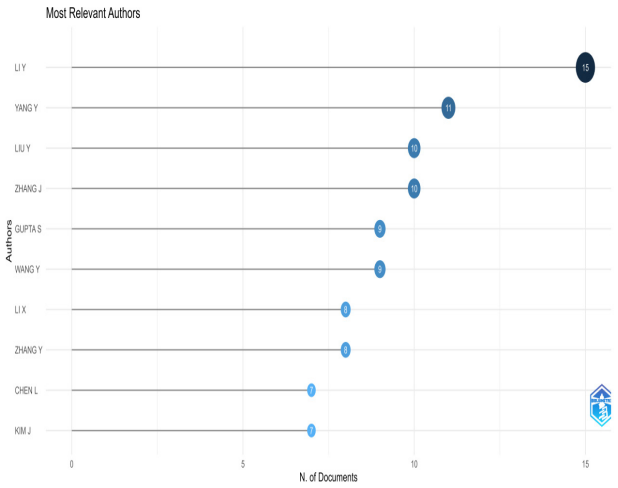

Figure 4. Top 10 most relevant authors ranked by number of publications and fractional authorship scores.

Most Relevant Sources

Through source analysis as presented in Table 3 source analysis, the top ten journals that publish widely on applications of artificial intelligence (AI) on the online purchase behaviour between 2005 and 2025 are revealed. The most prolific outlet is the IEEE Access with 106 publications as it specializes in applied computer science, AI systems, and interdisciplinary commerce technologies. Thereafter, Expert Systems with Applications (59 articles) proves to be in the spotlight in the publication of research studies associated with intelligent decision making tools and machine learning in the e-commerce domain. Other journals at the crossroads between technology and consumer studies are also quite visible in this list, including Journal of Consumer Behaviour (52 articles), Journal of Retailing and Consumer Services (29), and the Journal of Theoretical and Applied Electronic Commerce Research (29) journals, pointing to the behavioral, experiential and psychological aspects of AI adoption in online shopping. In the meantime, the journals that deal with core information systems and decision sciences such as Decision Support Systems (29), Knowledge-Based Systems (28), and Engineering Applications of Artificial Intelligence (34) reflect a methodological focus on optimisation, intelligent systems, and algorithmic modelling in digital retail. Electronic Commerce Research and Electronic Commerce Research and Applications are only additional evidence of the increased attention to the platform design and recommendation systems as well as AI-based purchase pre-representation models.

The variety of journals in various fields engineering, computer science, business, and psychology indicate that the field is very interdisciplinary and this supports that incorporation of AI in online consumer behavior goes beyond established disciplinary lines.

Table 3. Top 10 most relevant publication sources by number of articles on AI and online purchase behaviour (2005–2025).

Ranking	Sources	Articles
1.	IEEE Access	106
2.	Expert Systems with Applications	59
3.	Journal of Consumer Behaviour	52
4.	Electronic Commerce Research and Applications	35
5.	Electronic Commerce Research	34
6.	Engineering Applications of Artificial Intelligence	34
7.	Decision Support Systems	29
8.	Journal of Retailing and Consumer Services	29
9.	Journal of Theoretical and Applied Electronic Commerce Research	29
10.	Knowledge-Based Systems	28

Country Collaboration Analysis

Figure 5 presents the international collaboration map highlights strong research connections on the field of artificial intelligence and online purchase behaviour. The greatest bilateral ties are found between China and the USA,

China and Australia, India and the United Kingdom, and Singapore and Korea and Japan depicting a close academic tie among Asia, North America, and Oceania. Remarkably, India had high-frequency affiliations with nations such as Malaysia, UAE, and Saudi Arabia as the evolving economies that encapsulated South-South research union in scholarly pursuits. On the same note, China/Vietnam, and USA Singapore alliances show expanding joint work in the field of AI-related consumer technology. Conversely, low collaboration scores (e.g. USA-Canada, Chinese-USA) can be indicative of competitive rather than co-authored publications, or, data asymmetry.

These results indicate an international research network that is divided into various countries depending on the number of publications and the cooperation impact given higher countries to the west, and the dominance of the Asian countries would generate the research contribution in the post-war decade. Nevertheless, Africa and Latin America continue to be underrepresented, which may mean that the participation of diverse and inclusive international research is missing.

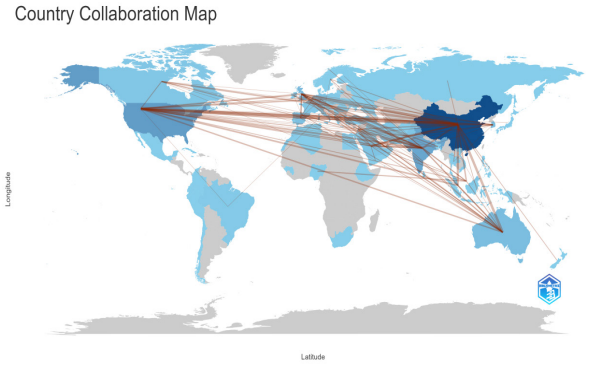

Figure 5. Country co-authorship map indicating the strength of research collaborations in AI and online purchase behaviour research (2005–2025). Line thickness represents collaboration frequency.

Most Relevant Countries

Table 4 shows 10 most productive countries about the research related to the applications of artificial intelligence (AI) in online purchase behaviour in the period 2005-2025 according to the sum of citations (TC) and the article impact. China dominates in volume in terms of number of citations (TC = 7,994), and number of publications which testifies to the fact that China is leading in AI driven e-commerce innovation. Nevertheless, the USA, with an inferior total volume (TC = 4,233) presents a substantial average citation impact (38.5 per article) that indicates a greater amount of international visibility and influence. Remarkably, Germany (Avg. = 52.7) and Australia (Avg. = 67.2) excels in terms of impact per article (not number of articles) qualitative contribution whereby the average citations per article should be employed as the measurement unit, which is the point being communicated by this. The city-state of Singapore, in particular topped the average citation score (105.1), perhaps due to a preoccupation with smart nation concepts and digital infrastructure. India (TC = 3,035; Avg. = 24.1), the United Kingdom (Avg. = 37.9), and Malaysia (Avg. = 30.6) are other important contributors and all of them signify the emerging academic interest in personalized commerce, recommender systems, and consumer analytics whether in developing or developed markets. These statistics indicate that although Asian nations have more in terms of numbers, Western and developed regions tend to be more productive in terms of citation density per article possibly owing to well established academic networks, collaborative grants and established journal presence.

Table 4. Top 10 most relevant countries

Country	TC	Average Article Citations
CHINA	7994	15.60
USA	4233	38.50
INDIA	3035	24.10
GERMANY	2160	52.70
AUSTRALIA	1948	67.20
UNITED KINGDOM	1590	37.90
SINGAPORE	1366	105.10
SPAIN	1308	32.70
KOREA	947	17.50
MALAYSIA	703	30.60

Network Visualization of Author Keywords

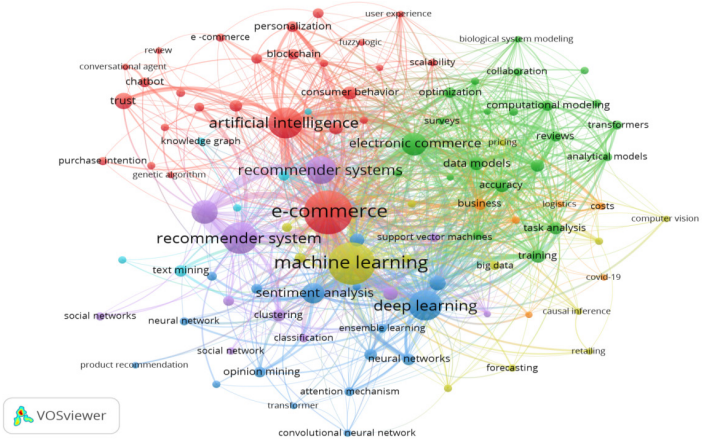

Figure 6. A network analysis of keywords co-occurrence.

Table 5 Main clusters of keywords based on co-occurrence

Cluster	Term	Keywords	Theme
Cluster 1	26	Artificial intelligence, artificial intelligence (ai), blockchain, chatbot, chatbots, consumer behavior, consumer behaviour, conversational agent, decision making, e-commerce, fuzzy logic, genetic algorithm, human-computer interaction, matrix factorization, personalization, privacy, purchase intention, recommendation, review, scalability, security, semantic web, systematic literature review, trust, user experience	AI and Trust in Digital Commerce
Cluster 2	22	Accuracy, adaptation models, analytical models, biological system modeling, Collaboration, computational modeling, data models, electronic commerce, Fraud, graph neural networks, large language models, Measurement, Optimization, predictive models, real-time systems, reinforcement learning, Reviews, social networking (online), Surveys, task analysis, Training, transformers	Computational and Modeling Frameworks
Cluster 3	17	Attention mechanism, bert, convolutional neural network, deep learning, ensemble learning, feature extraction, graph neural network, natural language processing, neural network, neural networks, opinion mining, product recommendation, semantics, sentiment analysis, social media, transfer learning, transformer	NLP & Sentiment-Driven AI
Cluster 4	13	Big data, big data analytics, causal inference, computer vision, cross-border, e-commerce, dynamic pricing, Forecasting, machine learning, fraud detection, predictive analytics, Pricing, random forest, retailing	Big Data & Forecasting
Cluster 5	11	Classification, Clustering, collaborative filtering, data mining, machine learning algorithms, recommendation system, recommender system, social network, social networks	Collaborative Filtering and Networks
Cluster 6	6	Customer satisfaction, knowledge graph, online reviews, product reviews, recommendation systems, text mining	Consumer Satisfaction & Review Mining
Cluster 7	6	Business, Companies, costs, covid-19, feature engineerin, logistics	Business Operations & Logistics

Table 5 of co-occurrence cluster analysis of keywords established seven key thematic areas that present intellectual terrain in the topic of AI applications in online purchase behaviour (OPB).

Cluster 1, AI and Trust in Digital Commerce, sums up the studies that analyze the effect of an AI technology such as chatbots and recommender systems on consumer trust, privacy, and personalization. Although they become more and more common, issues related to ethical use of AI, algorithmic discrimination, and accountability are emerging insufficiently. Research in the future should be directional as it should focus on the development of explainable and fair AI models that would entrench consumer trust.

Cluster 2, called the Computational and modeling Frameworks centers around the predictive algorithms, real time systems, reinforcement learning and transformer models. These technical frameworks are important, although unlike most of them, they are not readily interpretable in a real-time environment commerce platform. Scientists, therefore, need to seek to create a hybrid model whose accuracy and ease of design and immediate variable response are held in a reasonable equilibrium.

Cluster 3, NLP and Sentiment-Driven AI, will concentrate on the involvement of deep learning, sentiment analysis, and NLP in the capture of the opinion of consumers. Nonetheless, emotion-sensitive AI and multi-lingual sentiment models are not very common. Future work has the possibility to improve the process of cross-cultural sentiment personalization through emotion AI and transfer learning.

Cluster 4, Big Data and Forecasting, indicates that AI was used to detect fraud, price dynamically and predict in retail. The use of real-time data feeds combined with AI to enable a customized approach of fair pricing policies is new. Further research would combine the AI-driven pricing tools, which are dynamic and behavior-sensitive.

Cluster 5, Collaborative Filtering and Networks, describes recommender systems based on social networks. These are user-oriented and based on similarity predominantly, though they tend to be caught up in a filter bubble trap or over-personalization. It is important that a variety of bias resistant filtering models are created in e-commerce.

Cluster 6, Consumer Satisfaction and Review Mining, represents topics in the field of mining online reviews and customer feedback areas with the help of AI. There is an evident gap in the long-term satisfaction measurement and after-sales sentiment analysis. The research could be continued through studying a longitudinal learning model that would adjust itself along the time to enhance retention of customers.

Lastly, Cluster 7, Business Operations and Logistics, includes research that centers on AI assistance when faced with a disruption (e.g, COVID-19), logistics, and operational expenses. Few studies have been done on the implementation of AI in sustainable logistics or cross border e-commerce. AI-green projects and intelligent optimisation of delivery are also avenues of the future.

Overlay Visualization of Author Keywords

Overlay visualization of author keywords As illustrated in Figure 7, overlay visualization of author keywords offers a time dimension to the co-occurrence network, which demonstrates the time course of essential topics during the duration of publication. Keywords use color coding (dark blue (oldest); to yellow (newest) by their year of average publication. Such basics as e-commerce, recommender system, and machine learning come out in blue to green, as they have been covered earlier in the literature and continue to be used to this day.

By contrast, the new stratum of words that have been coined during the past year or so, such as transformers, computational modeling, data models, and purchase intention are colored yellow, indicating the growing demand in model optimization and targeted behavioral assessment. It is worth noting that names like deep learning, chatbot, transfer learning and emotion recognition involve switching to green, signifying that it is being applied more in the next four years of 2020-2024. Research: Lack of modern terminology such as the one currently used in ChatGPT or generative AI may indicate a possible gap in representing the emergent bibliometric essence of the personalization tool that the LLMs provide, indicating one such field of academic research.

Research Gaps and Future Directions

The keyword co-occurrence clusters and network mapping demonstrate a number of structured research topics in the entire field of AI and online purchase behaviour (OPB). Nevertheless, despite the high coverage on the technological approaches and e-commerce strategies, there were several research gaps and emerging directions that were realised as follows:

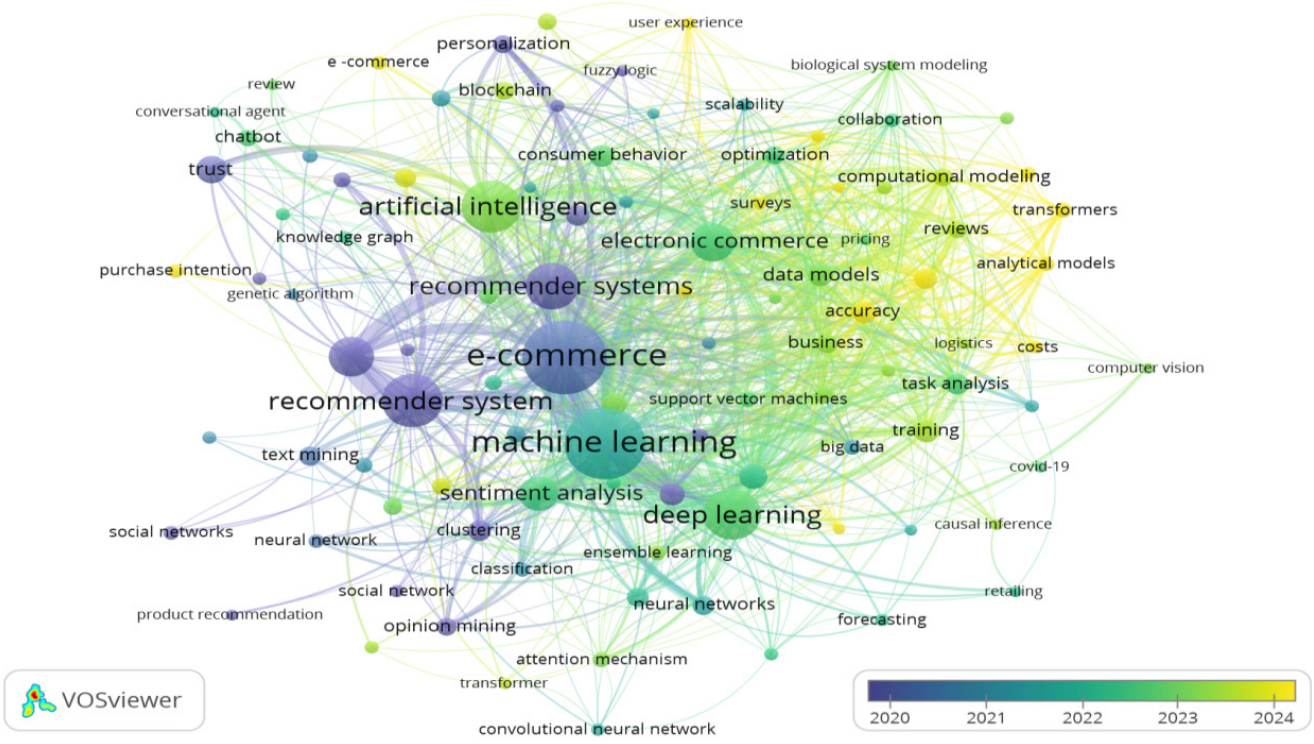

Figure 7: Overlay visualization of author keywords showing temporal trends from 2020 to 2024

Table 6. Research gaps and future directions based on thematic cluster analysis.

Cluster Theme	Explanation	Research Gaps Identified	Future Research Directions
AI and Trust in Digital Commerce	The main idea behind AI and Trust in Digital Commerce is how AI affects customer trust and a personalized buying experience.	The subject of ethical personalization, AI algorithm bias and AI transparency is understudied.	Be able to make explainable AI to allow transparency and consumer trust.
Computational and Modeling Frameworks	This includes algorithm design and near real-time trade-off during shopping, in environments.	Fewer concerns over usability, and practicability.	Fuse misty models in which precision is mixed with real-time feed-forward.
NLP & Sentiment-Driven AI	Demands that AI gives attention to the level of consumer sentiment from textual and social data.	Such sentiments very rarely are multilanguage and based on emotions.	The architects of cross lingual models and emotion artificial intelligence personalize culturally.
Big Data & Forecasting	It deals with predictive pricing and detecting fraud by the use of big data.	The uncovered issues are real time streaming data aggregation and dynamic pricing.	Obtain dynamic behavior-sensitive pricing that is optimized using AI.
Collaborative Filtering and Networks	The recommendation engines based on the likeness of social actions and users between each other are characters.	Not much thought to filter bubbles and personalization bias	Develop recommender systems with maximized diversity so as not to over-personalize.
Consumer Satisfaction & Review Mining	Determined to discover the consumer review in order to improve the services.	There is no post-purchase feedback and trends.	Learn how satisfaction and re-engagement AI are changing.
Business Operations & Logistics	Speaks about the use of AI in decisions about operations during the moments of disturbances.	The cross-border commerce sustainability and AI are poorly researched.	Develop green-AI supply chains and logistics studies in the world.

Conclusion

The given bibliometric study gives a detailed account of the dynamic nature of Artificial Intelligence (AI) in online purchase behaviour (OPB) between the year 2005 and 2025. By utilizing 1,327 records downloaded using the Web of Science Core Collection, the analysis resorted to the Biblioshiny and VOSviewer software in order to track the trend of publications, thematic groups, key actors, and future research directions.

According to the key findings, there was a sudden rise in scholarly interest after 2018, where the field of machine learning and deep learning is developing. Based on the latent themaming, the seven key research streams were founded, i.e., AI and Trust in Digital Commerce, Computational Modeling Frameworks, and Sentiment-Driven AI. Traditional notions, such as e-commerce, machine learning, and recommender systems, tend to be at the centre of interest over time, whereas new notions that refer to transformers, purchase intention, and computational modeling display dynamic interests.

In terms of geographical contributions, China, USA and India were the most prolific contributors whereas countries such as Singapore and Germany were the more prolific in terms of average citation ratio per article. Recent articles and journal reviews revealed LI Y, YANG Y, and IEEE Access as the most vigorous researchers in the sphere. Nonetheless, the overlay visualization and co-occurrence network revealed a number of under-researched areas, including LLM-augmented conversational AI, personalization explainability, green-AIs logistics, and cross-border consumer analytics.

On the whole, the article provides evidence of a change of ground in the algorithmic design to consumer oriented AI applications that involve trust, fulfillment, and dynamic decision-making. These realizations provide an intellectual and visual narrative to aid researchers and practitioners who may want to implement AI in digital commerce safely.

Limitations

Despite the crucial insights that have been revealed in the study, there are two aspects to which the study is restricted. It is restricted to the Web of Science Core Collection and the relevant studies may be missed on other databases such as Scopus or IEEE Xplore. Findings can be influenced by keyword selection and field codes and may be limited by thematic scope. Articles disregarded all non-English contributions as only articles in the English language were included. Moreover, new fields, such as ChatGPT or generative AI or emotion-aware systems have not been well-represented, since it is novel. Finally, the use of biblioshiny and VOSviewer restricts the analysis to quantitative trends, which lack more far-reaching qualitative categories of consumer behavior.

Authors' contribution statement

Pooja Patel conducted the literature review, summarized the data, and took the preliminary draft of the paper; Rashmi Bansal formulated the research problem, finalized the manuscript and took it into final shape.

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Disclosure of interest

Authors declare no conflict of interest.

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DELNET-Developing Library Network, New Delhi in collaboration with BIPL has launched "DrillBit : Plagiarism Detection Software for Academic Integrity" for the member institutions of DELNET. It is a sophisticated plagiarism detection software which is currently used by 700+ Institutions in India and outside. DrillBit is a global checker that uses the most advanced technology to catch the most sophisticated forms of plagiarism, plays a critical function for students and instructors and tag on a fully-automatic machine learning text- recognition system made for detecting, preventing and handling plagiarism and trusted by thousands of institutions across worldwide. DrillBit - Plagiarism Detection Software has been preferred for empanelment with AICTE and NEAT 3.0 (National Education Alliance for Technology) and contributing towards enhanced learning outcomes in India. On the other hand software uses a number of methods to detect AI-generated content, including, checking for repetitive phrases or sentences and AI-generated writing. As part of a larger global organization GJEIS (www.gjeis.com) and DrillBit better equipped to anticipate the foster an environment of academic integrity for educators and students around the globe. DrillBit is GDPR compliant with privacy by design and an uptime of 99.9% and have trust to be the partner in academic integrity (https://www.drillbitplagiarism.com) tool to check the originality and further affixed the similarity index which is {04%} in this case (See below Annexure 17.2.7). Thus, the reviewers and editors are of view to find it suitable to publish in this Volume 17, Issue-2, Apr-Jun 2025.

Annexure 17.2.7

Submission Date	Submission Id	Word Count	Character Count
28-April-2025	4226162 (DrillBit)	6453	42847

Analyzed Document	Submitter email	Submitted by	Similarity
2.7 RoL4_Pooja_GJEIS Apr-Jun 2025.docx	poojapatel93199@gmail.com	Pooja Patel	04%

DrillBit

4 SIMILARITY %

10 MATCHED SOURCES

A GRADE

B-Upgrade (11-40%)
C-Poor (41-60%)
D-Unacceptable (61-100%)

	LOCATION	MATCHED DOMAIN	%	SOURCE TYPE
1	www.mdpi.com		1	Internet Data
2	Thesis Submitted to Shodhganga Repository		<1	Publication
3	www.bibliometrix.org		1	Internet Data
4	aanda.org		<1	Publication
5	frontiersin.org		<1	Internet Data
6	iopscience.iop.org		<1	Internet Data
7	www.iferp.in		<1	Publication
8	core.ac.uk		<1	Publication
9	Factors influencing customers change of behaviors from online bankin, by Ahmadi Danyali, Are - 2018		<1	Publication
10	www.ncbi.nlm.nih.gov		<1	Internet Data

Reviewers Memorandum

Reviewer's Comment 1: The manuscript offers a well-structured bibliometric analysis of Artificial Intelligence applications in online purchase behaviour spanning two decades (2005–2025). The use of WoS dataset, Biblioshiny, and VOSviewer provides both breadth and depth in mapping thematic clusters, keyword trends, and collaboration networks. The major contribution of the study lies in its ability to consolidate fragmented knowledge into seven meaningful clusters. That said, the paper could be enriched by providing a clearer contrast between the formative years of research (2005–2015) and the rapid growth phase after 2018. This comparison would help readers better understand the evolution of AI themes in e-commerce, such as how initial works on recommendation systems gradually expanded towards explainable AI, sentiment mining, and green logistics.

Reviewer's Comment 2: The methodology is rigorous and the visualizations are informative. The network maps and thematic clusters are presented neatly, and the inclusion of trend analysis adds value. However, at times the discussion leans more towards descriptive reporting rather than analytical depth. For example, the cluster on "AI and Trust in Digital Commerce" is well identified, but the narrative could further unpack why trust has emerged as a central theme and how it interlinks with consumer satisfaction, review mining, and personalization. A more critical reflection on these interdependencies would elevate the contribution beyond structural mapping, helping readers grasp the conceptual coherence of the field.

Reviewer's Comment 3: The paper makes a meaningful contribution by highlighting underexplored areas such as cross-cultural perspectives on AI adoption, explainable AI in consumer decision-making, and the role of AI in sustainable supply chains. The limitations are candidly acknowledged, which reflects academic integrity. To further strengthen the practical utility of the paper, the inclusion of a conceptual framework diagram that visually links the identified clusters (e.g., trust, computational modelling, NLP, consumer experience) with potential future research avenues would be beneficial. Such a figure would serve both as a synthesis of the findings and as a guide for researchers and practitioners navigating this domain.

Citation

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Conflict of Interest: Author of a Paper had no conflict neither financially nor academically.

Editorial Excerpt

The article has 4% plagiarism, which is within the accepted percentage as per the norms and standards of the journal for publication. As per the editorial board's observations and blind reviewers' remarks, the paper had some minor revisions, which were communicated promptly to the authors (Pooja and Rashmi), and all necessary corrections were incorporated as and when directed. The comments related to this manuscript are closely aligned with the theme "Artificial Intelligence Applications in Online Purchase Behaviour Research: A Bibliometric Analysis (2005–2025)" both subject-wise and research-wise. The article offers a comprehensive study of Artificial Intelligence applications in online purchase behaviour, integrating bibliometric performance analysis, keyword co-occurrence, and collaboration mapping. It effectively highlights emerging themes such as trust, personalization, sentiment-driven AI, and green logistics, while pointing towards future research opportunities After thorough reviews and the editorial board's remarks, the manuscript has been categorized and approved for publication under the "Review of Literature" category.

Acknowledgement

The acknowledgement section is an essential part of all academic research papers. It provides appropriate recognition to all contributors for their hard work and effort taken while writing a paper. The data presented and analysed in this paper by the authors (Pooja and Rashmi) were collected first handily and wherever it has been taken the proper acknowledgment and endorsement depicts. The author is highly indebted to others who facilitated accomplishing the research. Last but not least, endorse all reviewers and editors of GJEIS in publishing in the present issue.

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