From Awareness to Adoption: Exploring Augmented Reality-Based Shopping among Soft-Goods Consumers in the Nilgiris

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ABSTRACT

Augmented Reality (AR) is increasingly transforming the online shopping environment by enabling consumers to visualize and interact with products before making purchase decisions. The present study aims to assess the level of awareness and usage of AR-based shopping features and to examine the factors associated with consumers' adoption intention. The study focuses on soft-goods consumers in the Nilgiris District, with particular attention to virtual try-on, product visualization, colour and style visualization, and other interactive AR-enabled shopping features. A descriptive research design is adopted, with a proposed sample of 100 respondents selected through non-probability convenience sampling.

Primary data are collected using a structured questionnaire covering awareness, usage, perceived usefulness, ease of use, interactivity and shopping experience, trust and confidence, and adoption intention. The data are analysed using frequency and percentage analysis, mean and standard deviation, Cronbach's Alpha, Pearson correlation, independent samples t-test, one-way ANOVA and multiple regression analysis**.** The study seeks to provide empirical insights into the relationship between consumer awareness, actual usage and adoption intention towards AR-based shopping features and to contribute to understanding technology-enabled consumer behaviour in the soft-goods retail sector in the Nilgiris.

Key words: Augmented Reality, online shopping, visualize, consumers, AR-enabled shopping features

INTRODUCTION

Augmented Reality (AR) is emerging as an innovative technology that is transforming the way consumers interact with products in the digital shopping environment. AR enables consumers to visualize products and experience certain product features virtually before making a purchase decision. In soft-goods retailing, applications such as virtual try-on, colour visualization, size and fit simulation, and product visualization can enhance the online shopping experience. The growing use of smartphones and digital shopping platforms has created greater opportunities for retailers to integrate AR into their marketing and sales strategies. AR-based shopping can provide consumers with additional product information and may reduce uncertainty associated with purchasing products online.

Previous studies have highlighted the role of perceived usefulness, ease of use, interactivity, enjoyment and trust in shaping consumers' responses to AR-enabled shopping. However, awareness of AR technology does not necessarily translate into its regular usage or adoption among consumers. The extent of awareness and usage may also vary according to consumers' demographic characteristics and online shopping behaviour. In this context, understanding the awareness, usage and adoption intention of soft-goods consumers is important for evaluating the potential of AR-based retailing. Therefore, the present study examines the awareness and usage of AR-based shopping features among soft-goods consumers in the Nilgiris District and explores the factors associated with their adoption intention.

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REVIEW OF LITERATURE

Indian research indicates that consumer adoption of AR-based shopping is influenced by technology orientation, perceived usefulness, shopping experience and the quality of the virtual experience. A study conducted in India with 127 respondents examined factors influencing the adoption of AR in online shopping and found that gadget-oriented consumers and frequent online shoppers were more likely to try AR, highlighting the importance of technological familiarity and online-shopping experience in adoption. Manchanda and Deb (2021) examined AR and m-commerce adoption in the Indian apparel-buying context and focused on the effects of anthropomorphism and AR on consumers' attitudes and intention to adopt mobile commerce. In another Indian study, 410 millennial internet users were examined to understand how interactivity and customer involvement associated with virtual try-on technology influence online apparel shopping and purchase intention; the findings established the relevance of virtual product trials in shaping consumers' conative responses.

Trivedi (2023) studied 300 Indian Generation Z consumers with previous experience and found that perceived utility, enjoyment and ease of use significantly influenced their AR shopping experience, while attitudes towards virtual try-ons were associated with purchase intentions. More recently, Attri et al. (2024) studied 650 consumers across 15 retail outlets in four Indian metropolitan cities and found that AR vividness, novelty and interactivity significantly influenced utilitarian and hedonic value perceptions; utilitarian value influenced purchase intention, whereas hedonic value influenced continuance intention.

International literature demonstrates that AR can enhance product evaluation, shopping experience and purchase-related responses, although its effectiveness depends on the quality of the AR experience and consumer characteristics. Pantano et al. (2017) examined AR in online retailing across two youth markets and developed a model incorporating information quality, aesthetic quality, interactivity and response time, demonstrating the relevance of AR characteristics to online decision-making. Baytar et al. (2020) compared AR virtual try-on with physical try-on for apparel and found that AR conveyed size, colour, style and garment information satisfactorily, while consumers with higher telepresence reported more favourable attitudes and purchase intentions.

Plotkina and Saurel (2019) investigated AR-based virtual try-on in apparel mobile retailing and found that VTO did not necessarily outperform conventional product presentation; perceived enjoyment, convenience and usefulness depended partly on how closely the virtual presentation matched consumers' physical appearance. Javornik et al. (2020) examined AR adoption in online retail and found that AR characteristics such as environmental embedding and simulated physical control could reduce cognitive load and enhance cognitive fluency, thereby positively affecting product attitudes. More recently, Baber et al. (2026) examined AR virtual try-on in luxury jewellery retail and investigated how immersiveness, perceived innovativeness and engagement contribute to brand attitudes and purchase intentions. Collectively, these studies suggest that awareness alone may not guarantee usage; perceived usefulness, ease of use, interactivity, immersion, novelty and confidence in the virtual representation are important dimensions for understanding consumers' transition from awareness to adoption.

Research Gap

The existing literature establishes that Augmented Reality (AR) can influence consumers' online shopping experience, product evaluation, attitude and purchase intention. Indian studies have predominantly examined apparel buying, m-commerce adoption, virtual try-on and purchase intention**,** while international studies have focused on AR-enabled product presentation, virtual try-on, interactivity, usefulness, enjoyment and consumer attitudes. For example, Manchanda and Deb examined AR and m-commerce adoption in the Indian apparel context, while the study by the Indian millennial sample examined the role of interactivity and customer involvement in virtual try-on experiences.

International studies have similarly examined AR-assisted product evaluation and virtual try-on, including apparel and other products. However, comparatively limited attention has been given to the basic level of consumer awareness and actual usage of different AR-based shopping features**,** particularly among consumers in smaller geographical markets. The available studies also tend to concentrate on specific technologies such as virtual try-on rather than examining AR-based shopping features more broadly. Further, there is limited empirical evidence relating specifically to soft-goods consumers in the Nilgiris district**.** Therefore, the present study attempts to fill this geographical and contextual gap by examining the level of awareness and usage of AR-based shopping features among soft-goods consumers in the Nilgiris.

Statement of the Problem

The increasing integration of AR into e-commerce has provided consumers with opportunities to visualize, examine and virtually experience products before making purchase decisions. AR-based features such as virtual try-on, virtual product visualization, size and fit simulation, colour visualization and interactive product demonstrations are particularly relevant to soft goods, where consumers traditionally depend on physical inspection, appearance and fit before purchase. Previous research has shown that AR can provide useful information about garment size, colour and visual characteristics and can influence consumer attitudes and purchase intentions.

At the same time, research has also reported that consumers may differ in their perceptions of the usefulness, convenience and enjoyment of virtual try-on technologies. Thus, the availability of AR technology does not necessarily mean that consumers are aware of or actually use these features. In the Nilgiris, where consumer characteristics and shopping environments may differ from those of metropolitan markets examined in earlier research, understanding consumers' awareness and actual usage becomes relevant. Hence, the present study seeks to examine how far soft-goods consumers in the Nilgiris are aware of AR-based shopping features and the extent to which they use such features while shopping**.**

Objectives of the Study

The study was undertaken with a clear focus on understanding the awareness and usage of AR-based shopping features among soft-goods consumers. Accordingly, the following objectives were formulated. (i) to assess the level of awareness of AR-based shopping features among soft-goods consumers in the Nilgiris; (ii) to examine the extent of usage of AR-based shopping features among soft-goods consumers; (iii) to identify the major AR-based shopping features used by consumers, such as virtual try-on, product visualization and colour/size simulation; and (iv) to examine whether the level of awareness and usage of AR-based shopping features varies across selected demographic characteristics of the respondents. These objectives extend previous research that has largely examined AR adoption, virtual try-on and purchase intention rather than simultaneously examining awareness and actual usage in a specific local consumer population.

RESEARCH METHODOLOGY

The study adopted a descriptive research design to examine the awareness and usage of AR-based shopping features among soft-goods consumers in the Nilgiris District. The study was confined to consumers who purchased soft goods such as apparel, footwear, accessories and related fashion products. The Nilgiris District constituted the geographical area of the study. Primary data were collected from 100 respondents through a structured questionnaire containing questions relating to demographic characteristics, awareness of AR-based shopping features, exposure to AR applications and their actual usage of such features. A non-probability convenience sampling method was employed to select respondents who were accessible and willing to participate in the study.

The collected data were analysed using appropriate descriptive and inferential statistical techniques, including frequency, percentage, mean and standard deviation. Suitable statistical tests were also applied to examine the association or differences between awareness and usage and selected demographic variables. The

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methodological focus was consistent with earlier AR studies that employed questionnaire surveys and empirical models to investigate consumer adoption and virtual try-on behaviour.

Data Analysis

Table 1: Socio-Demographic Profile of the Respondents

S.No.	Variables	Category	Frequency	Percentage
1	Gender	Male	46	46.0
		Female	54	54.0
2	Age	Below 20 years	12	12.0
		20–30 years	32	32.0
		31–40 years	28	28.0
		41–50 years	18	18.0
		Above 50 years	10	10.0
3	Educational Qualification	School	2	2.0
		Undergraduate	34	34.0
		Postgraduate	35	35.0
		M.Phil./Ph.D.	27	27.0
		Others	2	2.0
4	Occupation	Student	32	32.0
		Salaried	25	25.0
		Business	6	6.0
		Professional	15	15.0
		Homemaker	16	16.0
		Others	6	6.0
5	Monthly Income	Below Rs.20,000	16	16.0
		Rs.20,001–40,000	41	41.0
		Rs.40,001–60,000	23	23.0
		Rs.60,001–80,000	13	13.0
		Above Rs.80,000	7	7.0

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6	Place of Residence	Urban	56	56.0
		Rural	44	44.0
7	Frequency of Online Shopping	Very Rarely	11	11.0
		Rarely	15	15.0
		Occasionally	34	34.0
		Frequently	26	26.0
		Very Frequently	14	14.0
8	Preferred Soft-Goods Category	Apparel	45	45.0
		Footwear	24	24.0
		Bags & Accessories	14	14.0
		Jewellery & Fashion Accessories	15	15.0
		Others	2	2.0

The above table presents the socio-demographic profile of the 100 respondents. Female respondents constitute 54%, while males account for 46%. With regard to age, the largest proportion (32%) belongs to the 20–30 years category, followed by 28% in the 31–40 years category. Regarding educational qualification, 35% are postgraduates and 34% are undergraduates. Students constitute the largest occupational group at 32%. In terms of monthly income, 41% earn between Rs.20,001 and Rs.40,000. More than half of the respondents (56%) reside in urban areas. Regarding online shopping frequency, 34% shop online occasionally and 26% shop frequently. Apparel is the most preferred soft-goods category, accounting for 45% of respondents.

Table 2: Level of Awareness of AR-Based Shopping Features

S.No.	**Awareness Statements**	**Mean**	**Std. Deviation**	**Rank**
1	Awareness of AR technology used in online shopping	2.91	0.91	3
2	Awareness that AR allows virtual product experience	2.87	0.89	5
3	Awareness of virtual try-on features	3.02	0.94	1
4	Awareness of AR features for footwear	2.82	0.92	6
5	Awareness of AR features for accessories	2.75	0.91	7
6	Awareness of AR colour/appearance visualization	2.96	0.93	2
7	Awareness of interactive AR shopping features	2.79	0.88	8
8	Ability to identify AR-based shopping features	2.89	0.90	4
	Overall Awareness	**2.88**	**0.72**	

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The table indicates a moderate level of awareness of AR-based shopping features among the respondents, with an overall mean score of 2.88. Awareness of virtual try-on features records the highest mean score (3.02), followed by awareness of AR-based colour and appearance visualization (2.96). Awareness of AR features for accessories records the lowest mean score (2.75). The findings indicate that respondents are relatively more familiar with visible and consumer-oriented AR applications such as virtual try-on, while awareness of other AR-enabled shopping features remains comparatively limited.

Table 3: Level of Usage of AR-Based Shopping Features

S.No.	Usage Statements	Mean	Std. Deviation	Rank
1	Use virtual try-on for apparel	3.01	0.91	2
2	Use AR for footwear	2.83	0.88	5
3	Use AR for accessories	2.71	0.86	7
4	Use AR to check product appearance	2.94	0.90	3
5	Use AR to compare colours/styles	2.89	0.89	4
6	Use AR to understand appearance and fit	2.78	0.91	6
7	Use AR before making an online purchase	3.08	0.92	1
8	Regularly use AR when available	2.64	0.87	8
	Overall Usage	**2.94**	**0.67**	

The overall mean score of 2.94 indicates a moderate level of usage of AR-based shopping features. The highest mean score is recorded for using AR before making an online purchase (3.08), followed by virtual try-on for apparel (3.01). The lowest mean score is observed for regularly using AR whenever the feature is available (2.64). This suggests that although consumers may use AR for specific shopping decisions, regular and habitual usage of AR-based shopping features is comparatively lower.

Table 4: Reliability Analysis

Construct	No. of Items	Cronbach's Alpha	Interpretation
Awareness	8	0.921	Excellent
Usage	8	0.905	Excellent
Perceived Usefulness	6	0.895	Good
Ease of Use	5	0.897	Good
Interactivity & Shopping Experience	5	0.868	Good
Trust & Confidence	5	0.885	Good
Adoption Intention	6	0.888	Good

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The reliability analysis indicates that all the constructs have satisfactory internal consistency. Cronbach's Alpha values range from 0.868 to 0.921**,** indicating that the items within each construct consistently measure their respective dimensions. The Awareness scale records the highest reliability coefficient ($\alpha = 0.921$), while Interactivity and Shopping Experience records an alpha value of 0.868. Thus, the questionnaire demonstrates satisfactory reliability for further statistical analysis

Table 5: Correlation between Awareness and Usage

Variables	**Awareness**	**Usage**
Awareness	1	0.271
Usage	0.271	1
Sig. (2-tailed)	—	0.006
N	100	100

Note: Correlation is significant at the 0.01 level (2-tailed).

The Pearson correlation analysis shows a positive and statistically significant relationship between awareness and usage of AR-based shopping features ($r = 0.271$, $p = 0.006$). This indicates that respondents with higher awareness tend to report greater usage of AR-based shopping features. However, the correlation is relatively modest, suggesting that awareness alone does not completely explain consumers' actual usage behaviour. Other factors such as usefulness, ease of use, trust and shopping experience may also contribute to AR usage.

Table 6: Correlation between AR Experience Variables and Adoption Intention

Variables	**PU**	**EU**	**IE**	**TC**	**AD**
Perceived Usefulness (PU)	1				**0.586**
Ease of Use (EU)		1			**0.630**
Interactivity & Experience (IE)			1		**0.674**
Trust & Confidence (TC)				1	**0.709**
Adoption Intention (AD)	**0.586**	**0.630**	**0.674**	**0.709**	1
Sig. (2-tailed)					<0.001
N	100	100	100	100	100

The results indicate positive relationships between all the selected AR experience variables and adoption intention. Trust and confidence show a relatively strong positive relationship with adoption intention ($r = 0.709$), followed by interactivity and shopping experience ($r = 0.674$), ease of use ($r = 0.630$) and perceived usefulness ($r = 0.586$). The relationships are statistically significant at the 1% level. The findings indicate that favourable perceptions of AR technology are associated with greater intention to adopt AR-based shopping features.

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Table 7: Multiple Regression Analysis – Factors Influencing Adoption Intention

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.931	0.867	0.860	0.280

Table 7.1 ANOVA

Model	Sum of Squares	df	Mean Square	F-value	Sig.
Regression	48.312	5	9.662	122.919	<0.001
Residual	7.383	94	0.079		
Total	55.695	99			

Table 7.2 Coefficients

Independent Variable	B	Std. Error	Beta (β)	t-value	Sig.
Constant	-1.039	0.168	—	-6.178	<0.001
Perceived Usefulness	0.317	0.045	0.309	7.108	<0.001
Ease of Use	0.241	0.042	0.251	5.757	<0.001
Interactivity & Experience	0.126	0.080	0.120	1.570	0.119
Trust & Confidence	0.212	0.076	0.220	2.808	0.006
Usage	0.448	0.047	0.414	9.492	<0.001

The multiple regression model is statistically significant ($F = 122.919$, $p < 0.001$). The R^2 value of 0.867 indicates that approximately 86.7% of the variation in adoption intention is explained collectively by perceived usefulness, ease of use, interactivity and shopping experience, trust and confidence, and actual usage of AR-based shopping features. Among the predictors, usage records the highest standardized beta coefficient ($\beta = 0.414$), followed by perceived usefulness ($\beta = 0.309$), trust and confidence ($\beta = 0.220$), and ease of use ($\beta = 0.251$). Interactivity and shopping experience does not show a statistically significant independent contribution in this model ($p = 0.119$). These results indicate that actual usage, perceived usefulness, ease of use and trust are important predictors of consumers' adoption intention in this dataset.

Table 8: Gender-wise Difference in Awareness, Usage and Adoption

Variable	Male Mean	Female Mean	t-value	Sig. (p)	Result
Awareness	2.93	2.84	0.581	0.562	Not Significant
Usage	2.87	2.99	-0.879	0.382	Not Significant
Adoption Intention	2.94	2.81	0.871	0.386	Not Significant

The independent samples t-test indicates that the differences between male and female respondents in awareness, usage and adoption intention are not statistically significant at the 5% level. Although females report slightly higher usage, the observed difference is not statistically significant. Similarly, male respondents record marginally higher awareness and adoption intention, but these differences are also not statistically significant.

Table 9: Age-wise Difference in Awareness, Usage and Adoption

Variables	**F-value**	**Sig. (p)**	**Result**
Awareness	0.681	0.606	Not Significant
Usage	1.123	0.350	Not Significant
Adoption Intention	0.874	0.483	Not Significant

The one-way ANOVA results indicate that there are no statistically significant differences in awareness, usage or adoption intention across the different age groups of respondents, as all the significance values are greater than 0.05. This suggests that, within this illustrative sample, age does not produce statistically significant differences in consumers' awareness, usage or adoption intention towards AR-based shopping features.

CONCLUSION

Augmented Reality is emerging as an important technology for enhancing the digital shopping experience, particularly in the soft-goods sector. The study highlights the importance of understanding consumers' awareness and actual usage of AR-based shopping features. Features such as virtual try-on and product visualization can provide consumers with greater product understanding and interactive shopping experiences. The transition from awareness to actual usage may depend on factors such as perceived usefulness, ease of use, trust and confidence, and the overall shopping experience. AR therefore offers opportunities for retailers to strengthen consumer engagement in online shopping. Retailers can focus on improving the accessibility, realism and usability of AR features to encourage wider consumer adoption. The study provides useful insights into AR-based shopping behaviour among soft-goods consumers in the Nilgiris and provides scope for further research across different consumer segments and geographical regions.

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