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Artificial Intelligence and Consumer Behavior: Evidence from the Online Retail Sector in Pakistan

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AI was positioned to become a disruptive power for the transformation of routine business practices carried out every day in the business and industrialized world. By allowing AI to play a role in business functions, companies can create marketing strategies that are faster, cheaper, and more accurate. The study investigates the purchasing behaviours of AI technology by consumers and how such performance demographics influence the purchasing behaviour. Data was gathered from 314 primary online shoppers in Karachi for this research. This research was analysed by SPSS software with descriptive data, correlation, the reliability tests-Cronbach's alpha coefficient, and ANOVA and Mann-Whitney U, and Kruskal-Wallis test. Studies showed that AI positively influences consumers' purchasing behaviour. Significant differences in consumer attitude were found between sex and the level of month income group comparisons results. Hypothesis validation. The study findings were validated.

1. Introduction

The surge of artificial intelligence (AI)–based solutions into the operations of many contemporary organizations is revolutionizing vital business workflows, and particularly those that necessitate real-time processing and analysis over complex data streams. In this paper, AI is characterized as the capability of computer systems to impersonate fundamental aspects of human cognition (such as learning, reasoning, and problem-solving) by means of techniques including but not limited to machine learning, deep learning, natural language processing, and computer vision (Russell & Norvig, 2016; Goodfellow et al., 2016; Islam et al., 2024). These are the systems that enable machines to pick up on subtle patterns from large amounts of data, enabling them to perform tasks akin to what humans do intuitively.

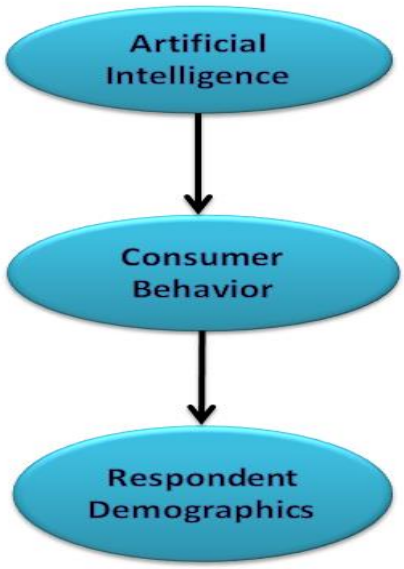
In marketing, AI is increasingly being applied as a tool for firms in their processes of digital transformation and enables firms to offer hyper-personalized experiences and predictions, make automated customer engagement decisions (Ngwe & Wiesenfeld, 2018; Cherian et al., 2025), which catches the ever-luring interest from both practitioners and scholars (Chaffey & Ellis-Chadwick, 2019; Kumar et al., 2021). Given the dynamic nature of retail and e-commerce, corporations will have to regularly consider new ways to operate and how they develop products. Alongside its pair with bid data analytics, AI helps retailers in dealing with this heterogeneous transaction data, customer journey, and external market conditions effectively to have better demand forecasting, service quality, and strategic decisions (Huang & Benyoucef, 2013; Chen et al., 2021). This calls for robust data-management activity and best-of-breed data mining techniques to be used by front-line managers in understanding the outputs of analytics, adopting them to enhance business performance – leading to competitive superiority.

On a macro scale, AI is projected to be one of the most crucial contributors to global growth. Such applications of AI are projected to raise total global GDP by around 14% (approximately US$15.7 trillion) in 2030, primarily through productivity gains and via new consumption demand patterns (Brynjolfsson & McAfee, 2014; Chui et al., 2017; Durmuş Şenyapar, 2024). It's that the size of the value pie at stake is precisely why companies in almost every sector must rethink their competitive strategy, customer-engagement model , and marketing game plan in response to AI disruption.

Despite this fast diffusion, the literature on AI's influence over consumer choices—in particular for online shopping—not only remains relatively scattered, but also has not been systematically reviewed. Existing literature and recent empirical evidence indicate that AI-based personalization, chatbots, and predictive analytics can exert a more prominent impact on customer engagement, loyalty, and purchase intentions at different stages of the online retail process (López et al., 2020; Salo et al., 2021). Some even claim that AI makes it possible for brands to control the journey from early information seeking and alternative consideration, right through to purchase and post-purchase. But the majority of existing studies focus on a single tool or platform and seldom see AI as a holistic decision environment from the consumer perspective. In addressing this void, the purpose of this study is to examine how AI agents operating within online retail contexts influence consumers' purchase decisions and ultimately their buying behaviour – more specifically, with respect to

(i) how AI affects purchasing outcomes; and (ii) the mechanism by which AI-supported interactions impact consumer behaviour.

Figure No 1:Conceptual Framework



2. Literature Review

Artificial Intelligence (AI) is increasingly being recognized as a disruptive force in a wide range of areas, spanning from healthcare, education, commerce, and even the automotive industry. In the past few years, AI technology has penetrated marketing activities widely and achieved considerable success (Durmuş Şenyapar, 2024; Kaur, 2024). The rapid development of AI technology has greatly promoted the efficiency of data analysis and marketing in practical applications and academic research (Cherian et al., 2025; Islam et al., 2024).

Ultimately, for marketing AI to be successful, it should predict answers customers want to make decisions and improve their overall brand experience. Complex smart systems using ML, predictive analytics, and other advanced algorithms digest huge customer and context data sets to calculate probabilities of purchase to target messages/offerings (Zulaikha et al., 2020; Durmuş Şenyapar, 2024). These systems are driven by sophisticated data-intelligence capacities that can first identify patterns as they unfold in real time, and then tweak recommendations, prices, and content to consumers as they pass from one browsing or clicking experience to another (Bastray 2025; Shenyapar 2024). Towards this end, AI aims to empower machines with the ability to think in a human-like mode (able to learning from feedback, reason in the presence of uncertainty, and problem-solving) when they perform self-driven automated decisions at a digital scale (Gupta, 2025; Islam et al., 2024). For such applications to be successful, they must be supported by these mature back-ends for data architecture and analytics pipelines that can easily integrate disparate types of data sources

and help models more quickly and accurately learn about their customer behaviors (Sivasankari et al., 2025; Kaur, 2024).

2.1 Artificial Intelligence in Online Retail Marketing

Marketing has been described as a set of activities and processes that organisations use to create, communicate, deliver, and exchange value with the customers, clients, partners, and society at large (Odeyemi et al., 2024; Girsawale et al., 2024). Within this related AI has been a strategic capability of organisations to reduce manual labour and improve the efficiency in using vast volumes of customer and market detail for advanced analytics, automation (Turatti, 2025; Jain, 2025; Bhattacharya et al., 2025). Analyze and papers suggest that combining AI with marketing campaigns ensures better performance, customer satisfaction, as well as growth in revenue through accurate targeting, personalization, and, more importantly, optimizing media spend. For instance, McKinsey and Company (2025), Sitecore (2024), and Reuters (2025).

The belief that AI virtual assistants will become new and significant sales channels demonstrates how chatbots using natural language processing are increasingly being adopted by e-commerce players, as the software takes on inquiries from customers, product search navigation, and after-sales support. These instruments result in more customer retention rates, particularly of service channels, and an increase in sales and conversion (Rasheed, 2025; Abhulimen & Ejike, 2024). To satisfy growing customer expectations and cost constraints, brick-and-mortar businesses with online business arms as well as "pure players" on the Web are introducing sophisticated AI into logistics, pricing, and customer service to rely upon automation and data-based decision-making as cheaper alternatives or complements to traditional e-commerce models (Gaikwad et al., 2024; Mossavar Rahmani, 2023).

2.2 Artificial Intelligence and Consumer Behavior

The conversion process has typically been measured as five stages: need titration or problem identification, information search, alternative evaluation, purchase selection, and post-purchase reprisal (Gupta, 2025; Oğuz, 2024; Thakur & Kumar, 2024). At each of these stages, AI now ‘has its foot on the pedal’, sifting through massive rivers of behavioural, transactional, and contextual data to uncover deep-rooted subconscious preferences and predict what people will do next (Khamoushi 2024; Leelavemula 2025). With such capabilities, organizations can harness vast data availability of rapidly "growing" and "changing" consumers into actionable knowledge for segmentation, targeting, and sales forecasting that is used operationally to make more informed marketing decisions (Yazdani & Darbani, 2023; Islam et al., 2024; Turatti, 2025).

At the front, these understandings are taken to recommenders or dynamic catalog layout and personalized offers that best match the user’s profile and history (Kumar, 2025; Bansal & Gupta, 2023). As a strategy, understanding the consumer journey, from creation to advocacy/loyalty stage, with AI being utilized by marketers in planning tailored touchpoints across many channels during different shocks (Bouhlal & Belahcen, 2025; Pasupuleti, 2025).

H_1: A statistically significant relationship exists between artificial intelligence and consumer buying behavior.

H_2: There is no notable difference in consumer buying behavior based on demographic characteristics such as gender and annual income.

3. Methodology

This study employed a descriptive research design, with the aim of describing and interpreting features of the main variables of interest. This information was collected from Karachi, Pakistan, in January 2025. A convenience non-probability method has been used to take respondents available at the research site. The group of interest is the internet buyer. A total of 384 online shoppers were invited to participate through the link of a survey, while 368 usable and full responses comprised the final data set for analysis.

An online structured self-administered questionnaire was applied for data collection. The structure of the instrument was segregated into two parts: Part one was devoted to identifying demographic information of the respondents, while Part two covered the main investigational constructs related to artificial intelligence and consumer behaviour. It comprised two sub-sections: the main data section, which contained 10 items on AI characteristics and 8 to assess the behavior of consumers, all rated by means of a five-point Likert scale. The basic information source used for background was the Internet (scientific papers, magazine articles, etc).

Data were analysed with SPSS software version 24. Descriptive statistics and correlation analysis, and the reliability test by Cronbach‘s alpha were performed on the data. Additionally, statistical inferential methods such as ANOVA or the Mann–Whitney U/Kruskal–Wallis tests were utilized to examine group differences and relationships between study measures.

4. Analysis

4.1 Analysis of AI and Consumer Buying Behavior

Table No 2: Reliability Statistics

Sr. No.	Construct	Cronbach's Alpha
1	Artificial Intelligence (10 items)	0.999
2	Consumer Buying Behavior (8 items)	0.976

The Reliability of the Artificial Intelligence and Consumer Buying Behavior scales was confirmed through Cronbach’s alpha values of 0.999 and 0.976, which exceed the 0.7 threshold.

Table No 3: Correlation Matrix

Variables	Correlation Coefficient	Significance Level
AI & Consumer Behavior	0.854**	0.000

The correlation matrix has identified an important positive connection between Artificial Intelligence and Consumer Behavior that reaches significance at the 0.01 level.

4.1 Regression Analysis

Hypothesis H1 tested the effect of AI on consumer behavior using regression analysis.

Table No 4: ANOVA Summary

Source	Sum of Squares	Df	Mean Square	F (Sig.)
Regression	285.593	1	291.64	8819.09 (.000)
Residual	12.715	381	0.034	
Total	298.308	382		

Table No 5: Simple Regression Results

Model	B	Std. Error	t	Sig.
Constant	0.123	0.049	3.533	0.011
AI	0.554	0.017	73.513	0.000

Table No 6: Mann-Whitney U Test – Gender Differences in Buying Behavior

Gender	Mean Rank	U	W	Z	Sig.
Male	135.1	5898	27459	-13.586	0.000
Female	272.9				

The Mann-Whitney U test confirmed a statistically significant difference in consumer buying behavior between males and females ($p < 0.05$), leading to the rejection of the null hypothesis H2 for gender.

Table No 7: Kruskal-Wallis Test – Buying Behavior by Income Group

Income Group	Mean Rank	Chi-Square	df	Sig.
Less than 50000	161.9	113.98	2	0.000
50001–85000	169.7			
85001–10000	285.87			
10000 and above	176.97			

The Kruskal-Wallis test indicated a significant difference in buying behavior across different income groups ($p < 0.05$). Therefore, the null hypothesis H2 is also rejected in terms of income levels.

4.2 Discussion

Findings of this research are solid empirical indications that artificial intelligence considerably influences the consumer purchasing decision in the online retail market of Pakistan. The regression model reveals that the impact of AI on the consumer purchase decision is highly and positively elated (= .554, p =.001). The results are consistent with recent studies conducted globally that have shown AI to increase the accuracy of the recommendation, the level of customer satisfaction, and the probability of making a purchase due to the ability to customize the shopping experience based on specific preferences (Huang and Rust, 2021; Shankar, 2022). At present, in the Pakistani context, where the process of digitalization has moved at a very fast pace in the recent years, AI-driven personalization seems to be a crucial factor stimulating the online shopping behavior.

The high impact of AI identified in the research confirms the thesis that consumers are progressively using intelligent systems to help them in the evaluation of products, simplification of decisions, and reduction of risk (Grewal et al., 2021). When online customers use the AI-based tools: chatbots, recommendation engines, predictive analytics, etc., they are likely to find online shopping more convenient and reliable. This is in line with the findings that AI causes a decrease in cognitive effort as well as an increase in perceived usefulness, which enhances purchase intentions (Pantano et al., 2023).

The second large discovery is related to demographic variations with regard to consumer behavior. In contrast to the first hypothesis (H 2), gender and level of income yield significant differences. These findings can be compared to previous literature that proves that demographic factors influence technology acceptance behavior, perceptions of usefulness, and trust in AI-based systems (Qazi et al., 2020; Ajibade, 2022). As an illustration, income groups might have disparities in digital literacy, access to technology, and the frequency of online purchasing, whereas gender-based disparities might exist due to the difference in their levels of comfort with AI-based automation.

Therefore, the research supports the notion that AI does not affect the consumers evenly in the context of different sociocultural groups, and demographic segmentation is a significant factor that a marketer should take into account. The results also add to the body of research that claims that demographic diversity moderates consumer reactions to digital technologies in new economies (Hasan et al., 2023).

Altogether, the findings prove that AI is a disruptive technology in online shopping, which alters the manner in which consumers cognitively process information as well as finalizing their shopping decisions. The results are relevant to the modern literature as they provide empirical evidence on Pakistan, a fast-evolving digital market, but a comparatively unexplored situation regarding AI-consumer behavior studies.

5. Conclusion

The actors studied the effects of AI in the background of consumers making decisions, from which aspects gender characteristics and income bias affected consumer decisions. The study found that the effect of AI on purchase decisions is very strong and positive. A chi-square test showed that gender and income are significantly related to consumers' online shopping behaviors based on earlier analysis. The results suggest the significant role of marketers in utilizing AI technology on specific consumers so as to improve the audience's satisfaction levels with marketing.

5.1 Theoretical Implications

This paper is valuable to the theory of consumer behavior and digital marketing in a number of ways. First, it supports technology acceptance theory that supposed that intelligent systems augment behavioral intention because of improved perceived ease of use and usefulness (Venkatesh et al., 2022). The high influence of AI on the choices to buy indicates the importance of automation and individualization as the essential theoretical processes that drive consumer choices (Huang and Rust, 2021).

Second, the discovery of demographic disparities also adds value to theoretical thinking as it demonstrates that consumer reactions to AI are not equal across different population groups. This is in line with the new literature that demands the addition of demographic-sensitive extensions of AI adoption theories (Ajibade, 2022). This study is therefore an important theoretical basis to study the interaction of individual differences with intelligent technologies in online retail environment.

5.2 Managerial Implications

The results have significant implications to web merchants and web marketers in Pakistan. Considering that AI can boost the purchase behavior substantially, companies must also consider additional integration of AI-based recommendation systems, personalized advertisements, and automated chatbots to strengthen the level of interaction and customer satisfaction (Grewal et al., 2021). Customer-level personalization should also be paid close attention to by retailers since AI has a high predictive capacity in decision-making.

The discrepancies in terms of demographics imply that the marketing practices are to be divided. An example is that income groups might have more AI needs, e.g. recommendations that are more cost-conscious, or prompts that can be used to buy an item in installments. Equally, the shopping habits of each gender can also be exploited to come up with AI-powered product recommendations that are more tailored. Marketers can also invest in consumer education to lower the levels of anxiety about AI systems, particularly among lower-digitally literate users.

5.3 Policy Implications

Considering the fast implementation of AI in the digital economy of Pakistan, policymakers must assist in promoting the increase of digital literacy levels among representatives of different demographic groups to help eliminate the gap in the technological use (Hasan et al., 2023). The regulatory and the government must make the use of AI transparent and ethical to make sure that consumers are aware of how their data is utilized in order to personalize marketing (Shankar, 2022). Competitiveness and consumer confidence can be enhanced through the adherence to the policy that enhances innovation in the AI systems i.e. incentives to encourage local e-commerce organizations to use sophisticated predictive analytics. Moreover, the policies applicable to consumer protection should

guarantee that AI-driven suggestions are non-invasive, unbiased, and reliable in adhering to the new data privacy regulations.

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