

ARTIFICIAL INTELLIGENCE AND APPAREL DECISION-MAKING: AN EMPIRICAL STUDY OF THE ALGORITHMIC CONSUMER IN COIMBATORE DISTRICT

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Abstract—This study introduces and empirically examines the concept of the "algorithmic consumer" — a consumer whose apparel-buying journey is increasingly mediated, augmented, and shaped by artificial intelligence (AI). Drawing on primary data collected from 402 apparel shoppers in Coimbatore District through a stratified random sample of four generational cohorts (Gen Z, Gen Y, Gen X, and Boomers), the study profiles consumer awareness of AI features, ranks the antecedents driving AI acceptance, identifies consumer concerns, and tests how the algorithmic consumer profile varies across educational qualification, gender, and household income using One-Way ANOVA, and Friedman rank tests. Findings show that educational qualification and monthly household income significantly shape several dimensions of AI engagement including trust in AI recommendations, chatbot-assisted purchasing, and responsiveness to AI-based offers while gender exerts a more selective influence, concentrated in trust and purchase-related interactions. Friedman tests reveal that consumers value AI primarily for the efficiency and product discovery it affords, rather than for interface usability, while data privacy, image-sharing discomfort in virtual try-on, and intrusive advertising emerge as the leading consumer concerns. The study contributes a tier-2, apparel-sector-specific evidence base to the consumer-AI literature and offers practical direction for retailers and policymakers seeking to design trustworthy, generationally responsive, and privacy-sensitive AI features in Indian apparel retail.

Keywords: Artificial Intelligence, Algorithmic Consumer, Apparel Retail.

INTRODUCTION

Artificial intelligence has moved from the periphery of consumer markets to their operational core. Within a decade, recommendation engines, conversational agents, computer-vision systems, augmented-reality interfaces, and generative models have become the substrate on which contemporary retail experiences are designed and delivered. What once appeared as discrete, novelty-driven features — a single chatbot, a personalised banner, an experimental virtual try-on — now constitutes a dense web of algorithmic intermediation that surrounds the consumer at every stage of the buying journey (Lemon and Verhoef, 2016). The consumer is no longer simply a user of digital platforms; increasingly, the consumer is the subject of an algorithmic apparatus that suggests, predicts, filters, persuades, and at times completes choices on her behalf. Few sectors illustrate this transition more vividly than apparel retail. Apparel decisions are simultaneously visual, emotional, identity-driven, and preference-rich, which makes the category uniquely receptive to AI integration. Recommendation engines exploit historical browsing and purchase patterns to surface personalised assortments; virtual try-on tools and augmented-reality mirrors let consumers visualise garments on their own bodies before purchase (Tang, Lau and Ho, 2023); AI-powered visual search allows shoppers to locate similar items from a single photograph; generative styling assistants propose outfits and combinations in real time; and AI sizing engines predict fit, addressing one of the structural constraints — elevated return rates — that has historically limited online apparel growth. Each of these features reshapes the texture of the apparel decision in ways that traditional consumer-behaviour frameworks were not designed to capture.

India occupies a particularly significant position in this transformation. The country is among the world's largest e-commerce markets, with smartphone users exceeding seven hundred million and UPI transactions surpassing ten billion per month. Platform-led apparel retailers — Myntra, Ajio, Flipkart, Amazon Fashion, Meesho, Nykaa Fashion, and a growing layer of social-commerce entrants — have brought AI-driven personalisation to the mass market, a shift accelerated since 2023 by generative AI capabilities that extend algorithmic influence from product discovery into styling, sizing, and post-purchase engagement. Yet the Indian consumer base is highly heterogeneous across generational cohorts, urban and rural settings, and regional style sensibilities, which means that understanding how AI actually shapes apparel decision-making requires moving beyond metropolitan generalisations to examine specific regional contexts in depth.

Coimbatore District offers a particularly fertile site for such an inquiry. Historically known as the "Manchester of South India," the district anchors one of South Asia's most significant apparel ecosystems, supported by the neighbouring knitwear cluster of Tirupur, India's knitwear capital. Coimbatore's retail landscape spans traditional silk and saree houses (Pothys, Chennai Silks, RmKV), branded national chains (Reliance Trends, Lifestyle, Westside), a dense layer of small and medium apparel businesses, and the full range of platform-led online retailers — while its consumer base spans Gen Z, Gen Y, Gen X, and Boomer generations across urban, semi-urban, and rural settings. This combination of sectoral depth, an accessible respondent base, and meaningful demographic variation makes Coimbatore an analytically rich location for studying the consumer-side experience of AI in apparel retail. Against this backdrop, the present study introduces and investigates the concept of the algorithmic consumer: a consumer whose decision architecture, across the apparel-buying journey, is increasingly mediated, augmented, and shaped by artificial intelligence. The construct draws on an emerging body of work examining how individuals respond to algorithmic recommendation, advice, and decision-making (Longoni, Bonezzi and Morewedge, 2019; Castelo, Bos and Lehmann, 2019; Yeomans, Shah, Mullainathan and Kleinberg, 2019). The study examines how this mediation operates across the apparel decision journey, what factors drive its acceptance, and how the resulting behaviour varies across generational, demographic, and behavioural segments within Coimbatore District.

Review of Literature

Recent studies highlight the growing influence of AI-enabled technologies on consumer behaviour in online apparel shopping. Gao and Liang (2025) found that AI-powered virtual try-on features such as visual vividness, interactive control, personalization and ease of use positively influence impulsive buying intention, with perceived value and immersion acting as mediators. Nguyen et al. (2025) reported that perceived enjoyment, usefulness and ease of use enhance attitudes towards virtual try-on, while privacy risk negatively affects adoption. Jeong and Kim (2025) identified significant generational differences in AI fashion-curation adoption, with Generation Z showing greater sensitivity to technological fit and usefulness. Qi, Ko and Cho (2025) demonstrated that AI chatbots with visual search improve luxury-fashion shopping intentions through perceived usefulness and ease of use, with prior chatbot experience playing a moderating role. Akter et al. (2025) revealed that virtual try-on enhances perceived usefulness, curiosity, control and joy, although perceived usefulness did not directly lead to actual adoption. Overall, these studies establish that AI features, perceived value, technology experience, generational characteristics and user perceptions significantly shape online apparel decision-making.

STATEMENT OF THE PROBLEM

The literature on digital marketing has expanded rapidly in the post-pandemic period, but the bulk of this scholarship is framed from a business-adoption perspective — examining how firms adopt digital tools, how SMEs integrate online channels, and how organisational capabilities mediate the value of digital marketing investment. This leaves a significant gap: the consumer's lived experience of an increasingly algorithmic retail environment remains comparatively under-researched, particularly in tier-2 Indian urban settings where the algorithmic consumer is taking shape rapidly but has not yet been characterised in the scholarly literature. Within apparel retail specifically, the gap is sharper still. Apparel is one of the most heavily AI-integrated consumer categories in India, yet most empirical work continues to study aggregate adoption trends, platform-level metrics, or business strategy, rather than the cognitive, affective, and behavioural processes by which consumers actually engage with AI features when making apparel decisions. Questions of trust in algorithmic recommendations, privacy concerns around image-based virtual try-on, the influence of personalised feeds on consideration sets, and the differential response of generational cohorts to AI-mediated choice remain under-examined in the Indian context — and where they are addressed, the evidentiary base typically draws on metropolitan respondents, leaving tier-2 districts such as Coimbatore under-represented despite their sectoral importance. Existing technology-acceptance frameworks such as the Technology Acceptance Model (Davis, 1989) and the Unified Theory of Acceptance

and Use of Technology (Venkatesh, Morris, Davis and Davis, 2003) provide useful baseline scaffolding but were developed prior to the current generation of consumer-facing AI features, and do not directly capture algorithm-specific psychological phenomena such as algorithm aversion or algorithm appreciation.

SIGNIFICANCE OF THE STUDY

The significance of this study is empirical, theoretical, and practical. Empirically, it foregrounds the consumer's lived experience of algorithmic intermediation in a tier-2 Indian district, moving beyond the business-adoption lens that dominates existing literature. Theoretically, it integrates acceptance frameworks (TAM, UTAUT) with algorithm-aversion/appreciation theory and the consumer decision-journey framework within a single design, offering a conceptual contribution to behavioural and consumer research. Practically, the findings can guide apparel retailers, e-commerce platforms, and policymakers in designing AI features — personalisation, virtual try-on, chatbots, sizing engines — that are trustworthy, generationally responsive, and sensitive to consumer concerns around privacy and data use. By documenting the algorithmic consumer at the point of mainstream emergence in Coimbatore, the study also establishes a reference baseline against which future, longitudinal transformation in AI-mediated apparel retail can be assessed.

NEED FOR THE STUDY

The need for this study arises from a convergence of empirical, theoretical, contextual, and practical considerations:

- **Empirical gap in consumer-side AI research** — the consumer's lived experience of algorithmic intermediation remains under-researched, particularly in tier-2 Indian settings, because the dominant business-adoption lens treats the consumer as a recipient of strategy rather than an active interpreter of algorithmic mediation.
- **Sectoral and regional specificity of apparel retail in Coimbatore** — the district's multi-channel apparel ecosystem, anchored by Tirupur's knitwear cluster, has received negligible attention in the consumer-AI literature despite its economic weight.
- **Theoretical need for an integrated framework** — TAM, UTAUT, algorithm-aversion/appreciation theory, and the consumer decision journey each capture a different dimension of AI engagement but have rarely been combined in a single Indian apparel study.
- **Generational and demographic heterogeneity** — digital readiness, AI exposure, and decision orientation differ markedly across Gen Z, Gen Y, Gen X, and Boomer cohorts, a variation aggregate national studies are rarely powered to disentangle.
- **Practical need for evidence-based retail design** — retailers and policymakers currently design AI features, vernacular adaptation, and privacy disclosure on the basis of metropolitan or platform-level data rather than tier-2-specific evidence.
- **Future-orientation of the algorithmic consumer** — generative-AI styling, automated fit prediction, and algorithmic personalisation are projected to deepen substantially, making a rigorous empirical baseline today valuable for future longitudinal comparison.

OBJECTIVES OF THE STUDY

- To examine AI engagement among apparel consumers in Coimbatore District.
- To identify the factors influencing AI acceptance and consumer concerns in apparel shopping.
- To analyse demographic differences in the algorithmic consumer profile.

RESEARCH METHODOLOGY

The study adopts a descriptive and analytical research design with a mixed-methods orientation and a strong quantitative core. The descriptive component profiles the algorithmic consumer in Coimbatore's apparel retail sector; the analytical component tests hypothesised relationships among AI exposure, antecedent factors, decision outcomes, and segment-level variation using inferential statistics, supplemented by qualitative insight from semi-structured key-informant interviews. The population comprises adult apparel consumers residing in Coimbatore District who engaged with apparel retail — physical, online, or omnichannel — within the twelve months preceding data collection. A stratified random sampling design was used, with generational age cohorts as the stratification basis, since generational variation is theoretically central to algorithmic engagement. A total sample of 402 respondents was drawn, with respondents distributed across four generational cohorts — Gen Z (18–25 years), Gen Y (26–41 years), Gen X (42–62 years), and

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Boomers (63 years and above) — with balanced representation across urban, semi-urban, and rural areas within each stratum. This stratification provides adequate statistical power for chi-square analysis, between-cohort ANOVA, exploratory factor analysis, and regression diagnostics. Primary data were collected through a structured questionnaire administered in both physical and online (Google Forms) modes to widen reach across urban, semi-urban, and rural respondents. A pilot study preceded full-scale administration to test the clarity, reliability, and validity of the instrument, with minor refinements made accordingly. Secondary data were drawn from published journal articles, conference proceedings, books, industry and market reports, and reputable online sources on artificial intelligence, apparel retailing, and consumer behaviour, informing the problem formulation, instrument design, and interpretation of primary findings. One-Way Analysis of Variance (ANOVA) was used to test variation in the algorithmic consumer profile across educational qualification, gender, and monthly household income; the Friedman Test was used to rank the positive antecedents of, and concerns about, AI acceptance in apparel decision-making.

ANALYSIS AND INTERPRETATION

I. Educational Qualification and the Algorithmic Consumer Profile

A One-Way ANOVA was used to test whether the algorithmic consumer profile differs significantly by respondents' highest educational qualification.

Dimension	F	Sig.
Awareness of AI Features	4.158	.006
Identification of AI Recommendations	12.262	.000
Experience with AI Shopping Tools	4.250	.006
AI Helps Product Search	1.813	.144
AI Helps Discover Brands	4.754	.003
AI Influences Browsing Behaviour	4.949	.002
Use of AI for Product Evaluation	1.191	.313
Trust in AI Recommendations	6.245	.000
AI Helps Product Comparison	4.374	.005
AI Chatbot Purchase Assistance	8.462	.000
Influence of AI-Based Offers	18.483	.000
Impact of AI Alerts and Recommendations	1.958	.120
AI-Driven Advertisement Reminder	26.235	.000
AI Customer Support Assistance	4.885	.002
AI Notifications and Brand Engagement	9.064	.000

Source: Primary data

Educational qualification significantly influences most dimensions of the algorithmic consumer profile, including awareness of AI features, identification of AI recommendations, trust in AI recommendations, chatbot-assisted purchasing, responsiveness to AI-based offers, and reaction to AI-driven advertisement reminders (all $p < .05$). No significant differences emerge for AI-assisted product search ($p = .144$), use of AI for product evaluation ($p = .313$), or the impact of AI alerts and recommendations ($p = .120$). Overall, educational qualification plays an important role in shaping consumers' awareness, trust, interaction, and engagement with AI-enabled apparel shopping, though its influence is not uniform across all dimensions.

II. Gender and the Algorithmic Consumer Profile

Dimension	F	Sig.
Awareness of AI Features	.001	.978
Identification of AI Recommendations	6.629	.010
Experience with AI Shopping Tools	3.359	.068
AI Helps Product Search	.016	.898
AI Helps Discover Brands	3.144	.077
AI Influences Browsing Behaviour	.048	.826
Use of AI for Product Evaluation	1.803	.180
Trust in AI Recommendations	10.490	.001
AI Helps Product Comparison	5.032	.025
AI Chatbot Purchase Assistance	6.083	.014
Influence of AI-Based Offers	4.055	.045
Impact of AI Alerts and Recommendations	1.889	.170
AI-Driven Advertisement Reminder	1.709	.192
AI Customer Support Assistance	1.726	.190
AI Notifications and Brand Engagement	1.298	.255

Source: Primary data

Gender shows a statistically significant, but selective, influence — confined to identification of AI recommendations, trust in AI recommendations, AI-assisted product comparison, AI chatbot purchase assistance, and influence of AI-based offers (all $p < .05$). No significant gender differences emerge for awareness of AI features, experience with AI shopping tools, product search, brand discovery, browsing behaviour, product evaluation, alerts, advertisement reminders, customer support, or brand-engagement notifications. This suggests gender differentiates consumers mainly in trust- and purchase-related engagement with AI, rather than in baseline awareness or exposure.

III. Monthly Household Income and the Algorithmic Consumer Profile

Dimension	F	Sig.
Awareness of AI Features	2.008	.093
Identification of AI Recommendations	3.432	.009
Experience with AI Shopping Tools	2.171	.072
AI Helps Product Search	.605	.659
AI Helps Discover Brands	2.604	.036
AI Influences Browsing Behaviour	2.151	.074
Use of AI for Product Evaluation	2.832	.024
Trust in AI Recommendations	2.423	.048
AI Helps Product Comparison	1.121	.346
AI Chatbot Purchase Assistance	6.291	.000

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Influence of AI-Based Offers	6.527	.000
Impact of AI Alerts and Recommendations	3.538	.007
AI-Driven Advertisement Reminder	10.140	.000
AI Customer Support Assistance	2.917	.021
AI Notifications and Brand Engagement	5.845	.000

Source: Primary data

Monthly household income significantly influences ten of the fifteen dimensions tested — most notably identification of and trust in AI recommendations, chatbot purchase assistance, influence of AI-based offers, advertisement reminders, and brand-engagement notifications (all $p < .05$). No significant income-based differences emerge for awareness of AI features, experience with AI shopping tools, product search, browsing behaviour, or product comparison. Income therefore shapes the *transactional and promotional* dimensions of AI engagement — offers, chatbots, alerts, advertising — more strongly than it shapes baseline awareness or exposure.

IV. Friedman Test: Ranking of Positive Factors Influencing AI Acceptance

Chi-Square = 353.291, df = 7, Asymp. Sig. = .000 (N = 402)

Factor	Mean Rank
AI makes apparel shopping more efficient	6.07
AI helps discover new apparel items	5.00
Social influence encourages AI-based apparel shopping	4.78
AI tools save shopping time	4.63
AI improves the quality of apparel choices	4.54
AI recommendations are accurate and reliable	3.93
AI features are easy to use	3.86
AI-driven apparel apps are user-friendly and intuitive	3.19

Source: Primary data

The significant Chi-Square value (353.291, $p < .001$) confirms that consumers do not weigh these factors equally. Efficiency is the strongest driver of AI acceptance, followed by product discovery and social influence; ease of use and app interface quality — the classic TAM constructs — rank lowest. This indicates that Coimbatore's apparel consumers accept AI primarily for functional, outcome-oriented reasons rather than for interface usability, a pattern with implications for how retailers prioritise feature investment.

V. Friedman Test: Ranking of Concerns and Preferences Related to AI Usage

Chi-Square = 101.631, df = 7, Asymp. Sig. = .000 (N = 402)

Factor	Mean Rank
Concern about collection of personal data	5.02
Discomfort in sharing photos for virtual try-on	4.91
AI-driven advertisements feel intrusive	4.87
Worry about browsing data being tracked	4.63
Doubts about fairness and unbiased AI decisions	4.53
Preference for human stylist advice over AI suggestions	4.39

Skepticism about AI understanding personal apparel taste	3.85
Lack of confidence in AI-based size and fit predictions	3.80

Source: Primary data

The significant Chi-Square value (101.631, $p < .001$) confirms meaningful differentiation among consumer concerns. Data-privacy concern ranks highest, followed closely by discomfort with image-based virtual try-on and intrusive advertising — together indicating that privacy and personal-image sensitivity are the dominant barriers to AI acceptance. Concerns about algorithmic fairness and preference for human stylists occupy a middle tier, while scepticism about taste-understanding and fit-prediction confidence rank lowest, suggesting consumers are less troubled by AI's functional accuracy than by its data practices.

FINDINGS

- Educational qualification and monthly household income are the two demographic variables with the broadest influence on the algorithmic consumer profile, each significantly shaping around two-thirds of the dimensions tested.
- Gender's influence is narrower but concentrated precisely where it matters commercially — trust, comparison, chatbot use, and response to offers.
- Consumers are drawn to AI in apparel shopping chiefly for efficiency and discovery, not interface polish — a reversal of the usability-centred assumptions embedded in classical technology-acceptance models.
- Data privacy, not algorithmic competence, is the primary source of consumer hesitation, with virtual try-on's image-sharing requirement a specific point of discomfort.
- Together, these results suggest that Coimbatore's algorithmic consumer is pragmatic and outcome-focused in adoption, but privacy-conscious and selectively trusting in engagement — a profile that existing acceptance frameworks (TAM, UTAUT) do not fully anticipate.

CONCLUSION

This study set out to characterise the algorithmic consumer within Coimbatore District's apparel retail sector — a tier-2 Indian context of considerable sectoral importance that has remained largely absent from the consumer-AI literature. The evidence indicates that artificial intelligence is not experienced uniformly across Coimbatore's apparel shoppers: educational qualification and household income meaningfully differentiate how consumers identify, trust, and transact through AI features, while gender exerts a narrower but commercially significant influence on trust and purchase-related engagement. Consumers accept AI primarily because it makes shopping more efficient and helps them discover new items, rather than because AI interfaces are easy or pleasant to use — a finding that should temper retailers' emphasis on interface design relative to functional value delivery. At the same time, concerns about personal-data collection, discomfort with image-based virtual try-on, and intrusive advertising represent the most significant barriers to deeper AI adoption, ahead of doubts about AI's functional competence. For retailers, platforms, and policymakers, this suggests that the path to a more fully algorithmic apparel retail environment in tier-2 India runs less through improving AI accuracy or interface design, and more through demonstrably trustworthy data practices, transparent image-handling in virtual try-on, and communication that foregrounds the efficiency benefits AI already delivers. As generative AI styling, automated fit prediction, and algorithmic personalisation continue to deepen, the findings from this study offer an empirical baseline against which the evolving Coimbatore algorithmic consumer can be tracked in future research.

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