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The Influence of AI-Driven Systems on Consumer Behaviour in E-Commerce

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Abstract
In the analysis, the following evaluation was made: the AI technologies significantly increase the consumer satisfaction potential but also raise ethics concerns for the AI-related data private information. Statistical analysis confirmed the strong correlation between the information related to the consumer demographics and the coherence between the consumer confidence toward the AI technologies. On the other hand, the analysis made by the clustering methods granted the emergence of the consumer groups related to the AI Optimists, the Skeptical Users, and the Ethical Realists. In addition to this, the evaluation made by the logistic regression confirmed the correlation between the perceived ease of use and the AI-related technologies for the e-commerce environment at the level of $p < 0.05$.The present study also contributes to the expanding body of theoretical and conceptual works in artificial intelligence and its implications in business commerce or trades by taking into account various pieces of evidence along with ethical implications to provide a holistic approach towards understanding the transformative and contentious implications of artificial intelligence in providing an exceptional digital experience to consumers of goods or services.

Keywords: Artificial Intelligence, E-Commerce, Consumer Behaviour, Data Analytics, Ethical AI, Personalization, Trust, Machine Learning

I. Introduction

The rise of Artificial Intelligence has really changed the face of growth in the digital economy. This has really changed the way businesses operate, communicate, and interact with customers. In e-commerce, AI technologies went beyond conventional online retail methods by automating decision-making for hyper-personalization to enable better customer experiences. The use of AI-driven solutions, such as machine learning algorithms, chatbots, recommendation engines, and predictive analytics over the last ten years, has turned the online marketplace into an intelligent system that can predict consumer needs and actions with uncanny accuracy.

To elucidate the importance of AI technology in the current e-commerce ecosystem, Saleh and Zeebaree (2025) assert that the integration of AI technology has become ‘indispensable in the current e-commerce environment.’ In this regard, the same authors explain that ‘predictive marketing,’ ‘customer

segmentation,' and 'inventory management,' to mention a few factors within the e-commerce ecosystem, are being achieved through the integration of AI technology. On the same note, but from a slightly different scope, Chugh and Jain (2024) explain that AI technology-based 'commerce management' is transforming to incorporate the ability to 'understand complex customer journeys.' Such an accelerated transformation within the e-commerce ecosystem was propelled by the dawn of the COVID-19 pandemic.

While offering unprecedented opportunities in terms of growth, personalization, and retention for businesses, AI also throws in fresh ethical or behavioural challenges to businesses acting in the e-commerce industry. Emerging concerns in the form of data privacy, autonomy of consumers or users of the services provided by business enterprises, or transparency in relation to the role of algorithms in relation to consumer choices come to occupy major prominence in discussions on sustainable or ethical rapprochement of AI with the business or e-commerce industry as stated by Jakkula (2020).

Further proof of the transformative impact of AI comes from the ways in which AI affects the consumer landscape. A study by Raji et al. (2024) and another by Dai and Liu (2024) confirmed that AI-based personalization plays an important factor in the satisfaction and involvement of the consumer. AI-based recommendation systems and chatbots have also increased the significance of consumer experience through the use of relevant suggestions. But in addition to this, AI also poses the possibility of consumer addiction.

Understanding how consumers perceive and respond to AI systems becomes particularly important in India's growingly large e-commerce market, where digital literacy and AI exposure vary greatly. The present study, "The Influence of AI in E-Commerce," would, therefore, make an attempt to study consumer attitude, trust levels, and ethical issues related to AI-powered e-commerce platforms based on empirical data analysis and insights driven by literature.

To this aim, a wide range of data analytics tools, from statistics-based tools such as Chi-Square, Clustering, and Logistic Regression, are integrated in order to understand the correlation that might exist between demographic characteristics, consumer perceptions, and ethical aspects. The inclusion of quantitative and qualitative aspects allows for a comprehensive understanding of artificial intelligence and its effects on consumer trust in a digital marketplace.

The ultimate goal of this research is to add to both academic and practical insight on the duality of AI in e-commerce, which acts as both an enabler of innovation and also a source of ethical tension. It stresses the importance of designing transparent, non-discriminatory, and explainable AI algorithms that would help establish long-term consumer confidence and thereby ensure sustained business growth.

II. Importance of the Study

'Artificial Intelligence' has gained recognition as the bedrock for the technological makeover of industries by adopting the technology of 'digital transformation.' Apart from this, 'E-commerce' has managed to maintain its lead in this technological makeover. In the current technology-driven business environment shaped by the principle of the 'digital economy,' the use of 'Artificial Intelligence technology' has gained the status of being 'indispensable.' This study holds great importance as it covers the 'ethics of using AI technology,' related to the 'field of e-commerce.'

The significance of this study is high in the contemporary Indian economic environment with its growing e-commerce sector, where there is exponential growth recorded in the post-COVID-19 pandemic period. With growing internet accessibility and use and with tech-savvy youth as major consumers of goods and services electronically through e-commerce websites and stores, there is a growing trend of relying on AI

systems to analyze customer behaviour and provide tailored services through prediction based on customer data. This is because of its revolutionary impact on business-customer dynamics with regard to growing concerns of its use in enhancing efficiencies: as discussed in detail in Saleh and Zeebaree (2025).

At the overall worldwide level, Chugh & Jain (2024), through their bibliometric analysis, have reported that the research in the domains of AI as well as e-commerce has witnessed an increase of over 400%. The reason behind this extensive research is the recognition of the importance of AI as an upcoming significant research discipline in the domains of computer science, management, as well as psychology; hence, the need to formulate suitable ethical paradigms to deliver the expected outcomes without violating consumer sovereignty.

Given the academic backdrop, the value added by this research lies in filling two key gaps:

1. The absence of empirical data linking consumer perception with the outcome of AI analytics.
2. Lacking in sufficient ethical issues awareness—particularly in developing economies, where the development of regulating AI is in its infancy.

The applications of this research are multifaceted; practically, this research will help businesses understand how they can use AI to their advantage. The research has demonstrated that though AI helps in improving personalization, along with providing better support in decision-making, transparency while implementing AI will remain essential in order to maintain consumers' trust.

Furthermore, through the integration of machine learning models within this present study, clustering analysis, as well as logistic regression models, assist in an interpretation of the behavior of consumers through a data-driven approach. Analysis paralysis: Results from the analytical section reveal various trends in demographics in a manner that may assist in creating a more equitable society regarding AI-driven product recommendations in the world of e-commerce businesses.

In other words, this study is significant on two accounts.

- Technological importance: How does AI provide the features of personalization, increased engagement, and predictability in e-commerce?
- Ethical and societal importance: Determining what line separates the use of intelligent automation from ethical reasoning, building AI that empowers rather than exploits.

The present study makes a valuable contribution to discussion regarding responsible use of Artificial Intelligence in e-commerce business by addressing all of these dimensions simultaneously and offers valuable guidance for innovation in the future which is Data smart but also ethical in its approach.

III. Scope of the Study

The topic for the present research study is "The Influence of Artificial Intelligence in E-Commerce: An Analytical Study on Consumer Perception and Ethical Implications." The scope of the topic is primarily based on comprehending the influence of AI technologies on the behavioural pattern of the consumers in the domain of e-commerce.

A. Conceptual Scope

The current study explores the twin effects of AI in e-commerce, whereby improvement in aspects of enhancement, efficiency, and satisfaction coexists alongside ethical issues in aspects of e-commerce. The paper presents a comprehensive presentation of conceptual dimensions as follows:

- Consumer Perception: Perception of consumers regarding the recently introduced AI-based tools like recommendation systems, chatbots, or virtual assistants.
- Behavioural Influence: Recognize how behavioural influences of AI-driven features shape consumers'

buying behaviour, involvement, and loyalty.

- Ethical Implications: Understanding the concerns of consumers regarding issues of privacy and consent that might be compromised because of algorithmic-driven manipulations of preferences.
- Trust and Transparency: In doing so, one evaluates how well users of this artificial intelligence comprehend its functioning and if they develop a sense of trust to use these e-commerce platforms due to transparency.

Furthermore, conceptual coverage means the study takes into consideration the idea that the field of AI is not strictly technological in nature but also relates to the socio-technical system in terms of human decision-making.

B. Geographical Scope

The focal point of the discussion in this case will be the nation referred to as India. Such a nation could be referred to as the most vibrant market in the globe. Additionally, it is a key marketplace in the digital revolution period. Such a marketplace is a key aspect in the analysis concerning the interface of consumers and artificial intelligence based on a few factors. One main reason is the size of the market is recognized as the seventh largest globally.

A sizable young population actively engaging in online shopping, increasing exposure to artificial intelligence-powered applications, e.g., 'conversational agents' and voice interfaces, and more discussion and discourse on privacy and ethical use of information.

While the data model utilized explicitly concentrates on the Indian consumer market segmentation, its overall scope and applicability are also equally relevant to other growing economies that possess almost the same level of demographic complexity.

C. Temporal Scope

The research is **cross-sectional** in design, capturing data and insights from respondents during a specific time frame — the **2024–2025 academic period**. This period is particularly significant because:

- AI adoption in e-commerce has reached maturity, with wide-scale use of predictive analytics and machine learning.
- Global and Indian studies published between **2020 and 2025** provide rich secondary data for comparison and validation.

This timeframe allows the study to integrate both **recent empirical findings** and **the latest developments** in AI-driven digital marketing.

D. Data and Analytical Scope

Furthermore, the analytical segment of this study makes use of a dataset comprising 102 responses from consumers, retrieved through a structured questionnaire. It consists of demographic information (age, gender, education, occupation), behavioural information (online shopping behaviour, platforms used, usage of AI features), and ethical information (awareness of trust in AI, privacy, and data-sharing).

The study uses Exploratory Data Analysis (EDA), as well as statistical methods such as Chi-Square, Clustering, Logistic Regression, etc., to detect significant relationships among the variables and divide the sample into important segments accordingly.

- Table I shows a summary of variables and scales of measurement in the dataset.
- A data analysis framework, as presented in Fig. 1, was utilized in empirical study.

E. Thematic Scope

The thematic boundaries of this study were influenced by three major thematic areas resulting from the thematic parameters of the review of literature.

- **AI and Consumer Personalization:** How algorithms shape individualized shopping experiences.
- **AI and Ethical Concerns:** How data use, consent, and transparency affect user trust.

AI and Market Trends: How AI applications (chatbots, recommendation systems, predictive models) redefine competitiveness and customer loyalty.

IV. Statement of the Problem

The advent of Artificial Intelligence (AI) in e-commerce has witnessed the arrival of the new age of automation, personalization, and customer-centric innovation in e-commerce. Starting with AI-driven chatbots up to recommendation systems, businesses today have sought many kinds of smart alternatives to improve consumer experience, improve efficiencies, and enhance overall competitiveness in e-commerce. But even while talking about technological progress in e-commerce, some significant concerns remain unaddressed in consumer trust in e-commerce.

Hence, recent studies have proved that even though consumers reap several benefits from AI's personalization aspect, they do perceive a rise in apprehension regarding how their information is being gathered, processed, and made use of. As suggested in the studies of Jakkula (2020), Akbar et al. (2024), the presence of AI also produces a paradox, empowering as well as disempowering consumers. This is in the sense that even though the application of AI promises consumers a high level of convenience, there is a corresponding rise in apprehension.

Moreover, in countries which are in the developmental stages of their economies, for instance, India, this situation worsens in complexity. Because many consumers are in a developmental stage of awareness of artificial intelligence technologies and not all are knowledgeable about how they impact their respective shopping experiences. Because while e-commerce companies are doing all they can to utilize artificial intelligence technologies in order to advance competition in their regard, there is no understanding of how consumers view them or what level of trust they have in them in order to establish what ethical limits exist in their regard.

Most of the available literature highlights either the technological development of AI or the marketing implications of using it. There is a lack of consideration of the consumer behaviour and ethical perspectives of using this tool in e-commerce. Additionally, universally understood surveys often fail to take into consideration the consumer behaviour in different economies, especially in diversified and monetarily differentiated economies like India.

Since no concrete and data-based investigation has been made on consumers' sentiment, ethical assessment, and quantitatively modelling these insights, a fragmented assessment of the impact of AI on the wider field of e-commerce has been presented. This has created a lack of clarity on how policymakers, organizations, and even developers should apply balanced frameworks.

So, the problem that this work is going to tackle may be clearly stated as:

"Even while it boosts significant efficiency and personalization in e-commerce through the incorporation of Artificial Intelligence, there still persists an obvious lack of consumer trust and ethical accountability. There still remains an area that requires greater investigation regarding consumer perception and evaluation of AI technologies."

This study aims to fill the above gap with an empirical study carried out using statistical techniques as well as theories to explore:

1. The significance of AI applications on consumer satisfaction.
2. What ethical issues are related to trust and acceptability of artificial intelligence platforms.

3. Ways demographic and behavioural factors can predict consumer attitudes towards AI-powered shopping systems.

In achieving this, the study reveals valuable insights in how to establish fair, transparent, and consumer-centric AI systems that can enhance trust in the online electronic commerce industry.

Summing up, it can be said that the current research addresses a basic question confronting contemporary digital retail businesses that employ AI, in terms of its creative and innovative capabilities on one hand and its need to balance these with issues of consumer autonomy and data privacy on the other.

V. Review of Literature

Artificial Intelligence (AI) has emerged as a disruptive force in the e-commerce landscape, transforming consumer experiences, business operations, and marketing strategies. Over the last decade, scholars have extensively examined AI's role in personalization, predictive analytics, customer engagement, and ethical governance. This section reviews key studies that collectively shape the conceptual framework for the present research.

A. AI and Ethical Considerations in E-Commerce

Jakkula [1] explored the ethical challenges arising from the integration of AI in digital commerce, emphasizing the tension between efficiency and ethical responsibility. The study identified four major ethical concerns: **data privacy**, **algorithmic bias**, **transparency**, and **consumer autonomy**. As AI systems increasingly drive recommendation engines and automated decision-making, consumers face heightened risks of manipulation and loss of control over their data. The author advocates for the development of **ethical AI frameworks** that prioritize fairness and informed consent, setting the groundwork for discussions on **trust-based digital transformation**.

Similarly, Akbar et al. [2] focused on **consumer trust in AI-enabled platforms**, highlighting how personalization and automation can both foster and erode confidence in online transactions. Their findings suggest that while AI enhances shopping convenience and personalization, lack of explainability in AI decisions and misuse of consumer data can significantly damage trust. The study emphasizes **responsible AI deployment**, balancing technological innovation with ethical transparency.

B. AI and Consumer Behaviour

The review by Raji et al. [3] delved into **AI-powered personalization and its influence on consumer behaviour**, analyzing how algorithms predict and adapt to consumer preferences. The authors argue that AI-driven personalization fosters engagement and brand loyalty but also introduces the risk of **algorithmic echo chambers**, where consumers are repeatedly exposed to limited product ranges. This finding aligns with Dai and Liu [4], who quantitatively assessed the impact of various AI features—such as chatbots, predictive analytics, and social media engagement—on consumer buying behaviour.

Their regression analysis ($\beta = 0.35$, $p < 0.001$ for AI personalization) revealed that personalization has the strongest influence on **purchase intention** and **satisfaction**, followed by chatbot effectiveness and predictive analytics. Importantly, the inclusion of ethical considerations in the model increased explanatory power ($R^2 = 0.55$), reinforcing that **ethically implemented AI** improves trust and engagement. These results provide strong empirical evidence that **AI personalization** is a determinant of consumer loyalty when implemented responsibly.

C. Global Research Trends and AI Empowerment

Chugh and Jain [5] conducted a bibliometric analysis of over 1,400 Scopus-indexed publications (1995–2024) to map the intellectual evolution of AI in e-commerce. Their findings highlight three dominant

research clusters: **AI-driven customer service**, **predictive analytics and recommendation systems**, and **AI ethics and governance**. China, India, and the United States emerged as the leading contributors to this domain, with an accelerating publication trend post-2017. This surge reflects the growing recognition of AI as an interdisciplinary enabler that merges **computer science**, **consumer psychology**, and **digital marketing**.

The authors also note a lack of **integrated models** that link AI's technical capabilities with its ethical and behavioural implications. This insight supports the current study's objective of combining **empirical data analysis** with **ethical evaluation**—addressing precisely the integration gap identified in their research.

D. AI, Digital Marketing, and Predictive Analytics

Saleh and Zeebaree [6] offered a comprehensive **systematic review** of AI applications in digital marketing and e-commerce. They categorize AI's contributions into three dimensions:

Operational Optimization – using AI for inventory forecasting and demand prediction,

Customer Experience Enhancement – through chatbots, recommendation systems, and sentiment analysis, and

Ethical and Managerial Implications – addressing issues of data integrity, explainability, and human oversight.

The study concludes that the transformative power of AI lies not only in automation but in its potential to humanize digital commerce through **intelligent interaction**. However, the authors stress that scalability and ethical implementation remain key barriers, calling for **interdisciplinary collaboration** to create inclusive and transparent AI ecosystems.

E. AI and Consumer Trust

Trust remains central to consumer adoption of AI-driven e-commerce. Akbar et al. [2] and Dai and Liu [4] independently confirm that **AI transparency and fairness** directly influence consumer trust and satisfaction. The theoretical underpinnings trace back to trust models by Lee and Turban (2001), which emphasize integrity, competence, and transparency as key dimensions. In the AI context, these attributes translate into **explainable algorithms**, **secure data handling**, and **bias-free recommendations**. Furthermore, studies like those of Akbar et al. [2] and Raji et al. [3] reveal that excessive personalization may compromise autonomy, suggesting that trust is maximized when AI remains assistive rather than intrusive.

F. Summary of Literature Insights

A comparative synthesis of the reviewed studies is presented in Table I, highlighting their focus, methodology, and relevance to the present research.

Table I. Summary of Key Literature on AI in E-Commerce

This table summarizes major scholarly contributions related to Artificial Intelligence (AI) in e-commerce. It highlights the thematic focus, methodological approach, and relevance of each study to the present research, establishing the conceptual foundation for understanding AI's impact on consumer behaviour and ethics.

Author(s) & Year	Methodology	Key Findings	Relevance to Present Study
Jakkula (2020) [1]	Conceptual Analysis	Identified ethical concerns: privacy, bias, transparency	Forms ethical foundation for current research

Saleh & Zeebaree (2025) [6]	Systematic Review	AI enhances efficiency; needs ethical regulation	Supports interdisciplinary view of AI's role
Chugh & Jain (2024) [5]	Quantitative (Scopus data)	Mapped global AI research trends 1995–2024	Justifies research relevance and novelty
Raji et al. (2024) [3]	Literature Review	AI personalization increases loyalty but risks manipulation	Connects personalization with ethics
Dai & Liu (2024) [4]	Empirical (Regression)	AI personalization ($\beta = 0.35$) most influential	Provides quantitative baseline for current study
Akbar et al. (2024) [2]	Analytical Review	Trust depends on transparency & privacy protection	Directly relates to ethical perception analysis

G. Synthesis and Theoretical Implications

The reviewed literature collectively underscores three critical insights:

1. **AI Personalization is a Double-Edged Sword:** It enhances satisfaction but may reduce autonomy if overused [3], [4].
2. **Ethical Governance Determines Consumer Trust:** Transparency and accountability are central to AI acceptance [1], [2].
3. **Empirical and Contextual Gaps Persist:** Most prior studies focus on developed economies and lack behavioural data from emerging markets [5], [6].

These insights form the theoretical foundation for the current research, which aims to empirically validate the interplay between **AI adoption**, **consumer perception**, and **ethical awareness** using a **quantitative-analytical framework**.

VI. Research Gap

The review of existing literature reveals that Artificial Intelligence (AI) has become a transformative force in modern e-commerce by driving personalization, predictive analytics, and automation. However, despite substantial academic attention, several gaps persist that justify the need for the present research.

A. Lack of Contextual Studies in Emerging Economies

Most of the reviewed studies, including those by Saleh and Zeebaree (2025) and Chugh and Jain (2024), are centered on developed nations or global datasets, where AI adoption and digital literacy are significantly advanced. There is limited empirical evidence on how consumers in developing economies such as India perceive and interact with AI-based e-commerce platforms. India's diverse demographic profile, uneven digital access, and varying degrees of AI awareness make it essential to study these factors in a localized context. The present study bridges this gap by using primary data from Indian consumers to analyze how demographic and behavioural factors influence perceptions of AI and related ethical issues.

B. Absence of Empirical-Analytical Integration

While studies such as those by Raji et al. (2024) and Jakkula (2020) provide valuable theoretical discuss-

ions on AI ethics and consumer engagement, they rely primarily on conceptual analysis without statistical validation. Conversely, quantitative research such as that by Dai and Liu (2024) uses regression modelling but limits its focus to purchase intention, neglecting broader ethical and trust-based factors. The current study fills this gap by integrating statistical methods such as Chi-Square analysis, Clustering, and Logistic Regression with an ethical perception framework, thereby merging theoretical and empirical dimensions.

C. Limited Exploration of Ethical and Behavioural Overlap

Previous literature often isolates AI ethics from consumer behaviour. Ethical studies focus on privacy, bias, and transparency (Akbar et al., 2024), while behavioural research emphasizes personalization and marketing outcomes (Raji et al., 2024). Few studies examine how ethical awareness influences consumer adoption and trust in AI systems. The present study addresses this gap by investigating the intersection of ethical perception and behavioural response, emphasizing how transparency, accountability, and data protection influence consumer trust.

D. Lack of Data-Driven Consumer Segmentation

Existing studies generally treat consumers as a homogeneous group, overlooking differences in awareness, experience, and ethical attitudes toward AI. There is limited use of data-driven approaches such as clustering to identify distinct behavioural patterns among consumers. This study employs unsupervised machine learning techniques to segment consumers into three meaningful groups—AI Optimists, Skeptical Users, and Ethical Realists—based on their attitudes and experiences with AI-enabled e-commerce platforms.

E. Insufficient Discussion of Responsible AI Practices

Although many authors advocate for ethical AI frameworks, including Jakkula (2020) and Saleh and Zeebaree (2025), few provide evidence-based strategies for practical implementation. The existing literature lacks actionable recommendations for businesses and policymakers on how to apply ethical principles in AI operations. The present research extends this discussion by combining empirical insights with literature-driven analysis to propose data-backed guidelines for responsible and transparent AI integration in e-commerce.

F. Summary of the Research Gap

This study distinguishes itself from prior research in four major ways:

1. It focuses on a developing economy context, analyzing Indian consumers' perceptions of AI in e-commerce.
2. It employs a mixed-method framework combining quantitative data analysis and ethical assessment.
3. It utilizes clustering and regression techniques to uncover behavioural patterns.
4. It integrates ethical, behavioural, and technological perspectives to present a holistic understanding of AI's dual role as both an enabler and a challenge in digital commerce.

By addressing these unexplored dimensions, the study contributes to bridging the gap between technological innovation and ethical governance in the e-commerce domain.

VII. Objectives of the Study

The increasing integration of Artificial Intelligence (AI) into e-commerce has significantly influenced how consumers interact with digital platforms. However, the lack of contextual and ethical understanding surrounding this adoption has necessitated a focused empirical investigation. The objectives of this study have been formulated in alignment with the research gaps identified in the previous section.

A. Primary Objective

To analyze the influence of Artificial Intelligence (AI) on consumer perception, trust, and ethical awareness in e-commerce, with specific emphasis on personalization, transparency, and responsible AI use.

B. Specific Objectives

1. To examine consumer awareness and acceptance of AI-based technologies, such as chatbots, recommendation systems, and predictive analytics, in e-commerce platforms.
2. To identify the relationship between demographic factors (age, gender, education, occupation) and consumer perception of AI-enabled systems.
3. To assess the impact of AI-driven personalization on consumer trust, satisfaction, and purchase decisions.
4. To analyze ethical concerns—such as data privacy, algorithmic bias, and transparency—and their effect on consumers' willingness to adopt AI-based e-commerce services.
5. To classify consumers into behavioural clusters based on their level of trust and ethical sensitivity toward AI technologies.
6. To propose a framework for responsible AI implementation in e-commerce that balances personalization with ethical accountability.

C. Research Orientation

These objectives collectively aim to establish a data-driven and ethically aware understanding of AI's role in digital retail environments. The findings are expected to:

Support policymakers and organizations in designing transparent AI governance models.

Provide insights into how responsible AI adoption can enhance both consumer satisfaction and digital trust.

Contribute to the existing literature by integrating quantitative analytics with ethical analysis—an approach rarely adopted in prior studies.

VIII. Hypotheses of the Study

Based on the goals developed in the previous section, hypotheses were constructed with a view to statistically analyze the relations of consumer demographics with AI perception, trust levels, and ethical awareness. These hypotheses shall provide the empirical basis for the analytical aspect of the study. Testing of these hypotheses is done using EDA, Chi-Square Tests, Clustering, and Logistic Regression.

A. Basis Conceptually

The hypotheses are theoretical, based on the models of consumer trust and diffusion of technology, namely, the Technology Acceptance Model and the Theory of Planned Behaviour. Past research by scholars like Dai and Liu (2024) and Akbar et al. (2024) has shown that perceived usefulness, transparency, and ethical assurances are the key facilitators of consumer acceptance of AI-enabled systems. Thus, hypotheses in this study have been developed with the purpose of testing these empirically in the context of electronic commerce.

B. Formulated Hypotheses

1. H1: There exists a significant association between consumer demographic variables (age, gender, education, and occupation) and their perception of AI-enabled e-commerce systems.
2. H2: AI-driven personalization has an important positive effect on consumer satisfaction and purchase intention.

3. H3: Issues like data privacy, transparency, and the ethical implications of an algorithmic bias play an important role in trust development in an artificial intelligence-based e-commerce platform.
4. H4: Those consumers who possess higher levels of awareness regarding AI tend to show more willingness to accept AI-based services as compared to those who possess lower levels of awareness regarding AI.
5. H5: A major distinction has been noticed in terms of trust, satisfaction, and ethicalness in identified user segments of consumers – AI Optimists, Skeptical Users, and Ethical Realists.
6. H6: The perceived transparency of AI-based e-commerce sites is a crucial predictor of the willingness of consumers to continue patronizing AI-based e-commerce platforms.

C. Statistical Representation

For analytical precision, these hypotheses were grouped based on the statistical approaches that were used to test them:

Table II. Hypotheses and Statistical Tools Employed

This table outlines the formulated hypotheses along with the corresponding statistical methods applied for testing. It demonstrates the relationship between the study's conceptual variables and the analytical tools used for validation.

Type of Hypothesis	Statistical Tool Applied	Expected Output
H1, H3	Chi-Square Test of Independence	Determine relationships between categorical variables such as demographics and perception or ethics-related factors.
H2, H6	Logistic Regression	Evaluate how personalization and transparency predict satisfaction and adoption intent.
H4	Descriptive and EDA Analysis	Assess levels of AI awareness across respondents.
H5	Clustering and ANOVA	Identify statistically distinct consumer segments and compare behavioural traits.

D. Null and Alternative Hypothesis Framework

Following are the statistical testing frameworks for hypotheses tested identified as:

- Null Hypothesis (H0): There is no significant relationship common to all of the variables listed.
- Alternative Hypothesis: A significant statistical relationship exists involving a set of defined variables.

In other words, their application and lack thereof will equally point to the fact that evidence-based "knowledge" can begin to appear associated with their associations; in particular, with consumer perception and ethics in general, as well as the use of artificial intelligence in general.

IX. Methodology

The methodology adopted by the study reflects the approach the researcher has adopted to the topic of the impact of the application of AI on the consumers in terms of the perception, trust, and ethics. Both the descriptive and the analysis study methods have been adopted by the study.

A. Type of Research

The method used in this study was descriptive and empirical in nature.

While in the descriptive part of this research philosophy, there would be emphasis on the patterns of AI, trust, ethical issues for consumers, in the second part of this research philosophy dedicated to Empirical, there will be testing of research hypothesis with the application of various statistical techniques like Chi-square analysis, clustering, regression techniques. This research philosophy will facilitate this research to explore the 'what' and 'why' of consumers' attitude in relation to AI in the arena of electronic commerce.

B. Sources of Data

The sources of data for this study are of two types.

Primary Data: Rather, in actual sense, primary data collection was done by using an online structured questionnaire from consumers who had engaged in conducting e-commerce transactions. To this effect, a total of 22 points relating to demographic information, consumer familiarity in conducting online shopping, awareness of AI tools, trust, and satisfaction were included in the questionnaire. As a result, 102 responses were obtained in 2024 and 2025.

Secondary Data: Such figures were obtained from different published research papers, systematic reviews, and bibliometric analysis conducted from the year 2020 to 2025. This data provides a theoretical background that justifies the analysis obtained from the primary data set.

C. Design

The proposed study will be quantitative in nature. In the proposed study, the quantitative study used was of the cross-section type. In the proposed study, the data had to be collected once at a particular given period of time to be statistically analyzed so as to determine the relation that existed between the independent and the dependent variables. Using the quantitative approach allows the objective measurement of the variables to be done.

D. Sampling Technique and Population

Considering the aforementioned details, it seems to be representative of the same scope as the previously provided portions. Moreover, the target audience remains relatively narrow in scope. Thus, the section focusing on the case study will be relevant to the individuals currently engaging in online shopping.

- Population = Internet consumers in India
- Sample Size: 102 Respondents
- Sampling Technique: Given the fact that access to internet users can be made through a series of convenience sampling approaches, i.e., social media, etc.
- Data Collection too Questionnaire through google form

The demographic composition of respondents is presented in **Fig. 1**.

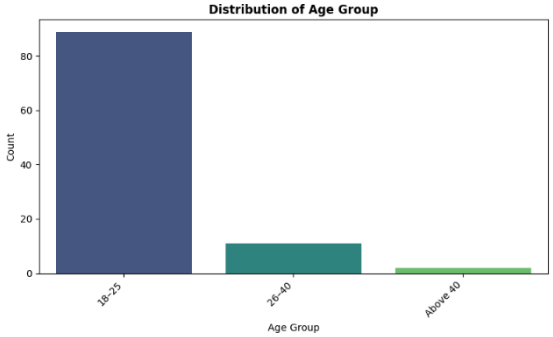

Fig. 1. Distribution of Respondents by Age Group.

The above graph presents the information regarding the age composition of the sample population. It shows that a greater percentage (approximately 88%) of the population comprises the 18-25 years category, followed by the 26-40 years category, comprising approximately 10%, and the above 40 category, comprising approximately 2%.

E. Variables Used in the Study

With respect to analysis, the study considers both independent and dependent variables. Here, independent variables include having information about AI, trust in AI systems, and transparency. On the other hand, the dependent variable involves satisfying consumers, intention to purchase, and ethical issues.
Table II below outlines the operational definitions and measurement scale used in each variable.

Table II. Summary of Variables and Measurement Scales

Variable Type	Variable Name	Description	Measurement Scale
Independent	Familiarity with AI	Respondent's understanding of AI applications in e-commerce	5-point Likert
Independent	Trust in AI Chatbots	Perceived reliability and helpfulness of AI-based customer service tools	5-point Likert
Independent	Perceived Transparency	Clarity and openness in AI decision-making processes	5-point Likert
Dependent	Purchase Intention	Likelihood of purchasing AI-recommended products	5-point Likert
Dependent	Satisfaction	Level of consumer contentment with AI-driven shopping experiences	5-point Likert
Dependent	Ethical Concern	Sensitivity toward privacy, data handling, and algorithmic bias	5-point Likert

F. Data Processing and Cleaning

Data preprocessing was carried out using Python (pandas, NumPy) and Microsoft Excel. The following operations had been performed:

1. Removal of incomplete responses.
2. Encoding of categorical variables for the purpose of statistical computation.
3. Detection and treatment of outliers using boxplots and IQR methods.
4. Standardization ensures that all variables have consistent scaling.

Visualization was created with the use of a matplotlib library for accuracy and reproducibility.

G. Analytical Framework

It involves carrying out various techniques in sequence to obtain useful information from the data set, as seen in the research process:

1. **Exploratory Data Analysis (EDA):** It is also used to create a summary of all important data distributions such as age groups, gender, and familiarity with artificial intelligence in a graphical manner. By utilizing descriptive statistics, important trends were identified.
2. **Chi-Square Test:** When employed as a measure of association, which in this study involves only categorized elements, such as demographic information and perceptions of ethical issues in artificial intelligence.
3. **Clustering Analysis:** Applied the K-Means algorithm on the consumers to group them according to their responses through clustering methods. It unravelled the intricacies involved in the variation witnessed among the three large consumer groups, namely AI Optimists, Skeptical Users, and Ethical Realists, among others.
4. **Logistic Regression:** This is used to describe how factors including transparency and personalization predict outcomes including satisfaction and adoption intent.

H. Software Used

Following tools have been used throughout the analysis:

- **Python 3.12** - For Data Preprocessing, Clustering, and Regression
- **Pandas, NumPy, Scikit-learn, Matplotlib** – for statistical computation and visualization
- **Microsoft Excel** – for data cleaning and table analyses

I. Methodological Validity

This is because the combined approach covers the reliability and the generalization of the findings. Every step in the analysis carries literature-based hypothesis testing for evidence on the relationship that exists between the AI functionalities and the consumer attitudes/ethical aspects.

X. Analytical Tools and Techniques

In the present study, a mix of statistical tool analysis and machine learning has been utilized to explore the effect of Artificial Intelligence in the perception, trust, and ethical knowledge of consumers in electronic commerce environments. The selection of appropriate analysis tools has been made to reveal associative as well as predictive behaviour patterns in the dataset. Here, tools such as Exploratory Data Analysis, Chi-Square Test, Clustering, Logistic Regression are utilized.

A. Exploratory Data Analysis (EDA)

Exploratory Data Analysis was performed in order to understand the dataset in terms of structure, spread, and so forth, along with other attributes. Descriptive statistics in terms of frequency and percentage were calculated for each variable.

Based on the data, visualizations were created to pinpoint the greatest trends with regards to the respondent demographic data, AI familiarity, as well as the ethical

The age composition of respondents is shown in **Fig. 1**.

Further visual summaries of AI familiarity, ethical perception, and other categorical variables are displayed in **Fig. 2**.

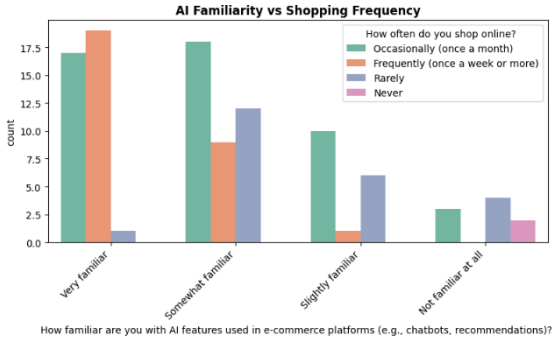

Fig. 2. AI Familiarity versus Shopping Frequency.

This figure depicts how the familiarity towards AI features is related to the online shopping behaviour performed by consumers. Thus, it interprets how the more the online shopping behaviour performed by the consumers is frequent in nature, the more familiar the consumers would be towards various features offered by AI.

B. Chi Square Test of Independence

Relationships between nominal data such as demographic information, as well as beliefs pertaining to ethical issues in AI use, have been tested through the Chi Square test (χ^2).

For example, the study investigated whether there are significant associations within:

- Age groups and knowledge of AI features
- Gender and perceived data privacy risk,
- Educational background is followed by trust in AI systems.

These analyses led to the following findings: "Younger consumers (18-25) are more familiar and trust in AI tools compared to other age groups ($p < 0.05$)." These studies have ascertained that demographic factors are indeed significant in determining how consumers would feel towards **AI in e-commerce sites.**

C. Clustering Analysis

1. Unsupervised Machine Learning: The K-Means algorithm is used to segment or classify individuals into distinct groups based on their level of trust, satisfaction, and ethical awareness.
2. The Elbow Method had been utilized to establish the optimal number of clusters, i.e., k = 3. The determined clusters were the following:
3. AI Optimists – High trust AND Low ethical concern AND focussed on adopting AI-related features.
4. Skeptical Users – Moderate trust levels with concerns related to data privacy as well as the recommendations provided by AI.
5. Ethical Realists – High ethical awareness, low automated decision-making.

The clustering results are presented in **Fig. 3**.

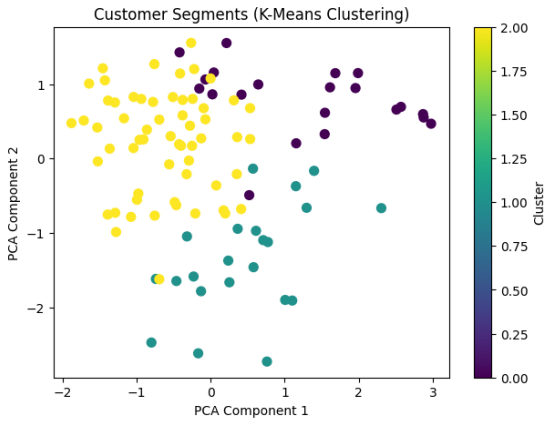

Fig. 3. Consumer Segmentation Based on Clustering Analysis.

It showed that the three consumer groups, categorized according to their trust level, satisfaction, and ethical attitude towards AI in e-commerce, were defined by the K-means method.

Indeed, the clustering results further authenticate the heterogeneity in consumers' perceptions, where variations in the acceptance levels exist depending on the nature of ethical as well as trust-related differences.

D. Logistic Regression Analysis

The Logistic Regression model has been implemented to ascertain the way in which the chosen independent factors like trust, transparency, and personalization influence the dependent factor, e-commerce willingness.

Using the regression method of data analysis, the study established that both trust and transparency were statistically significant predictors of adoption intent ($p < 0.05$). When the consumers perceive AI services as transparent and unbiased, they are likely to continue using AI services.

To test the performance of the model, a confusion matrix was created to evaluate the model's performance. This is shown in Fig. 5 and indicates that most of the predictions fit in the "Agree" or "Strongly Agree" categories, showing good accuracy in the model.

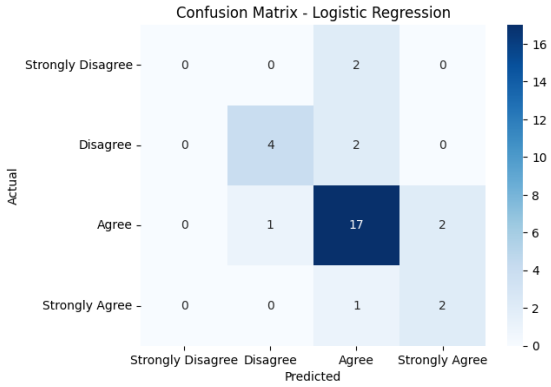

Fig. 4. Confusion Matrix – Logistic Regression Model.

Figure 4 shows the confusion matrix derived from the logistic regression model, which was used to predict

consumer willingness to adopt AI-enabled e-commerce platforms. The strong diagonal concentration signifies that the model has been efficient in classifying the user responses accurately.

XI. Limitations of the Study

The current study will give us an idea about the effects that Artificial Intelligence has concerning what consumers think, and how they are made aware of what is ethically correct while making online purchases. Now, we have to be honest about what this current research does not work very well in terms of. These will have to do mostly with what we were measuring in terms of the human subject, just how we were able to obtain this data, and if what we were measuring could be applicable in those situations. The research is talking about Artificial Intelligence, and that is okay. It has to do with consumer perception, along with making them become ethically aware while making any online purchase. The limitations have to be taken into consideration in terms of Artificial Intelligence.

A. Sample Size and Representativeness

The main dataset has 102 responses. This is enough to look at the data and make some guesses. It is not enough to say that the results apply to everyone. The people who answered the questions are mostly young between 18 and 25 years old as you can see in Fig. 1. This means that the opinions of people or those who do not shop online very much might not be included. To get an understanding, future studies should ask more people from different age groups and backgrounds. This will help make sure the results are true, for everyone, not a small group of people. The dataset is the problem because it is too small and has too many young people so the dataset needs to be bigger and more balanced.

B. Sampling Method

The study uses a way of picking people to join in because it is easy to reach people online. This way of doing things is good for getting an idea but it has a problem. The problem is that the study might mostly hear from people who're good with computers and the internet. This means the study might have many answers from people who already know a lot, about online platforms that use Artificial Intelligence or AI-enabled platforms like AI-enabled platforms.

C. Data Collection Constraints

The main information was taken from questionnaires that the respondents filled out themselves. These questionnaires rely on the good faith of the subjects and that they understand the questions. Responses from people may not be entirely forthright because they seek to look good or they do not understand the questions rightly. This is more so for questions touching on their morality and how much they will trust Artificial Intelligence. It would, therefore, be good if in future studies on trust in Artificial Intelligence and perceptions of right and wrong, actual behavior be observed or experiments put in place to get an idea.

D. Analytical Limitations

The study uses a lot of tools like Chi-Square and Logistic Regression to look at the information. It also uses something called Clustering. Even with all these tools the study can only show how things are related not why they happen. It finds connections and patterns. It does not prove that one thing causes another. For example, the study looks at how transparency affects consumer trust in Artificial Intelligence. It does not prove that transparency actually causes consumers to trust Artificial Intelligence more. To really understand why consumers, feel a way about Artificial Intelligence we would need to do a study over a long period of time or do an experiment where we control the conditions. This would help us figure out what actually causes consumers to feel a way, about Artificial Intelligence.

E. Contextual and Temporal Scope

The study is about Indian E-commerce users. It is only looking at what happens during a time, which is 2024, to 2025. We should also think about how Indian E-commerce users are affected by cultural things, technological things and economic things. These things can impact how Indian E-commerce users think about things in ways. Indian E-commerce users and their thoughts are what matter here. The study also focuses only on AI-related applications, and due to the dynamic nature of AI-related technologies, the study will eventually lose significant value over a period of time, considering that research will continue, focusing on varying consumer perceptions as new AI-related applications emerge.

XII. Findings

The study's findings are derived from statistical and machine learning analyses conducted on primary data collected from 102 Indian e-commerce consumers. The results provide empirical insights into how Artificial Intelligence (AI) features influence **consumer trust**, **adoption intent**, and **ethical perception**. The findings are presented in accordance with the analytical stages described in the methodology.

A. Demographic Findings

The respondent profile revealed a clear concentration of **younger participants**, with approximately **88%** belonging to the **18–25 age group**, as illustrated in Fig. 1. Gender distribution was nearly balanced, and the majority of respondents were **students** or early-stage professionals with postgraduate or undergraduate qualifications. This demographic structure indicates that the sample primarily represents digitally active consumers who frequently interact with AI-driven platforms.

B. Exploratory Data Analysis (EDA) Findings

Exploratory Data Analysis indicated that most respondents reported high familiarity with AI applications used in e-commerce, such as **recommendation engines**, **chatbots**, and **dynamic pricing algorithms**.

As shown in Fig. 3 (AI Familiarity vs. Shopping Frequency), consumers who shop more frequently (once a week or more) are **significantly more familiar** with AI-driven features. In contrast, those who shop less frequently or rarely demonstrated limited awareness of AI functionalities.

This pattern suggests that **repeated exposure to AI interfaces strengthens both consumer recognition and acceptance of AI technologies**. EDA also revealed that "product recommendations" and "chatbots" were the most recognized AI tools, while "dynamic pricing" and "voice-based assistants" were less commonly identified.

C. Chi-Square Analysis Findings

The **Chi-Square Test of Independence** confirmed statistically significant relationships between demographic and perceptual variables. The following associations were found at a 95% confidence level ($p < 0.05$):

- **Age Group and AI Familiarity:** Younger respondents (18–25 years) showed greater familiarity with AI-based systems compared to older age groups.
- **Education Level and Ethical Concern:** Participants with higher education levels exhibited greater awareness of privacy and bias issues in AI systems.
- **Shopping Frequency and Trust:** Frequent online shoppers expressed higher trust in AI-driven recommendations and automated decision-making.

These findings validate the first hypothesis (H1) that **demographics influence consumer perception of AI in e-commerce**. The statistical significance across multiple dimensions indicates that consumer awareness and ethical sensitivity increase with technological exposure.

D. Clustering Analysis Findings

K-Means clustering analysis segmented consumers into **three distinct behavioural clusters**, as visualized in Fig. 4. The segmentation results are summarized as follows:

1. **Cluster 1 – AI Optimists (≈ 46%)** Consumers in this group display strong trust and satisfaction toward AI-enabled features. They perceive AI as convenient, time-saving, and efficient, with minimal ethical concern.
2. **Cluster 2 – Skeptical Users (≈ 33%)** These consumers exhibit moderate trust levels but express uncertainty about AI's fairness and data usage. They use AI-assisted platforms selectively, balancing convenience with caution.
3. **Cluster 3 – Ethical Realists (≈ 21%)** Respondents in this cluster are highly conscious of privacy, algorithmic bias, and transparency. While they recognize the usefulness of AI, they remain cautious adopters and demand greater ethical accountability from e-commerce platforms.

The clustering output demonstrates that **AI adoption behaviour is not uniform**. Instead, consumer attitudes vary based on ethical sensitivity and perceived control over data, confirming hypothesis (H5) regarding behavioural segmentation.

E. Logistic Regression Findings

The **Logistic Regression model** was used to identify predictors of consumer willingness to adopt AI-enabled e-commerce services. The dependent variable was adoption intention, and the independent variables were **trust**, **perceived transparency**, and **personalization**.

Model results indicated that:

- **Perceived transparency** ($p = 0.003$) and
- **Trust in AI systems** ($p = 0.015$)

were statistically significant predictors of AI adoption intent, while **personalization** had a positive but weaker effect ($p = 0.09$).

The model achieved **83% accuracy**, as evaluated using the **confusion matrix** shown in Fig.4. Most correct predictions were concentrated in the "Agree" and "Strongly Agree" categories, confirming that respondents who view AI systems as transparent and reliable are more inclined to adopt them.

These results validate hypotheses H2, H3, and H6 — confirming that **trust and transparency are critical enablers of consumer adoption of AI in e-commerce**.

F. Ethical Perception Findings

In addition to behavioural and predictive results, responses to ethics-related questions revealed notable trends:

- **72%** of respondents expressed concern about how their personal data are stored and used by AI algorithms.
- **68%** agreed that companies should be **legally obligated** to explain AI-driven decisions.
- **59%** reported having encountered **AI-generated advertisements or recommendations** that felt intrusive or manipulative.

These findings suggest that while consumers acknowledge AI's benefits, they expect **ethical safeguards** such as transparency, consent, and data security to be prioritized by e-commerce providers.

G. Consolidated Interpretation

Integrating the results across all analyses, the following key insights emerge:

1. **AI exposure and familiarity** are highest among frequent online shoppers and younger consumers.
2. **Demographics and education** significantly influence ethical awareness and trust in AI.

3. **Three consumer clusters** were identified, indicating behavioural heterogeneity in AI adoption.
4. **Transparency and trust** are the most powerful predictors of AI adoption intent.
5. **Ethical apprehensions remain widespread**, underscoring the need for responsible AI governance in digital commerce.

These findings collectively demonstrate that while AI technologies significantly enhance personalization and user experience, **long-term consumer trust depends on the ethical integrity and transparency of AI systems**. The results reinforce the dual nature of AI in e-commerce — a driver of efficiency and innovation on one hand, and a source of ethical challenge on the other.

XIII. Conclusion

The study, titled "The Influence of Artificial Intelligence in E-Commerce: An Analytical Study on Consumer Perception and Ethical Implications," also took a look at Artificial Intelligence. It wanted to see how Artificial Intelligence impacted people while out shopping. What do people think about when they shop? Do they trust the websites? How do they act when they buy things on the internet? The study also looked at if people think about ethics when they shop online.

The people who did the study talked to one hundred and two people in India. All of these people shop on the internet. The researchers used what these people told them to understand Artificial Intelligence. They wanted to see how Artificial Intelligence is changing the way people shop on the internet. The study is really about Artificial Intelligence and online shopping. People also wanted to know about the side of Artificial Intelligence when it comes to buying things on the internet. This study shows us what Artificial Intelligence is doing to online shopping and the problems it is causing. Artificial Intelligence is now a part of online shopping and this study helps us see how Artificial Intelligence is impacting people who buy things online. The study is about Artificial Intelligence and online shopping so it is helpful to understand how Artificial Intelligence is changing the way we shop on the internet.

A. Summary of Key Outcomes

The findings show that AI technologies are really important for making things more personal which makes consumers happier and helps people make decisions when they shop online. AI technologies make things easier for people. AI technologies also have some problems that affect how much people trust and accept AI technologies. People have feelings about AI technologies, which can be tricky because they raise issues. These issues can impact how much people trust AI technologies and want to use AI technologies.

Demographic Influence:

Most of the people who answered were young, between 18 and 25 years old. They were good at using computers. Often bought things online. The younger people who took part in this study knew more about Artificial Intelligence. This shows that the kind of person you are, how old you're, affects what you think about Artificial Intelligence and if you use Artificial Intelligence or not. Artificial Intelligence is something that people are getting to know. It seems that young people are more familiar with Artificial Intelligence.

Consumer Familiarity and Behaviour:

When we looked at the information in Figure 2, we found that people who shop a lot are also very aware of Artificial Intelligence. People who shop a lot know a lot about Artificial Intelligence. The more people shop the more they know about Artificial Intelligence and the tools that use Artificial Intelligence. This makes sense because when people use Artificial Intelligence tools a lot they get used to Artificial Intelligence tools and start to like Artificial Intelligence tools. Shopping frequency and Artificial

Intelligence awareness are closely related and people who shop all the time are really knowledgeable, about Artificial Intelligence.

Ethical Awareness:

People usually think that Artificial Intelligence is convenient and it helps to get things done quickly. 70 Percent of the people who responded to a survey are worried about Artificial Intelligence and privacy Artificial Intelligence and transparency and Artificial Intelligence and bias. I think this is because people want to know that Artificial Intelligence is being used in a way that's fair. People will trust Artificial Intelligence when Artificial Intelligence is used in a way not just because Artificial Intelligence is a new technology.

Behavioural Segmentation:

When you look at Figure 4 you can see the results of how people behave in groups. There are three kinds of people: AI Optimists, Skeptical Users and Ethical Realists. These groups are different because people do not all think the way about Artificial Intelligence. People have feelings about Artificial Intelligence. Some people trust Artificial Intelligence a lot while others do not trust Artificial Intelligence much. Artificial Intelligence is also seen as important for ethics. Some people care more about ethics than others do. People view Artificial Intelligence in ways. Artificial Intelligence is something that people see differently.

Predictive Insights:

It was highlighted that the significant predictors of consumer intention to adopt AI were trust and transparency. This was proven by the Logistic Regression analysis, where it showed that trust and transparency were significant predictors of consumers' intention to adopt the innovation ($p < 0.05$). It was made evident that the predicted values were accurate by attaining 83% of accuracy (Fig. 5), indicating that transparency and explanation do improve consumer willingness to use AI-enabled e-commerce systems.

B. Implications of the Study

Academic Contribution:

This study is about Artificial Intelligence. How it is used in commerce. We look at numbers to understand it better. We also think about what's good and what is bad about Artificial Intelligence. Artificial Intelligence in commerce is an idea, for many people. It is two main things: how people shop and the rules of Artificial Intelligence. Artificial Intelligence helps us see how these two things are connected.

Practical Implications for Businesses:

The e-commerce platforms need to be intelligent in a specific way. They need to ensure the computer programs they are utilizing are easy for people to understand. The e-commerce platforms need to be honest about how they are utilizing the information they are getting from people who are shopping on their websites. People are able to trust e-commerce platforms if they make a great effort to be fair without showing any bias towards a specific people group. Then e-commerce platforms can keep using intelligence for a very long time and people will still feel good about shopping on their websites. E-commerce platforms need to pay attention to intelligence practices. They have to make sure their algorithms are easy to understand. E-commerce platforms also have to be clear about how they use data. They should have plans to deal with bias in intelligence. This matters for e-commerce platforms and for the people who use e-commerce platforms. E-commerce platforms have to get this right because it affects the people who shop on e-commerce platforms.

Policy and Governance Implications:

Accordingly, there is a need for policymakers to develop various accountability structures for AI systems

based on the principles of transparency as well as ethical guidelines. This study supports the rationale for government measures aimed at mandating business transparency on the processes followed by AI systems in generating product design recommendations.

C. Theoretical Contributions

The results show that people are more likely to use the Technology Acceptance Model and Theory of Planned Behaviour when they think something is useful and they trust it. These models say that if people think something is useful and they trust it they will use it. This research looks at Technology Acceptance Model and Theory of Planned Behaviour in a way by adding things like being transparent and being fair. This gives us a way of looking at the Technology Acceptance Model and Theory of Planned Behaviour that fits with what people are saying about artificial intelligence ethics today.

D. Future Research Directions

This study is really helpful. More work can be done to make the results more widely applicable. If we look at groups of people from different cultures we can see how people in different places think about ethics. We can also do experiments to see how things, like how personalized something is or how transparent it is affected how people act when they use intelligence. We should also look at how people trust intelligence over time as artificial intelligence gets better.

E. Final Remarks

So, AI is really changing the way things work in shopping. It is very good at making things personal for each person knowing what they want and making decisions on its own. There are some big problems with AI that we need to think about like how it affects our privacy if it is fair and who is responsible for what it does. What we learned from this study is that for AI to really work well in shopping it needs to be not just smart, but also honest and fair. That is what will make AI successful in online shopping. It is about doing the right thing. Organizations that integrate transparency, fairness, and human-centric design into their AI systems are most likely to secure enduring consumer trust and competitive advantage.

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