Unveiling the Role of Artificial Intelligence and its Impact on Consumer Buying Behaviour in Online Fashion Retail: A Comprehensive Study

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Abstract

This comprehensive study delves into the intricate dynamics between Artificial Intelligence (AI) and consumer buying behaviour within the realm of online fashion retail. As the digital landscape continues to evolve, AI technologies have become increasingly integral to shaping consumer preferences and purchasing decisions. This research endeavours to elucidate the multifaceted role played by AI in influencing consumer behaviour, spanning aspects such as perceived value, ease of use and impact on purchase decisions. Through a meticulous analysis of online fashion retail platforms, this study seeks to provide valuable insights into the intricate interplay between AI innovations and consumer behaviour, thus contributing to a deeper understanding of the contemporary retail landscape.

Keywords: Artificial Intelligence, Consumer Buying Behaviour, Online Fashion Retail, Perceived Value, Purchase Decisions

Introduction

In the rapidly evolving landscape of online retail, the integration of Artificial Intelligence (AI) technologies has emerged as a transformative force, reshaping consumer behaviour and preferences. Particularly within the realm of fashion retail, where trends change at a moment's notice and personalisation is paramount, understanding the role of AI in influencing consumer buying behaviour is crucial for both retailers and researchers alike.

This comprehensive study seeks to delve into the intricate dynamics between AI and consumer behaviour within the context of online fashion retail. As AI technologies continue to advance, their impact on various aspects of the consumer journey, from product discovery to purchase decisions, becomes increasingly profound. By unravelling these complexities, this research aims to shed light on how AI shapes consumer perceptions, preferences and ultimately, purchasing behaviours in the online fashion retail environment.

The significance of this study lies in its comprehensive approach, which encompasses a broad spectrum of AI-driven interventions in online fashion retail. From personalised product recommendations to virtual fitting rooms and AI-powered chatbots, the myriad applications of AI have revolutionised the way consumers interact with fashion brands and retailers. Understanding the implications of these AI-driven innovations is essential for retailers seeking to stay competitive in an increasingly digital marketplace.

Moreover, this study contributes to the broader scholarly discourse on AI and consumer behaviour by offering insights into the specific nuances of the fashion retail sector. While previous research has explored the impact of AI in various retail contexts, there remains a gap in our understanding of how these technologies influence consumer perceptions and behaviours within the unique context of fashion. By focusing specifically on online fashion retail, this study aims to address this gap and provide valuable insights for both academia and industry.

Review of Literature

In the "Role of Artificial Intelligence in Retail", Liang *et al*., 2020, the research studies have highlighted the increasing integration of Artificial Intelligence (AI) technologies in the retail sector. AI applications such as recommendation systems, personalised marketing and virtual assistants have revolutionised the way retailers interact with consumers and influence their purchasing decisions.

Influence of AI on Consumer Behaviour: Sweeney *et al*., 2021 show that AI-driven technologies significantly impact consumer behaviour in online shopping environments. AI-powered product recommendations,

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personalised shopping experiences and chatbots have been found to enhance consumer engagement and satisfaction, ultimately affecting purchase decisions.

Perceived Value and Ease of Use in Online Retail: Chen, Wang & Xie (2020), Studies investigating the role of perceived value and ease of use in online retail have underscored their importance in shaping consumer preferences and behaviour. AI-driven features such as personalised product recommendations and intuitive user interfaces contribute to enhancing perceived value and ease of use, thereby influencing consumer buying behaviour.

Impact of AI on Purchase Decisions, Hu *et al*., 2021, the impact of AI on purchase decisions has been a focal point of research in the retail industry. AI-driven algorithms that analyse consumer data and predict preferences play a crucial role in guiding purchase decisions by providing personalised product suggestions and tailored shopping experiences.

Comprehensive Studies in Online Fashion Retail: Wang *et al*., 2021, Comprehensive studies exploring the interplay between AI technology and consumer behaviour in the online fashion retail sector are relatively limited. However, existing research underscores the significance of understanding how AI influences consumer perceptions, preferences and purchasing decisions in the context of fashion retailing.

Research Objectives

To analyse the impact of AI on consumer buying behaviour in the online fashion retail industry.

Hypothesis

H_1 - The impact of AI in online fashion retail platforms has a significant influence on consumer buying behaviour.

H_0 – The impact of AI in online fashion retail platforms has no significant influence on consumer buying behaviour.

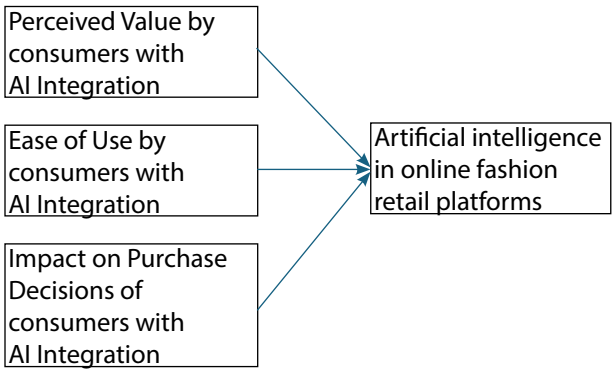
Sources of Data Collection

The research methodology incorporates both primary and secondary sources of data collection. It adopts an applied and descriptive research approach. A sample size of 100 respondents has been selected for the study.

Variables in the Research

"Consumer buying behaviour" is the dependent variable, as it is the outcome that is being influenced or impacted by another factor, which is AI in online fashion retail platforms. So, "AI in online fashion retail platforms" is the independent variable.

Research Framework



Cronbach's Alpha

Data Analysis and Interpretation

Reliability Statistics	
Cronbach's Alpha	No. of Items
0.96	14

A Cronbach's alpha coefficient of more than 0.96 suggests an exceptionally high level of internal consistency reliability within the items of a scale or test. It implies a strong degree of reliability in the measurement instrument, which enhances its credibility and utility for research or assessment purposes.

Tabulation of Likert Scale

Table 1. Ai-Driven Recommendations Enhance My Shopping Experience on Online Fashion Platforms

Value	Observed N	Expected N
Strongly Disagree	2	20
Disagree	3	20
Neutral	30	20
Agree	35	20
Strongly Agree	30	20
Total	100	

Interpretation: The majority of respondents (65%) agree or strongly agree that AI-driven recommendations enhance their shopping experience, with 30% of respondents remaining neutral. This suggests a generally positive perception of AI in improving the shopping experience, though a significant neutral

response indicates that some users may not be strongly affected or are undecided about the impact of AI recommendations.

Table 2. I Perceive Ai Technology as aValuable Tool For Improving My Online Fashion Shopping Experience

Value	Observed N	Expected N
Strongly Disagree	3	20
Disagree	4	20
Neutral	27	20
Agree	32	20
Strongly Agree	34	20
Total	100	

Interpretation: Most respondents (66%) agree or strongly agree that AI technology is valuable for enhancing their online shopping experience. Only a small percentage (7%) disagree or strongly disagree, indicating a positive reception towards AI as a beneficial tool in the online fashion industry.

Table 3. I Perceive Ai Technology as aValuable Resource for Discovering New Fashion Brands and Designers

Value	Observed N	Expected N
Strongly Disagree	7	25
Neutral	27	25
Agree	33	25
Strongly Agree	33	25
Total	100	

Interpretation: A strong majority (66%) agree or strongly agree with the statement, indicating that AI is seen as an effective tool for discovering new brands and designers. The neutral response is also significant (27%), suggesting that some users might not have a strong opinion or experience regarding this aspect of AI in fashion.

Table 4. The Integration of Ai Enhances the Overall Value Proposition of Online Fashion Retail Platforms

Value	Observed N	Expected N
Strongly Disagree	5	20
Disagree	5	20
Neutral	20	20
Agree	36	20
Strongly Agree	34	20
Total	100	

Interpretation: A substantial 70% of respondents agree or strongly agree that AI integration adds value to online fashion retail platforms. Only 10% disagree or strongly disagree, reflecting a predominantly positive view of AI's contribution to the perceived value of these platforms.

Table 5. I Believe that Ai Integration Contributes to a More Efficient and Satisfying Shopping Process on Online Fashion Platforms

Value	Observed N	Expected N
Strongly Disagree	5	20
Disagree	3	20
Neutral	29	20
Agree	42	20
Strongly Agree	21	20
Total	100	

Interpretation: A significant majority (63%) of respondents agree or strongly agree that AI integration improves the efficiency and satisfaction of the shopping process. However, a noteworthy portion (29%) remain neutral, indicating that while AI is seen as beneficial, it may not be universally impactful or could be dependent on the specific user experience.

Table 6. I Feel Comfortable Relying on Ai Technology to Assist Me in My Online Fashion Shopping Journey

Value	Observed N	Expected N
Disagree	19	25
Neutral	32	25
Agree	29	25
Strongly Agree	20	25
Total	100	

Interpretation: The responses are more varied here, with only 49% agreeing or strongly agreeing, and 32% remaining neutral. A notable 19% disagree with the statement, indicating that while many users are comfortable with AI, there is still some hesitation or discomfort among a significant portion of the population.

Table 7. The Responsiveness of Ai-Generated Recommendations Enhances My Overall Browsing Experience

Value	Observed N	Expected N
Strongly Disagree	2	20
Disagree	5	20
Neutral	28	20
Agree	43	20
Strongly Agree	22	20
Total	100	

Interpretation: A large majority (65%) of respondents agree or strongly agree that the responsiveness of AI-generated recommendations enhances their browsing experience, with 28% being neutral. This suggests that timely and relevant recommendations are crucial for a positive user experience.

Table 8. The Convenience of Ai-Driven Features Encourages Me to Explore and Engage With Online Fashion Platforms More Frequently

Value	Observed N	Expected N
Strongly Disagree	2	20
Disagree	5	20
Neutral	26	20
Agree	50	20
Strongly Agree	17	20
Total	100	

Interpretation: The majority of respondents (67%) agree or strongly agree that AI-driven features encourage more frequent engagement with online fashion platforms. The significant positive response indicates that convenience provided by AI is a strong motivator for user engagement.

Table 9. Ai Integration Simplifies the Process of Finding and Selecting Fashion Items that Match My Preferences

Value	Observed N	Expected N
Strongly Disagree	5	25
Neutral	37	25
Agree	42	25
Strongly Agree	16	25
Total	100	

Interpretation: A strong majority (58%) agree or strongly agree that AI simplifies finding and selecting fashion items, though a significant portion (37%) remains neutral. The high neutral response could indicate that while AI is helpful, it may not always match user preferences or some users are indifferent to the impact of AI on their selection process.

Table 10. I Feel More Confident in My Purchasing Decisions When Supported By Ai-Generated Recommendations

Value	Observed N	Expected N
Strongly Disagree	2	20
Disagree	9	20
Neutral	39	20
Agree	34	20
Strongly Agree	16	20
Total	100	

Interpretation: 50% of respondents agree or strongly agree that AI-generated recommendations boost their confidence in purchasing decisions. However, a large percentage (39%) are neutral, suggesting that while AI can instil confidence, it is not always a decisive factor for many users.

Table 11. The Presence of Ai Technology Significantly Impacts the Products I Choose to Buy on Online Fashion Platforms

Value	Observed N	Expected N
Strongly Disagree	2	20
Disagree	7	20
Neutral	40	20
Agree	36	20
Strongly Agree	15	20
Total	100	

Interpretation: A majority (51%) agree or strongly agree that AI impacts their product choices, while 40% are neutral. This indicates that AI plays a role in influencing purchasing decisions, though for many, it may not be a strong determinant.

Table 12. I Am More Likely to Prioritize Products Recommended by Ai Algorithms Over Others on Online Fashion Platforms

Value	Observed N	Expected N
Strongly Disagree	2	20
Disagree	8	20
Neutral	38	20
Agree	33	20
Strongly Agree	19	20
Total	100	

Interpretation: 52% of respondents agree or strongly agree that they prioritize AI-recommended products, while 38% are neutral. This suggests that AI recommendations do influence user choices, though a significant portion of users may not give them much weight.

Table 13. The Presence of Ai Technology Affects My Purchasing Decisions Across Different Categories of Fashion Items

Value	Observed N	Expected N
Strongly Disagree	2	20
Disagree	9	20
Neutral	37	20
Agree	34	20
Strongly Agree	18	20
Total	100	

Interpretation: The responses are varied, with 52% agreeing or strongly agreeing that AI influences their purchasing decisions across different categories. The 37% neutral response indicates that while AI is impactful, it may not be universally influential across all fashion categories.

Table 14. Ai Integration Influences My Perception of Online Fashion Platforms as Trustworthy and Reliable Sources for Shopping

Value	Observed N	Expected N
Strongly Disagree	2	20
Disagree	4	20
Neutral	41	20
Agree	35	20
Strongly Agree	18	20
Total	100	

Interpretation: A majority (53%) agree or strongly agree that AI integration positively influences their perception of the trustworthiness and reliability of online fashion platforms. The high neutral response (41%) suggests that while AI can enhance trust, it may not be a decisive factor for all users.

A chi-square analysis with a p-value less than 0.05 indicates that there is sufficient evidence to reject the null hypothesis. In other words, the observed frequencies in the data are significantly different from the expected frequencies based on the null hypothesis. This suggests that there is a statistically significant association between the variables being examined. Therefore, we reject the null hypothesis and conclude that there is evidence of a relationship or association between the variables at the chosen level of significance. The alternate hypothesis is accepted by rejecting the null hypothesis that is impact of AI in online fashion retail platforms has a significant influence on consumer buying behaviour.

It is noted that, apart from the 6th question, all questions from 1 to 14 demonstrate a p-value of less than 0.05. This outcome suggests the acceptance of the alternative hypothesis and the rejection of the null hypothesis.

The factor analysis results indicate that factor loadings exceeding 0.5 denote a significant relationship between the components and the corresponding variables.

Table 15. The Chi-Square Test

	Chi-square	df	Asymp. Sig.
AI-driven recommendations enhance my shopping experience on online fashion platforms.	51.9	4	0
I perceive AI technology as a valuable tool for improving my online fashion shopping experience.	46.7	4	0
I perceive AI technology as a valuable resource for discovering new fashion brands and designers.	18.24	3	0
The integration of AI enhances the overall value proposition of online fashion retail platforms.	45.1	4	0
I believe that AI integration contributes to a more efficient and satisfying shopping process on online fashion platforms.	54	4	0
I feel comfortable relying on AI technology to assist me in my online fashion shopping journey.	5.04	3	0.169
The responsiveness of AI-generated recommendations enhances my overall browsing experience	57.3	4	0
The convenience of AI-driven features encourages me to explore and engage with online fashion platforms more frequently.	74.7	4	0
AI integration simplifies the process of finding and selecting fashion items that match my preferences.	36.56	3	0
I feel more confident in my purchasing decisions when supported by AI-generated recommendations.	50.9	4	0
The presence of AI technology significantly impacts the products I choose to buy on online fashion platforms.	58.7	4	0
I am more likely to prioritize products recommended by AI algorithms over others on online fashion platforms.	48.1	4	0
The presence of AI technology affects my purchasing decisions across different categories of fashion items.	46.7	4	0
AI integration influences my perception of online fashion platforms as trustworthy and reliable sources for shopping.	62.5	4	0

Based on the analysis, it is observed that Q1, Q6, Q7, Q8, Q10, Q11, Q12, Q13, and Q14 exhibit a significant relationship with the first component, while Q1, Q6, Q7, Q8, Q10, Q11, Q12, Q13, and Q14 demonstrate a significant relationship with the second component.

The variables of consumers' perceptions of value, ease of use, and impact on purchase decisions in the context of AI integration exhibit a significant relationship with AI within online fashion retail platforms.

Findings

A Cronbach's alpha coefficient of more than 0.96 suggests an exceptionally high level of internal consistency reliability within the items of a scale or test. It implies a strong degree of reliability in the measurement instrument, which enhances its credibility and utility for research or assessment purposes.

A chi-square analysis with a p-value less than 0.05 indicates that there is sufficient evidence to reject the null hypothesis. In other words, the observed frequencies in the data are significantly different from the expected frequencies based on the null hypothesis. This suggests that there is a statistically significant association between the variables being examined. Therefore, we reject the null hypothesis and conclude that there is evidence of a relationship or association between the variables at the chosen level of significance. The alternate hypothesis is accepted by rejecting the null hypothesis that is impact of AI in online fashion retail platforms has a significant influence on consumer buying behaviour.

It is noted that, aside from the 6th question, all questions from 1 to 14 demonstrate a p-value of less than 0.05. This outcome suggests the acceptance of the alternative hypothesis and the rejection of the null hypothesis.

Table 16. Factor Analysis

	Component	
	1	2
AI-driven recommendations enhance my shopping experience on online fashion platforms.	0.64	0.53
I perceive AI technology as a valuable tool for improving my online fashion shopping experience.	0.84	0.37
I perceive AI technology as a valuable resource for discovering new fashion brands and designers.	0.8	0.38
The integration of AI enhances the overall value proposition of online fashion retail platforms.	0.79	0.29
I believe that AI integration contributes to a more efficient and satisfying shopping process on online fashion platforms.	0.83	0.19
I feel comfortable relying on AI technology to assist me in my online fashion shopping journey.	0.51	0.64
The responsiveness of AI-generated recommendations enhances my overall browsing experience	0.7	0.57
The convenience of AI-driven features encourages me to explore and engage with online fashion platforms more frequently.	0.74	0.51
AI integration simplifies the process of finding and selecting fashion items that match my preferences.	0.78	0.27
I feel more confident in my purchasing decisions when supported by AI-generated recommendations.	0.28	0.77
The presence of AI technology significantly impacts the products I choose to buy on online fashion platforms.	0.4	0.78
I am more likely to prioritize products recommended by AI algorithms over others on online fashion platforms.	0.29	0.83
The presence of AI technology affects my purchasing decisions across different categories of fashion items.	0.27	0.87
AI integration influences my perception of online fashion platforms as trustworthy and reliable sources for shopping.	0.34	0.85

The factor analysis results indicate that factor loadings exceeding 0.5 denote a significant relationship between the components and the corresponding variables. Based on the analysis, it is observed that Q1, Q6, Q7, Q8, Q10, Q11, Q12, Q13, and Q14 exhibit a significant relationship with the first component, while Q1, Q6, Q7, Q8, Q10, Q11, Q12, Q13, and Q14 demonstrate a significant relationship with the second component.

The variables pertaining to consumers' perceptions of value, ease of use, and impact on purchase decisions in the context of AI integration exhibit a significant relationship with artificial intelligence within online fashion retail platforms.

Conclusion

In conclusion, the findings from the various analyses conducted in this study provide compelling evidence of the significant impact of AI on consumer buying behaviour within online fashion retail platforms.

Firstly, the exceptionally high Cronbach's alpha coefficient exceeding 0.96 indicates a remarkable level of internal consistency reliability within the measurement instrument used in the study. This robust reliability enhances the credibility and utility of the research findings, ensuring that the conclusions drawn are based on consistent and reliable data.

Secondly, the results of the chi-square analysis reveal that the p-values associated with the variables examined are all less than 0.05, indicating a statistically significant association between AI integration in online fashion retail platforms and consumer buying behaviour. By rejecting the null hypothesis, we accept the alternate hypothesis, affirming that the impact of AI on online fashion retail significantly influences consumer purchasing decisions.

Additionally, the factor analysis highlights significant relationships between the components and corresponding variables, further corroborating the influence of AI on consumer behaviour in online fashion retail. Notably, the identified relationships between variables such as perceived value, ease of use, and impact on purchase decisions underscore the multifaceted role of AI integration in shaping consumer preferences and behaviours.

Overall, the comprehensive analysis conducted in this study provides robust evidence supporting the significant impact of AI on consumer buying behaviour within online fashion retail. These findings contribute valuable insights to both academia and industry, informing strategies for leveraging AI technologies to enhance consumer engagement, satisfaction and ultimately, business performance in the digital retail landscape.

Scope for Further Research

Cross-cultural variations in consumer responses to AI-driven interventions in online fashion retail platforms can provide insights into the cultural nuances of technology adoption and consumer behaviour. Comparative studies across different cultural contexts could uncover culturally specific preferences, attitudes, and concerns regarding AI technologies, guiding retailers in designing culturally tailored AI solutions.

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