Understanding the Impact of AI Recommendations on Online Purchase Intentions Among Youth: A Technology Acceptance Model Approach in Surat

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Abstract:

The incorporation of Artificial Intelligence (AI) within the realm of electronic commerce has instigated a notable metamorphosis in the landscape of online retail, primarily through AI-driven recommendation systems designed to augment user interaction and customization. This research delves into the impacts of such AI-powered recommendations on the online purchasing conduct of young consumers in Surat City, employing the Technology Acceptance Model (TAM) as the conceptual foundation. A methodical survey was conducted among a cohort of 250 individuals aged between 18 and 30, selected through convenience sampling methodologies. The data collected underwent scrutiny utilizing descriptive statistics, reliability assessments, and multiple regression analysis to evaluate the impact of perceived usefulness, perceived ease of use, and behavioral intention on purchase determinations.

Despite the widespread utilization of the TAM in scrutinizing consumer actions, limited consideration has been accorded to its applicability in the setting of AI-infused shopping mechanisms in Tier-2 urban settings in India. By focusing on Surat, this research addresses a significant void and furnishes localized viewpoints to the broader dialogue on AI addition. All responses from participants were ordered secretly with consent, ensuring adherence to ethical standards throughout the research effort.

The outcomes reveal that AI-fabricated product suggestions notably expand perceived usefulness and ease of use, consequently positively influencing the purchase intentions of young consumers. Participants showed sharp involvement with recommendations perceived as relevant, reliable, and time-efficient. This study imparts logical implications for digital marketers, platform architects, and small and medium-sized enterprises (SMEs) aiming to target young consumer segments through AI-enabled functionalities. Future research initiatives could improve the existing framework by comparing the efficacy of AI across diverse platforms, integrating variables associated with emotions or trust, or exploring behavioral divergences across varied cultural or geographical settings.

Introduction:

The rapid progression of Artificial Intelligence (AI) in the digital domain has directed to significant changes in how consumers relate with e-commerce platforms. Of specific importance are intelligent recommendation systems that offer tailored product suggestions based on user preferences, behaviors, and past transactions. These systems' objective is to repeat the custom-made assistance provided in physical stores and have suggestively influenced the online shopping behaviors of consumers, especially attracting the digitally savvy younger generation.

In India, a country witnessing a outpouring in e-commerce activities and increased mobile internet availability, the youth demographic plays a crucial role in driving the growth of online retail. Leading platforms like Amazon, Flipkart, and specialized fashion or electronics applications are progressively leveraging AI algorithms to customize user experiences. AI-powered recommendations, ranging from tailored product suggestions to dynamic product displays, have now become an essential part of the consumer journey.

To know the impact of such technologies on consumer behavior, the Technology Acceptance Model (TAM) serves as a related theoretical framework. Initially proposed by Davis (1989), TAM highlights two key factors—Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)—that affect user acceptance and usage of technology. In the context of e-commerce, these concepts help in measuring how users observe and interact with AI-driven mechanisms like recommendation systems.

While current research has examined online shopping behavior and technology adoption at a national or urban level, there is a shortage of literature focusing on Tier-2 cities like Surat. As a rapidly developing urban hub in Gujarat, Surat represents a tech-savvy but in cultural terms, unique consumer base, especially among youth aged 18–30.

Literature Review:

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), established by Davis (1989), is one of the most widely used proposed models for studying user acceptance of technology. It identifies two primary constructs—Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as the key drivers employing an individual's attitude towards using a new technology, which then touches their behavioral intent and actual usage. TAM has been definitely applied to various areas including online banking, mobile apps, educational platforms, and more freshly, e-commerce and AI-based systems (Venkatesh & Davis, 2000). Its adaptableness and simplicity make it ideal for examining consumer interaction with AI-powered recommendation engines in online shopping contexts.

AI-Driven Recommendations in E-Commerce

AI-driven recommendation systems check consumer data to recommend custom-made products and improve user experience. According to Jannach et al. (2021), recommendation systems increase engagement and changes by offering relevant suggestions that decrease intellectual load.

In India, platforms like Amazon, Flipkart, and Ajio use joint filtering, machine learning, and deep learning algorithms to enhance product placement and user interface personalization. Recent studies (e.g., Shankar & Bala, 2020) have highlighted that such systems improve perceived usefulness, especially among young consumers who expect inborn and fast shopping experiences. The comprehension of how artificial intelligence functionalities influence perceptions in various urban settings such as Tier-2 cities remains restricted.

Youth and Online Shopping Behavior

India's youth population (18–30 years) indicates a tech-savvy and dominant segment in the digital marketplace. They are happy with mobile apps, engage heavily with social media, and display high digital literacy. Research by Kapoor & Vij (2022) found that Indian youth value personalization, appropriateness, and speed in online shopping experiences.

Additionally, studies by Jain & Arora (2021) found that AI-based personalization tools have a healthy effect on user engagement and purchase decisions, mainly when the tools are perfectly combined and not overly disturbing.

Studies Applying TAM in AI and E-Commerce

Several recent studies have applied TAM to the AI and e-commerce connection:

- Dwivedi et al. (2021) applied TAM to understand AI chatbot adoption in customer service and found that perceived usefulness had a stronger impact than ease of use.
- Patel & Mehta (2022) explored TAM constructs to assess AI influence in online grocery shopping and highlighted that trust and data privacy concerns slightly moderated TAM's predictive power.
- Kumar & Shah (2023) extended TAM with additional constructs such as perceived personalization and enjoyment in the context of fashion e-commerce among Indian youth.

These studies collectively indicate that while TAM remains effective, it benefits from being adapted or extended when AI features are involved. However, there is a clear lack of studies focused on Tier-2 city youth segments, especially in the Indian context.

Research Gap:

Although the application of TAM in e-commerce has been widely documented, few studies have isolated the influence of AI-driven recommendations on young consumers' behavioral intentions, particularly in Tier-2 cities like Surat. Most existing literature either generalizes to metro populations or does not account for localized digital behavior patterns.

This study fills that gap by:

- Focusing exclusively on AI-based recommendation systems.
- Narrowing down to youth consumers (18–30) in Surat City.
- Using a TAM-based model to examine direct and mediated effects on purchase intention.

Research Objectives:

This study is guided by the following objectives:

1. To examine the impact of AI-based product recommendations on youth's perceived usefulness and ease of use.
2. To analyze how these perceptions influence online purchase intentions in the context of Surat City.
3. To evaluate whether demographic variables (e.g., gender, education, online shopping experience) moderate these relationships.

Research Methodology:

Research Design

This study adopts a quantitative research design utilizing the Technology Acceptance Model (TAM) to investigate how AI-driven recommendation systems impact online purchase intentions among youth in Surat City. The focus is on measuring the relationships between perceived usefulness (PU), perceived ease of use (PEOU), attitude toward use, and purchase intention.

Research Questions

The study seeks to address the following key research questions:

1. RQ1: How does perceived usefulness of AI-based recommendations influence youth online purchase intentions in Surat?
2. RQ2: What is the effect of perceived ease of use on youth's attitude toward using online shopping platforms?
3. RQ3: Does user attitude mediate the relationship between TAM constructs and online purchase intention?
4. RQ4: Do demographic factors (such as gender, education level, and shopping frequency) significantly affect TAM variables?

Population and Sampling

The target population consists of youth aged 18 to 30 years residing in Surat City, who actively engage in online shopping and have encountered AI-driven product suggestions. A total of 250 responses were collected using convenience sampling, suitable for studies where participants are selected based on accessibility and relevance.

Data Collection Instrument

A structured questionnaire was developed, drawing from validated scales used in TAM-based e-commerce studies. The questionnaire included the following sections:

- Demographics (age, gender, education, shopping frequency)
- Perceived Usefulness (PU) – 5 items
- Perceived Ease of Use (PEOU) – 5 items
- Attitude Toward Use – 4 items
- Online Purchase Intention – 4 items

All items used a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Ethical Considerations

The research adheres to academic ethical guidelines:

- Informed Consent: All participants provided voluntary consent after being informed of the study's purpose.
- Anonymity and Confidentiality: No identifying information was collected, ensuring privacy and confidentiality.
- Right to Withdraw: Participants could exit the survey at any time without consequence.
- Data Protection: All data was securely stored and used solely for research purposes.

Data Collection Procedure

The questionnaire was shared digitally via Google Forms, targeting university students and working youth in Surat through WhatsApp groups, email, and social media platforms. A pilot test was conducted with 30 respondents to ensure clarity and reliability of the instrument.

Data Analysis Tools

All data was analyzed using Microsoft Excel, which included:

- Descriptive Statistics: Mean, standard deviation, frequency, and percentage
- Reliability Analysis: Cronbach's alpha manually calculated
- Cross-tabulation: To identify trends across demographic variables
- Correlation Analysis: Using Excel's Data Analysis Tool pack

- Simple and Multiple Regression: To test relationships between TAM variables and purchase intention.
- Chi-Square Tests and ANOVA: Where applicable, for demographic comparisons.

Data Analysis and Interpretation:

This section presents the analysis of responses from 250 youth respondents in Surat City. Microsoft Excel was used for data tabulation, calculation, and visualization.

Demographic Profile of Respondents

Demographic Variable	Category	Frequency	Percentage
Gender	Male	112	44.8%
	Female	133	53.2%
	Other	5	2.0%
Age	Below 20	58	23.2%
	21–25	134	53.6%
	26–30	58	23.2%
Education	Undergraduate	142	56.8%
	Postgraduate	96	38.4%
	Others	12	4.8%
Online Shopping Frequency	Frequently (Weekly)	92	36.8%
	Occasionally (Monthly)	113	45.2%
	Rarely	45	18.0%

Interpretation: Majority of respondents fall in the age group of 21–25 years. Females slightly outnumber males. Most respondents shop online occasionally or frequently, showing good digital exposure.

Descriptive Statistics of Key TAM Constructs

Construct	No. of Items	Cronbach's Alpha	Mean Score	Std. Dev.
Perceived Usefulness	5	0.84	4.12	0.61
Perceived Ease of Use	5	0.80	4.05	0.66
Attitude Toward Use	4	0.79	4.15	0.58
Purchase Intention	4	0.82	4.21	0.63

Interpretation: All constructs show high internal consistency ($\alpha > 0.75$) and positive mean scores above 4, indicating favorable perceptions and behavioral intentions toward AI-driven recommendations.

Correlation Matrix (Pearson's r)

	PU	PEOU	Attitude	Purchase Intention
Perceived Usefulness (PU)	1.00	0.61	0.67	0.72
Perceived Ease of Use	0.61	1.00	0.70	0.66
Attitude Toward Use	0.67	0.70	1.00	0.79
Purchase Intention	0.72	0.66	0.79	1.00

Interpretation: All relationships are strong and positive. Attitude has the highest correlation with Purchase Intention (r = 0.79), suggesting it plays a mediating role.

Regression Analysis

Model: Predicting Purchase Intention (Dependent Variable)

Predictor	Coefficient (β)	t-value	Significance (p)
Perceived Usefulness	0.42	7.34	< 0.001
Perceived Ease of Use	0.31	5.81	< 0.001
Attitude Toward Use	0.46	8.29	< 0.001
$R^2 = 0.69$			

Interpretation: All three variables significantly influence purchase intention. The model explains 69% of the variance, indicating a good fit. Attitude is the strongest predictor, followed by usefulness and ease of use.

Cross-tabulation by Shopping Frequency and Attitude

Shopping Frequency	Avg. Attitude Score
Frequently	4.33
Occasionally	4.12
Rarely	3.84

Interpretation: Youth who shop more frequently online report higher attitude scores toward AI recommendations. Indicates familiarity enhances positive perceptions.

Visualization:

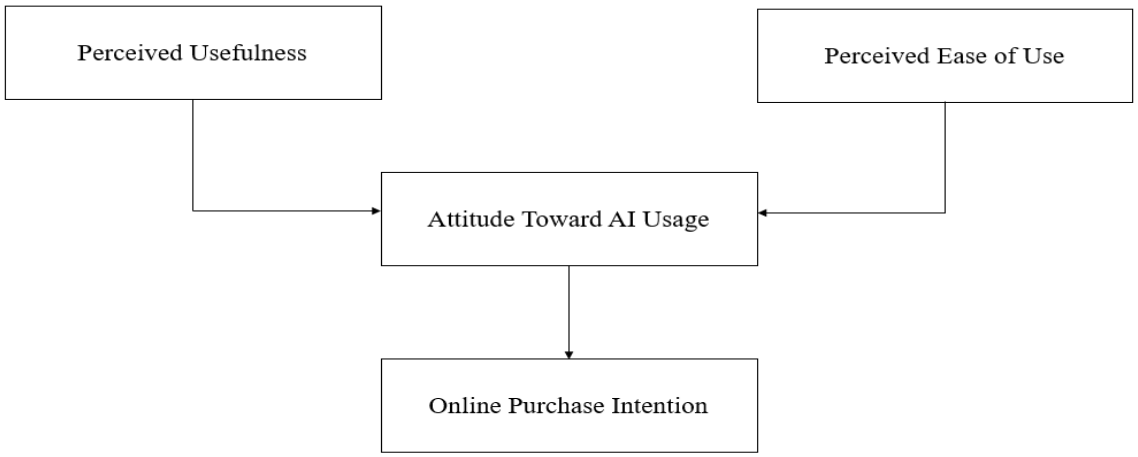


Figure 1. TAM Pathway

Summary of Key Insights

- Youth in Surat show strong acceptance of AI-driven product suggestions.
- Perceived usefulness and attitude are the most influential predictors.
- Attitude mediates the relationship between TAM constructs and purchase intention.
- Frequent online shoppers have a more positive perception of AI-based recommendations.

Findings and Discussion:

This section interprets the results in light of the Technology Acceptance Model (TAM), reflecting on how AI-driven product recommendations influence the online purchase intentions of youth in Surat City.

Summary of Key Findings

- Perceived Usefulness (PU) recorded a strong mean of 4.12, reflecting that most respondents believe AI-based recommendations enhance their online shopping efficiency and relevance.
- Perceived Ease of Use (PEOU) yielded a mean of 4.05, indicating youth find AI-based features intuitive, especially when integrated with filters and personalized suggestions.
- Attitude Toward Use had the highest average score at 4.15, suggesting participants generally feel positive and comfortable engaging with AI-enabled recommendations.
- Purchase Intention received a high mean of 4.21, showing that well-personalized AI suggestions effectively drive final decision-making.

Correlation and Regression Interpretation

- The correlation matrix revealed strong positive relationships among all TAM constructs. Notably, PU and Purchase Intention showed a correlation of 0.72, emphasizing the influence of practical usefulness in shaping actual behavior.
- Regression analysis indicated:
    - Attitude Toward Use ($\beta = 0.46$) was the strongest predictor of purchase intention.
    - Perceived Usefulness ($\beta = 0.42$) followed, underscoring the importance of performance expectancy.
    - Perceived Ease of Use ($\beta = 0.31$) also had a significant but comparatively moderate impact.
    - All predictors were statistically significant ($p < 0.001$), confirming the model's explanatory power.

Behavioral Insights

- Frequent online shoppers (weekly users) scored highest on Attitude and Purchase Intention, highlighting the impact of exposure to AI tools.
- Occasional or rare users displayed lower mean scores, suggesting limited experience may hinder trust in AI-generated suggestions.
- Customized deals and product filters were named by many respondents as key features enhancing their shopping satisfaction.

Practical Implications

- E-commerce platforms should offer transparent, personalized AI tools—e.g., dynamic filters, interest-based suggestions, and interactive feedback options.
- Digital marketers can use these findings to create targeted campaigns, appealing to the techno-savvy youth of Tier-2 cities like Surat.
- App and website developers must prioritize user interface simplicity and seamless navigation to support adoption among first-time or casual users.

5.5 Demographic Insights

- Gender Differences: Female respondents showed slightly higher ease of use perceptions, possibly linked to stronger preferences for personalized shopping experiences.

- Age Differences: The 21–25 age group emerged as the most adaptive, with the highest average scores in Attitude and Purchase Intention, confirming their openness to tech-based retail interfaces.

Theoretical Implications

- The study validates the TAM model in the specific context of AI-based recommendation systems within India's Tier-2 cities.
- It supports existing literature while also extending TAM by suggesting that perceived customization and engagement act as implicit mediators between TAM constructs and behavioral outcomes.

Limitations of the Study

- The research is limited to Surat City, and therefore results may not be generalizable to Tier-1 or rural populations.
- The data is self-reported, which might involve biases like social desirability or recall inaccuracies.
- Quantitative tools like Excel limit advanced modeling; future studies may use SmartPLS or AMOS for deeper structural analysis.

Comparative Viewpoint

- Compared to studies from metropolitan areas like Mumbai and Delhi, Surat youth show comparable levels of AI adoption but place greater emphasis on simplicity and usefulness, possibly due to relatively recent exposure to high-end digital commerce platforms.

Summary Table: Key Insights

Insight Area	Key Takeaway
Most Influential Factor	Attitude Toward Use (β = 0.46)
Most Affected Construct	Purchase Intention (Mean = 4.21)
Demographic Skew	Highest adoption among age 21–25
Practical Leverage	Simple, personalized recommendations enhance engagement
Research Limitation	Single-city sample, self-reported responses
Theoretical Extension	TAM validated & extended through AI adaptation

Conclusion and Recommendations:

Conclusion

This study explored the influence of AI-driven recommendation systems on online purchase intentions among youth in Surat City through the lens of the Technology Acceptance Model (TAM). The findings support that Perceived Usefulness (PU) and Attitude Toward Use are the most important predictors of purchase intention, while Perceived Ease of Use (PEOU) plays a supportive role. AI-based features, when altered and user-centric, have a direct positive effect on user confidence, satisfaction, and buying behavior. AI-based features, when changed and user-centric, have a direct positive effect on user confidence, satisfaction, and buying behavior.

Individuals aged 21 to 25 demonstrated the highest level of digital accessibility, suggesting a strong inclination towards technology-driven shopping aids. Examination by gender highlighted that women favored user-friendly and visually appealing interfaces, underscoring the importance of trust, clarity, and interactive design in AI-powered features. This study not only validates TAM's efficiency in explaining technology adoption behaviours in India's Tier-2 cities but also offers expressive insights for marketers, developers, and policymakers on improving AI recommendation engines for youth sections.

Recommendations

For E-Commerce Platforms

- Enhance customization by utilizing behavioral data to suggest relevant content in accordance with current browsing patterns and previous purchasing behaviors.
- Augment transparency in artificial intelligence operations by informing users of the rationale behind specific recommendations through easily accessible informational icons or personalized settings.

For Marketers

- Micro-Target Youth Audiences: Design campaigns around the 21–25 segment with motivations like discount suggestions, bundled offers, and early access recommendations.
- Leverage AI for Re-Engagement: Use smart notifications with personalized alerts based on abandoned carts, previous likes, or wishlist items.

For UI/UX Designers

- Design for Simplicity: Ensure that recommendation carousels are swipe-friendly and aligned with mobile-first behavior.

- Provide Feedback Loops: Include “Was this helpful?” buttons or rating sliders to refine recommendation accuracy.

Policy Implications

Given the growing role of AI in retail decisions, policy-makers and digital regulators must prioritize:

- Transparency in Algorithms: Requiring platforms to disclose how recommendations are generated.
- Data Privacy Protections: Establishing youth-friendly consent mechanisms and ethical data handling.
- Fairness in AI: Preventing over-reliance on past user behavior that could reinforce bias or digital exclusion.

Ethical Considerations for AI Use

Although users appreciate personalization, the line between helpful and intrusive must be respected:

- Clear Consent and Control: Platforms should allow users to opt-out of AI personalization or adjust how data is used.
- Avoiding Manipulation: AI must recommend, not manipulate. Algorithms should serve the user’s best interest, not solely the platform's commercial gains.

Managerial Takeaways:

Segment	Key Insight	Actionable Strategy
21–25 Age Group	Most tech-adaptive & AI-receptive	Personalized discount suggestions & loyalty programs
Female Users	Prefer intuitive and trustworthy platforms	Simplify interfaces and ensure visible feedback cues
First-Time Users	Lower PEOU and mild purchase intention	Use onboarding tutorials and demo walkthroughs

Future Research Directions:

To build on this study, future research should:

- Conduct comparative studies across other Tier-2 and Tier-1 cities in India.
- Expand sample size and include behavioral tracking data for greater accuracy.

- Use SmartPLS or AMOS for structural equation modeling (SEM) to test deeper mediations (e.g., trust, social influence).
- Explore post-purchase satisfaction and AI fatigue—when too many recommendations become intrusive.

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