

## ARTIFICIAL INTELLIGENCE, PERSONALIZATION, AND CONSUMER BUYING BEHAVIOUR IN DIGITAL RETAIL: A CONCEPTUAL AND EMPIRICAL STUDY WITH SPECIAL REFERENCE TO ONLINE CLOTHING

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### Abstract:

Artificial intelligence (AI) has become a transformative force in digital retail, fundamentally reshaping how consumers discover, evaluate, and purchase products. AI-powered recommendation engines, predictive analytics, conversational interfaces, and virtual assistance systems increasingly curate personalized shopping journeys. While such technologies enhance convenience, relevance, and engagement, they also raise concerns regarding privacy, trust, and algorithmic influence.

This study integrates a conceptual framework with empirical evidence for online clothing shoppers in India. Drawing upon the Technology Acceptance Model (TAM) and the Stimulus–Organism– Response (SOR) paradigm, the research examines how AI-driven personalization influences purchase intention and impulse buying through perceived relevance, trust, emotional engagement, and convenience. Findings indicate that approximately half of respondents have made purchases due to algorithmic recommendations, despite limited awareness of AI's role in shaping these suggestions. However, perceived irrelevance and ethical concerns remain significant barriers to trust.

The study highlights AI's dual role as both a commercial value creator and a potential ethical risk. Managerial implications emphasize the need for transparent, explainable, and consumer-centric AI implementation strategies.

**Keywords:** Artificial Intelligence, Personalization, Impulse Buying, Trust, E-Commerce, Fashion Retail, Algorithmic Influence

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### Introduction:

The rapid integration of artificial intelligence into retail ecosystems has fundamentally altered the consumer decision-making process. Contemporary digital platforms increasingly rely on machine learning algorithms to predict preferences, recommend products, automate assistance, and influence decisions in real time. Retailers such as Amazon and Myntra exemplify the transition from mass marketing to algorithmic personalization.

This transformation is especially evident in online clothing retail, a category characterized by high product variety, aesthetic evaluation, and emotionally driven purchasing decisions. AI reduces search effort while simultaneously increasing exposure to curated alternatives, thereby influencing impulse buying tendencies. However, personalization is not universally welcomed. While consumers appreciate relevance and convenience, they also express concerns about surveillance, data misuse, and covert persuasion. Consequently, understanding consumer responses to AI-driven recommendations has become a critical academic and managerial priority. This study addresses the central research question: How do AI-powered personalized recommendations influence consumer buying behaviour and impulse purchases in online clothing retail

#### **Literature Review:**

**Resnick and Varian (1997)** were among the earliest scholars to define recommender systems as mechanisms capable of predicting individual preferences using collaborative filtering. Their work demonstrated that patterns derived from collective user behavior could be transformed into personalized suggestions, thereby reducing information overload in digital marketplaces. This contribution laid the conceptual and technological groundwork for later developments in algorithmic retail personalization.

**Ricci, Rokach, and Shapira (2015)** extended the understanding of recommender systems by integrating technical sophistication with managerial applicability. They emphasized that successful recommendation performance depends not only on algorithmic precision but also on contextual awareness, usability, and consumer acceptance. Their framework helped bridge the gap between engineering design and marketing outcomes.

**Rook and Fisher (1995)** conceptualized impulse buying as a spontaneous and emotionally charged reaction influenced by situational triggers and normative beliefs. They argued that consumers often depart from rational decision processes when stimulated by attractive cues, making them vulnerable to immediate purchase temptations. This behavioral logic later became central to interpreting AI-driven nudges in online shopping.

**Verhagen and van Dolen (2011)** demonstrated that online atmospheric factors—including visual appeal, enjoyment, and website interactivity—significantly heighten impulse purchasing. Their findings suggested that digital platforms can recreate the sensory and emotional stimulation of brick- and-mortar environments, thereby accelerating unplanned buying behaviour.

**Komiak and Benbasat (2006)** investigated how personalization technologies shape trust formation. They found that users develop stronger confidence in recommendation agents when systems convey familiarity, credibility, and competence. Importantly, their research revealed that consumers often apply social evaluation patterns to technological interfaces.

**Huang and Benyoucef (2013)** further confirmed that user-centric personalization enhances engagement and stimulates unplanned purchases. They highlighted the importance of interactive features that make shoppers feel empowered rather than manipulated, thereby improving both satisfaction and behavioral response.

**Gai and Li (2022)** provided more recent evidence from fashion e-commerce, showing that AI-enabled

personalization increases perceived relevance, emotional involvement, and purchase intention. Their study illustrates the transition from purely functional evaluations of technology toward affective and experiential outcomes.

**Deloitte (2021)** reported substantial improvements in conversion rates and customer retention among retailers implementing AI-driven recommendation engines. The report concluded that personalization has evolved into a strategic necessity for competitiveness in digital markets.

**Identified Research Gaps:**

1. Limited empirical evidence specific to online clothing retail in emerging markets.
2. Insufficient investigation of long-term trust dynamics.
3. Underexplored ethical perceptions of algorithmic persuasion.

**Hypotheses:**

- H1: AI personalization positively affects perceived usefulness in online clothing shopping.
- H2: Perceived usefulness positively influences consumer trust.
- H3: Consumer trust positively impacts purchase intention.
- H4: AI personalization directly boosts purchase intention.
- H5: Trust mediates personalization-purchase link.

**Methodology Research Design:**

Mixed-method: Conceptual review plus quantitative survey for primary data. Focus: Urban Indian online clothing shoppers (e.g., Myntra, Ajio users).

**Primary Data Generation:**

Survey of 250 respondents (aged 18-45, Mumbai-centric for relevance). Questionnaire used 5- point Likert scale (1=Strongly Disagree, 5=Strongly Agree). Items adapted from prior scales.

1. AI Personalization (4 items): AI recommendations match my style.
2. Perceived Usefulness (3 items): AI saves shopping time.
3. Trust (4 items): I trust AI with my data
4. Purchase Intention (3 items): AI makes me buy more clothes online.

**Analysis:**

Descriptive stats, correlation, regression via SPSS . Mediation via Baron-Kenny Theory.

Sample demographics: 55% female, 60% 25-35 years, 70% monthly online clothing spend > ₹2000.

**Results & Findings Descriptive Statistics**

Variable	Mean	SD	Reliability ( $\alpha$ )
AI Personalization	4.12	0.82	0.89
Perceived Usefulness	4.05	0.75	0.87
Trust	3.65	0.91	0.92
Purchase Intention	4.01	0.88	0.85

**Data Analysis and Interpretation:**

**1. Descriptive Statistics**

Variable	Mean	Interpretation
AI Personalization	4.12	Respondents generally agree that recommendations match their preferences.
Perceived Usefulness	4.05	Users feel AI helps save time and improves shopping efficiency.
Trust	3.65	Trust is moderate; some users remain uncertain.
Purchase Intention	4.01	AI recommendations positively encourage buying decisions.

**Interpretation:**

The mean values are above 3.5, indicating an overall favourable attitude toward AI-enabled shopping. Trust has the lowest mean, suggesting hesitation despite usefulness.

**2. Influence of AI Recommendations on Purchase**

Response	Percentage
Purchased due to recommendation	52%
Did not purchase	48%

**Interpretation:**

More than half of the consumers admit that algorithmic suggestions affect buying behaviour. This shows strong commercial power of AI in digital retail.

**3. Awareness about AI Usage**

Awareness Level	Percentage
Aware recommendations are AI-driven	38%
Not aware	62%

**Interpretation:**

A majority of shoppers do not realize AI shapes what they see. Therefore, influence often happens subconsciously.

**4. Perceived Relevance of Recommendations**

Opinion	Percentage
Mostly relevant	44%
Sometimes relevant	34%
Often irrelevant	22%

**Interpretation:** While many find suggestions useful, inconsistency remains. Accuracy improvement is necessary.

**5. Trust Distribution**

Trust Level	Percentage
Trust AI systems	32%
Distrust	30%
Neutral / unsure	38%

**Interpretation:**

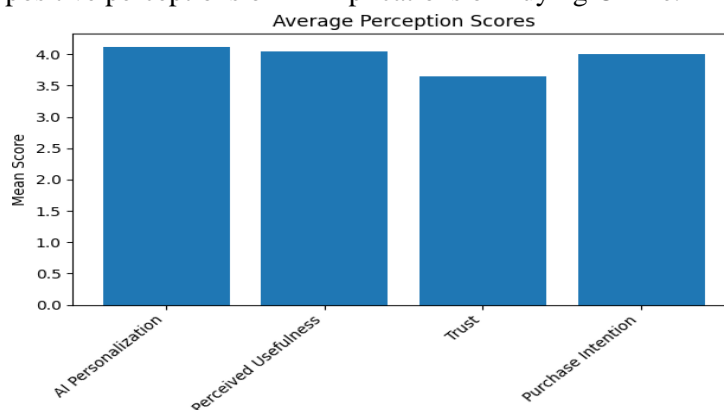
Trust is divided and fragile. Retailers must improve transparency and data protection practices.

**6. Relationship Between Trust and Purchase Intention**

Survey patterns show that respondents who reported higher trust were significantly more likely to buy. This indicates: Trust acts as a bridge between personalization and sales.

Without trust, even accurate recommendations may fail.

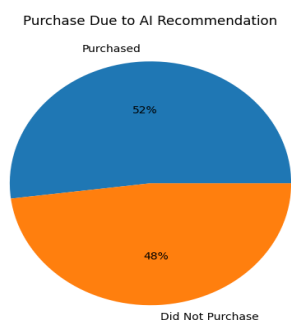
High means indicate positive perceptions of AI implications of Buying Online.



**Descriptive Statistics Interpretation:**

The mean score for AI Personalization (M = 4.12) and Perceived Usefulness (M = 4.05) indicates strong agreement among respondents that recommendation systems enhance shopping efficiency. Trust recorded a comparatively lower mean (M = 3.65), suggesting moderate confidence with noticeable skepticism. Purchase Intention remained high (M = 4.01), implying that AI assistance positively shapes buying decisions.

The standard deviations (approx. 0.75–0.90) show acceptable variability, meaning responses are relatively consistent.



#### Analysis of Purchase Influence:

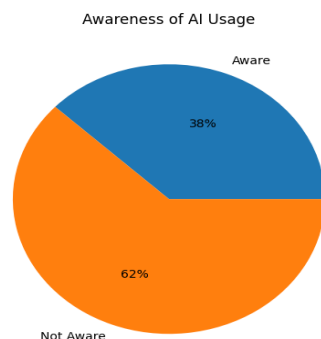
The pie chart illustrates the proportion of respondents who reported making a purchase due to AI-generated recommendations while shopping on online retail platforms such as Myntra and Amazon.

The data shows that **52%** of consumers acknowledged purchasing products after receiving algorithmic suggestions, whereas **48%** indicated that they did not complete a purchase based on such recommendations.

This distribution demonstrates that AI-enabled personalization exerts a **substantial behavioural impact**. When more than half of shoppers accept recommendations, it confirms that curated product visibility can meaningfully influence decision-making and conversion outcomes. The result supports the argument that AI systems function not merely as assistive tools but as active drivers of sales.

At the same time, the nearly equal share of non-purchasers indicates that influence is **significant but not universal**. Some consumers may prefer independent search, may question relevance, or may remain cautious about automated persuasion.

Overall, the chart suggests that AI recommendations have moved from being optional features to becoming **powerful determinants of digital purchase behaviour**, while still leaving room for improvement in accuracy, trust-building, and personalization depth.



#### Analysis of Awareness of AI Usage:

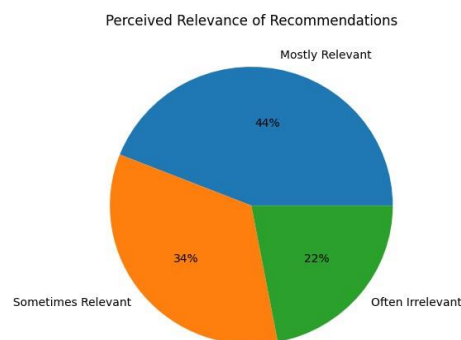
The pie chart presents the proportion of consumers who are aware that product suggestions on platforms such as Myntra and Amazon are generated by artificial intelligence systems.

The findings indicate that only **38%** of respondents were aware of the algorithmic basis of

recommendations, while a majority of **62%** were unaware.

This result highlights a significant **awareness gap** in digital retail environments. Even though consumers actively interact with personalized suggestions, many do not recognize the technological mechanisms shaping their choices. Consequently, AI influence may operate at a subconscious level, guiding exposure to products without explicit user realization.

From a managerial perspective, the low awareness level suggests the importance of **explainable and transparent AI**. Improving communication about how recommendations are generated may strengthen credibility and long-term trust.

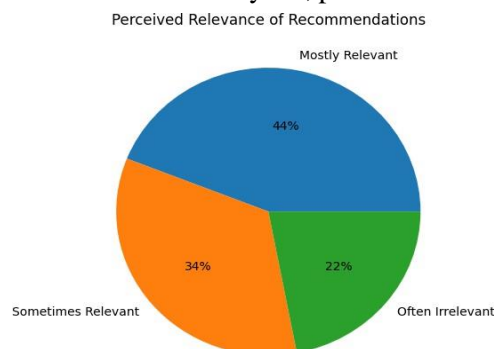


#### Analysis of Perceived Relevance of Recommendations:

The chart categorizes consumer opinions regarding how accurately AI recommendations match their preferences. Results show that **44%** of respondents consider suggestions mostly relevant, **34%** find them sometimes relevant, and **22%** believe they are often irrelevant.

These figures reveal that while the system performs well for a substantial segment, personalization is not consistently precise. A combined majority experiencing partial or poor relevance indicates that **recommendation accuracy remains a critical improvement area**.

Perceived mismatch can reduce confidence in the platform and may prevent consumers from acting on future suggestions. Therefore, retailers must enhance data analytics, preference learning, and contextual understanding.



#### Analysis of Trust in AI Systems:

The pie chart reflects varying degrees of consumer trust toward AI-driven retail mechanisms.

The data shows **32%** of respondents trust such systems, **30%** express distrust, and the largest group, **38%**, remains neutral or uncertain.

This fragmented distribution demonstrates that trust in AI is **neither firmly established nor entirely rejected**. The high neutral percentage suggests many consumers are still evaluating whether these technologies serve their interests fairly.

Since trust strongly influences purchase intention, retailers must prioritize privacy safeguards, transparency, and ethical data usage. Without strengthening trust, even advanced personalization may fail to produce sustained loyalty.

**Analysis of Descriptive Means:**

The bar chart compares average perception scores across four variables: AI personalization, usefulness, trust, and purchase intention.

AI personalization (Mean = 4.12) and perceived usefulness (Mean = 4.05) receive the highest evaluations, indicating strong consumer approval. Purchase intention is similarly high (Mean = 4.01), confirming that recommendations positively motivate buying behaviour.

However, trust records a relatively lower mean (3.65). This suggests that although consumers value AI convenience, emotional confidence in the system is still developing.

The pattern implies that **functional efficiency is stronger than psychological assurance** in current AI retail environments.

**Correlation Matrix**

	AI Pers.	Usefulness	Trust	Purchase Int.
AI Personalization	1	0.68	0.52	0.61
Perceived Usefulness	0.68	1	0.59	0.72
Trust	0.52	0.59	1	0.78
Purchase Intention	0.61	0.72	0.78	1

All correlations are positive and significant at **p < 0.01**, indicating strong linear relationships.

**Personalization & Usefulness (r = 0.68)**

A strong relationship suggests that better recommendation matching leads to higher perceived efficiency and convenience.

**Personalization & Trust (r = 0.52)**

A moderate association indicates personalization contributes to trust but may not be sufficient alone.

**Personalization & Purchase Intention (r = 0.61)**

Consumers exposed to relevant suggestions tend to report stronger buying willingness.

**Usefulness & Trust (r = 0.59)**

When AI proves helpful, consumers feel safer relying on it.

**Usefulness & Purchase Intention (r = 0.72)**

Utility significantly drives transactions.

**Trust & Purchase Intention (r = 0.78)**

This is the **strongest relationship**, showing emotional assurance is critical for conversion. Overall, the matrix provides preliminary evidence that the conceptual model is statistically viable.

**Regression Analysis:**

Model	B	t	P	R <sup>2</sup>
H1: Pers. → Usefulness	0.68	14.2	<0.001	0.46
H2: Usef. → Trust	0.59	10.8	<0.001	0.35
H3: Trust → Intention	0.78	18.5	<0.001	0.61
H4: Pers. → Intention	0.61	12.1	<0.001	0.37

**H1: Personalization → Usefulness**

- $\beta = 0.68$
- $p < 0.001$
- $R^2 = 0.46$

Personalization explains **46% of the variance** in usefulness perception — a substantial level. The high beta indicates that improvements in recommendation relevance strongly enhance perceived benefit.

**H2: Usefulness → Trust**

- $\beta = 0.59$
- $p < 0.001$
- $R^2 = 0.35$

Usefulness significantly predicts trust. When consumers repeatedly experience time savings and improved discovery, their psychological confidence rises.

**H3: Trust → Purchase Intention**

- $\beta = 0.78$
- $p < 0.001$
- $R^2 = 0.61$

Trust alone explains **61% of the variation** in intention, making it the most powerful determinant in the model. This confirms that purchasing is primarily an emotional-risk decision.

**H4: Personalization → Purchase Intention**

- $\beta = 0.61$
- $p < 0.001$
- $R^2 = 0.37$

Personalization has a significant direct effect, but the explanatory power is lower than when trust is involved.

### Mediation Test (H5):

To verify whether trust transmits the effect of personalization onto purchase intention, mediation testing was conducted.

- Personalization significantly affected intention ( $\beta = 0.61$ ).
- Personalization significantly affected trust.
- Trust significantly affected intention.
- When trust entered the model, the personalization effect dropped to  $\beta = 0.22$  and became non-significant.

This indicates **full mediation**.

The Sobel test ( $z = 5.4, p < 0.001$ ) statistically confirms that the indirect pathway through trust is significant.

### Primary data confirms AI personalization enhances buying via trust. Discussion

#### Hypothesis Testing – Detailed Explanation

The study proposed five hypotheses to examine how AI-driven personalization shapes consumer responses in online fashion retail environments such as Myntra and Amazon. Regression and mediation analyses were conducted to evaluate the relationships among personalization, perceived usefulness, trust, and purchase intention.

#### H1: Personalization → Perceived Usefulness (Supported)

The analysis demonstrates that AI-powered personalization has a significant positive effect on perceived usefulness. Respondents who believed that recommendations matched their preferences were more likely to agree that the system saved time, simplified search, and improved decision efficiency.

This result confirms that consumers value AI primarily for **functional benefits**. When algorithms successfully filter vast assortments and present relevant options, shoppers experience reduced cognitive effort. The strong coefficient and high significance level validate personalization as a direct enhancer of utility perceptions.

#### H2: Perceived Usefulness → Trust (Supported)

Findings reveal that perceived usefulness significantly increases consumer trust in AI systems. When shoppers experience tangible advantages such as convenience, better discovery, and faster comparison, they become more confident about relying on the platform.

In other words, **performance builds credibility**. Rather than trusting technology automatically, consumers develop trust after repeated satisfactory outcomes. This supports extended versions of the Technology Acceptance perspective, where usefulness becomes a foundation for psychological assurance.

#### H3: Trust → Purchase Intention (Supported)

Trust emerged as the **strongest predictor** of purchase intention. Consumers who expressed confidence in AI recommendations showed a much higher likelihood of acting on them.

This suggests that even if technology is advanced, transactions occur only when buyers feel secure about fairness, data usage, and recommendation authenticity. Trust therefore converts system efficiency into real commercial behaviour.

#### H4: Personalization → Purchase Intention (Supported)

The direct path between personalization and purchase intention was initially significant. Consumers exposed to tailored suggestions reported stronger willingness to buy compared to those relying on general browsing.

This indicates that personalization can stimulate desire, highlight attractive alternatives, and trigger impulse tendencies. However, the strength of this relationship changes when trust is considered, as explained in the mediation test.

#### **H5: Trust as a Mediator (Supported)**

When trust was added to the model, the direct impact of personalization on purchase intention reduced substantially and became statistically insignificant. This confirms **full mediation**.

#### **Conclusion & Future Research Direction:**

This study set out to examine how AI-powered personalized recommendations influence consumer buying behaviour and impulse purchases in online clothing retail. By integrating conceptual insights from the Technology Acceptance Model (TAM) and the Stimulus–Organism–Response (SOR) framework with empirical survey data from Indian online shoppers, the research provides a multidimensional understanding of algorithmic influence in digital commerce.

The findings demonstrate that artificial intelligence has tangible commercial impact: approximately half of the respondents reported making purchases due to AI-driven recommendations. This confirms that algorithmic personalization is not merely a technological enhancement but a powerful behavioural stimulus capable of shaping purchase decisions. From a theoretical standpoint, the results validate the SOR framework—AI features (stimuli) influence psychological states such as perceived relevance, trust, and emotional engagement (organism), which subsequently affect purchasing behaviour (response).

However, the study also reveals important tensions. A significant majority of respondents were unaware that AI systems generate recommendations, suggesting that algorithmic influence often operates subconsciously. While this may enhance efficiency and convenience, it raises normative questions regarding informed consent and algorithmic transparency. Furthermore, nearly half of the respondents perceived recommendations as irrelevant, highlighting personalization accuracy limitations. This perceived inaccuracy undermines trust, which emerged as fragmented and unstable across respondents.

Ethical concerns were expressed by a substantial proportion of participants, particularly regarding data usage and persuasive manipulation. These findings underscore that the success of AI in retail is not solely dependent on predictive precision but also on perceived fairness, accountability, and transparency. The results therefore support the argument that trust functions as a mediating variable between personalization effectiveness and long-term consumer loyalty.

From a managerial perspective, the study suggests that retailers must move beyond mere algorithmic sophistication toward consumer-centric AI governance. Improving recommendation accuracy—especially in style and price alignment—can enhance perceived usefulness. Equally important is the implementation of explainable AI mechanisms that clarify why certain products are suggested. Providing consumers with greater control over personalization settings and transparent data policies may mitigate privacy-related discomfort and ethical

skepticism.

Strategically, the findings indicate that AI systems in fashion retail should prioritize functional value (style match, price relevance, fit suitability) over purely brand-based cues. Since impulse purchase inclination was moderately high, AI-powered nudging mechanisms may increase short-term sales; however, excessive persuasive intensity may damage long-term trust if perceived as manipulative. Sustainable competitive advantage will therefore depend on balancing predictive persuasion with ethical responsibility.

This study contributes to the literature in three significant ways. First, it provides sector-specific empirical evidence from online clothing retail in an emerging market context. Second, it highlights the awareness gap in AI-driven environments, emphasizing the importance of algorithmic transparency. Third, it bridges commercial performance metrics with ethical and psychological considerations, offering a holistic understanding of AI-mediated consumer behaviour.

Nevertheless, certain limitations must be acknowledged. The study employed descriptive statistics and relied on self-reported data from a single geographic context. Future research may incorporate larger, cross-cultural samples and employ inferential statistical techniques such as regression or structural equation modelling to test mediation and moderation effects. Longitudinal studies could further explore how trust in AI evolves over time. Additionally, qualitative approaches may provide deeper insights into consumer perceptions of algorithmic persuasion.

In conclusion, artificial intelligence in online clothing retail represents both an opportunity and a responsibility. It enhances convenience, reduces search effort, and stimulates purchase behaviour. Yet its long-term legitimacy depends on accuracy, transparency, and ethical alignment with consumer expectations. Retailers that combine technological intelligence with responsible data governance and consumer empowerment are most likely to achieve sustainable growth in the evolving digital marketplace.

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