

When AI Knows What You Want Before You Search: Impact of Predictive Marketing on Purchase Decisions Among College Students

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Abstract—Artificial Intelligence (AI) is transforming digital marketing by enabling businesses to move beyond responding to customer behaviour towards predicting customer needs and preferences. College students, as active users of digital platforms, are increasingly exposed to AI-driven recommendations, personalised advertisements and content based on their online activities. In several instances, products or services appear on digital platforms even before consumers actively search for them. This emerging pattern raises an important question: whether AI merely predicts consumer preferences or also influences the choices consumers eventually make. The present study aims to examine the influence of AI-driven predictive marketing on the purchase decisions of college students. The study focuses on key factors including personalised recommendations, predictive advertising, perceived relevance, consumer trust, privacy concerns and purchase intention.

A descriptive and analytical research design will be adopted for the study. Primary data will be collected from college students through a structured questionnaire, supported by relevant secondary literature on Artificial Intelligence, digital marketing and consumer behaviour. The collected data will be analysed using appropriate statistical techniques to identify patterns and examine the relationship between exposure to AI driven marketing and purchase intention. The study seeks to understand how young consumers perceive marketing practices that appear to anticipate their needs and preferences. It will further examine whether predictive marketing is perceived as convenient and relevant or as intrusive and overly influential. The research is expected to provide insights into the changing nature of consumer decision-making in an AI driven digital environment and offer practical implications for marketers seeking to use predictive technologies while maintaining consumer trust, transparency and responsible marketing practices.

Index Terms—Artificial Intelligence; Predictive Marketing; Digital Marketing; Consumer Behaviour; College Students; Purchase Intention; Personalization; Consumer Trust.

I. INTRODUCTION

1.1. Background

The rapid growth of digital technologies has significantly changed the way consumers discover, evaluate, and purchase products and services. With the increasing use of social media, e-commerce platforms, search engines, and other digital channels, consumers continuously generate behavioural information through their searches, clicks, views, purchases, and online interactions. This growing volume of consumer data has created new opportunities for marketers to understand individual preferences and deliver personalised experiences.

Artificial Intelligence (AI) has become an important component of this transformation. Unlike traditional marketing approaches that primarily rely on broad consumer segments, AI-enabled marketing systems can analyse large volumes of behavioural data, identify patterns, and generate personalised advertisements, product recommendations, and predictive marketing content. An important development within this field is predictive AI marketing, in which algorithms use available consumer information to anticipate preferences, interests, or likely future actions and provide personalised recommendations.

In such situations, consumers may encounter a product recommendation that appears relevant even before they have explicitly searched for the product. This represents a shift from marketing that responds to

expressed consumer needs towards marketing that attempts to anticipate emerging or unexpressed preferences. However, exposure to such recommendations does not necessarily result in purchase. Consumers may respond differently depending on the perceived relevance, accuracy, usefulness, and trustworthiness of the recommendations. College students provide a relevant context for examining these developments because they frequently interact with social-media platforms, search engines, e-commerce websites, and other digital services where personalised recommendations are commonly encountered. Their experiences also provide an opportunity to examine how perceived usefulness, relevance, accuracy, trust, and concerns regarding personal-data use may shape responses to AI-driven marketing.

1.2. Need for the Study / Research Problem -

The increasing ability of AI systems to anticipate consumer interests raises important questions about how such recommendations are experienced and whether they influence purchase-related decisions. A recommendation that appears before an individual has actively searched for a product may be perceived as convenient and relevant, but it may also raise concerns regarding accuracy, trust, privacy, and the extent of AI's influence on consumer choice. Understanding these responses is therefore important for evaluating predictive AI marketing from a consumer perspective rather than solely from the standpoint of technological performance.

1.3. Research Gap

Although existing research has examined AI-based personalisation, recommendation systems, predictive analytics, consumer trust, and purchase-related outcomes, comparatively limited empirical attention has been given to the consumer experience of recommendations that appear to anticipate an interest before an active search. In particular, the combined relationship between this anticipatory experience, perceived relevance and accuracy, usefulness, trust, and purchase decisions remain insufficiently examined among college students. The present study therefore focuses on this under-examined consumer perspective by investigating how predictive AI marketing experiences are associated with purchase decisions among college students.

1.4. Research Objectives -

The study aims:

1. To examine the exposure of college students to predictive AI-generated recommendations, particularly recommendations that appear before an active product search.
2. To assess the perceived relevance and accuracy of predictive AI-generated recommendations among college students.
3. To evaluate the perceived usefulness of predictive AI-generated recommendations in the purchase decision-making process.
4. To examine the level of trust college students, place in AI-generated recommendations.
5. To examine the relationship between predictive AI recommendation experiences and purchase decisions among college students.
6. To understand college students' concerns regarding privacy and the use of personal data for AI-based personalised marketing.
7. To assess the overall perception of predictive AI marketing among college students and its role in their digital purchase decision-making.

1.5. Research Hypotheses -

Based on the research objectives and the synthesis of the existing literature, the following hypotheses are formulated to examine the relationship between predictive AI marketing and purchase decisions among college students:

H1: There is a significant relationship between exposure to predictive AI-generated recommendations and consumers' purchase decisions.

H2: There is a significant relationship between the perceived relevance of predictive AI-generated recommendations and consumers' purchase decisions.

H3: There is a significant relationship between the perceived accuracy of predictive AI-generated recommendations and consumers' purchase decisions.

H4: There is a significant relationship between the perceived usefulness of predictive AI-generated recommendations and consumers' purchase decisions.

H5: There is a significant relationship between consumers' trust in predictive AI-generated recommendations and their purchase decisions.

II. LITERATURE REVIEW

1. Jain and Kumar (2024), in their research paper “Artificial Intelligence in Marketing: Two Decades Review,” examined the development and application of Artificial Intelligence in marketing through a review of existing research. The study highlights the growing use of AI in prediction analysis, customer relationship management, strategic marketing, advertising, and consumer engagement. It identifies AI as an increasingly important component of data-driven marketing and points to opportunities for further research into its evolving role.

2. Jain, Wadhvani, and Eastman (2024), in their research paper “Artificial Intelligence Consumer Behavior: A Hybrid Review and Research Agenda,” examined the growing body of research on AI and consumer behaviour. Based on an analysis of 107 research articles, the study identified consumer acceptance and trust, engagement, attitudes, decision-making, and adoption of AI-based applications as major areas of research. The review highlights the increasing relevance of AI across different stages of consumer behaviour.

3. Chang and Park (2024), in their research paper “A Comparative Study on the Effect of ChatGPT Recommendation and AI Recommender Systems on the Formation of a Consideration Set,” examined how AI-generated recommendations influence consumers’ product choices during the purchase journey. Based on responses from 443 participants, the study found that both ChatGPT recommendations and conventional AI recommender systems can influence the products consumers consider. Trust in the recommender and recommended products also contributed to this influence.

4. Yun and Chun (2024), in their research paper “The Impact of Personalized Recommendation on Purchase Intention under the Background of Big Data,” examined how personalised recommendation systems influence purchase intention in online environments. The study considered characteristics including precision, timeliness, interactivity, recommendation strength, information layout, and recommendation method, along with perceived trust and consumer experience.

The findings highlight the importance of personalised recommendations in shaping consumer responses and purchase intentions.

5. Jiang and Kim (2024), in their research paper “Influence of AI Recommender System on Consumers’ Purchase Intention in CBEC Platforms,” examined the influence of AI-based recommender systems on consumer trust and purchase intention in cross-border e-commerce. The study focused on recommendation characteristics such as performance, accuracy, diversity, and the system’s ability to learn consumer preferences. The findings indicate that these characteristics can influence consumer trust and purchase intention.

6. Zhu, Zhu, Ou, and Yin (2023), in their research paper “To Be Precise (Imprecise) in Utilitarian (Hedonic) Contexts: Examining the Influence of Numerical Precision on Consumer Reactions to Artificial Intelligence-Based Recommendations,” examined how the precision of AI-generated recommendations affects consumer responses in different consumption contexts. Across four studies, the researchers found that consumers responded more favourably to precise AI recommendations in utilitarian contexts, whereas less precise recommendations were more suitable in hedonic contexts. The findings suggest that the effectiveness of AI recommendations depends partly on the consumption situation.

7. Abbas, Shah, and Gardezi (2026), in their research paper “AI-Driven Personalization in Digital Marketing and Consumer Purchase Intention: The Moderating Role of Consumer Trust,” examined the relationship between AI-driven personalisation and consumer purchase intention among university students in Peshawar, Pakistan. The study found that AI-driven personalisation had a statistically significant positive effect on purchase intention. Consumer trust further strengthened this relationship, highlighting its importance in personalised AI-based marketing.

8. Khan, Attaullah, and Hassan (2025), in their research paper “The Impact of AI-Driven Personalization on Online Purchase Intentions: The Mediating Roles of Consumer Trust and Perceived Relevance,” examined the relationship between AI-

driven personalisation and online purchase intentions among 429 university students. The findings showed that AI-driven personalisation positively influenced purchase intentions both directly and through consumer trust and perceived relevance. The study therefore highlights relevance and trust as important factors in personalised digital marketing.

9. Jith et al. (2025), in their research paper “AI-Driven Personalization in E-Commerce: Impact on Consumer Purchase Intention and Trust,” examined the influence of AI-driven personalisation on purchase intention and trust in e-commerce. Using 847 survey participants and 32 qualitative interviews, the study found that personalisation positively influences purchase intention, while transparency in data usage and perceived consumer control contribute to trust. Privacy concerns may reduce trust when personalised recommendations are perceived as intrusive.

10. Dar, Yunus, Ali, and Hussain (2025), in their research paper “From Clicks to Conversions: How AI-Driven Personalization Shapes Consumer Trust and Purchase Intent in Digital Marketing,” examined how AI-driven personalisation influences consumer trust and purchase intention. Based on data from 500 individuals who had experienced AI-based personalised content, the study found that perceived relevance was strongly associated with purchase intention, while trust also played an important role in buying behaviour. The findings highlight the importance of relevance, transparency, and responsible data use.

11. Hermann and Puntoni (2024), in their research paper “Artificial Intelligence and Consumer Behavior: From Predictive to Generative AI,” examined the implications of AI for consumer behaviour as the technology develops from predictive to generative applications. The study explains how predictive AI uses consumer data to generate algorithmic predictions that are increasingly incorporated into recommendation systems and online advertising. It provides an important conceptual foundation for understanding how AI-based predictions may influence consumer experiences and decision-making.

12. Jize and Jamaludin (2025), in their research paper “ChatGPT Made Me Buy It: The Role of AI

Recommendation Tools in Shaping Generation Z Consumers’ Trust and Purchase Intentions,” examined how AI-based recommendation tools influence trust and purchase intention among Generation Z consumers. The study collected data from 200 Generation Z consumers in Malaysia, most of whom were students. The findings indicate that perceived personalisation is positively associated with trust in AI recommendation tools, while trust plays an important role in purchase intention.

13. Hu, Liu, Li, Yin, and Liu (2025), in their research paper “Exploring the Mechanism of AI-Powered Personalized Product Recommendation on Generation Z Users’ Spontaneous Buying Intention on Short-Form Video Platforms: A Perceived Evaluation Perspective,” examined how AI-powered personalised product recommendations influence spontaneous buying intention among Generation Z users. Based on 754 respondents in mainland China, the study found that personalised recommendations positively influenced spontaneous buying intention, both directly and through perceived usefulness and trust. The study also highlights the importance of accuracy, transparency, and interpretability.

14. Saura, Ratten, and Jeremic (2026), in their research paper “Digital Cognition in Predictive Marketing Personalization: A Conceptual Framework,” developed a conceptual framework explaining how predictive personalisation operates through AI, algorithms, and digital platforms. The study explains how behavioural data can be processed to personalise digital content and experiences. It suggests that predictive personalisation may influence consumer attention, memory, and decision-making while subsequent behaviour generates further data for continued personalisation.

15. Roshith et al. (2026), in their research paper “Privacy Perceptions of Urban and Educated Indian Gen Z Consumers in Gen AI-Driven Hyper-Personalized Advertising,” examined privacy perceptions among urban and educated Indian Generation Z consumers.

Based on semi-structured interviews with 20 participants, the study identified concerns relating to privacy invasion, consent, data ownership, and control over personal information. The findings emphasise the

importance of transparency, meaningful consent, and consumer control in AI-driven personalised advertising.

16. Srivastava, Ekka, and Kumar (2025), in their research paper “A Study of the Effects of Predictive Personalization and Generative-AI-Driven Campaigns on Consumer Engagement and Brand Trust within AI-Enhanced Marketing,” examined predictive personalisation and generative AI-driven marketing in relation to consumer engagement and brand trust. The study suggests that predictive personalisation can improve the accuracy of AI-based marketing, although excessive reliance on technology may reduce emotional appeal. It highlights the need to balance AI-based prediction with human creativity and emotional connection.

17. Sasikala, Shobhana, and Kamaladevi (2026), in their research paper “Impact of AI-Driven Personalized Product Recommendation Systems on Online Purchase Intention: Indian E-Commerce Shoppers’ Perceived Relevance and Trust,” examined AI-driven personalised product recommendations among Indian online shoppers. Based on data from 160 shoppers, the study found that recommendation customisation and transparency strengthened consumer trust, while recommendation accuracy contributed to perceived relevance. Both perceived relevance and trust positively influenced purchase intention.

18. “Crafting the Customer E-Journey: The Role of Digital Anticipation Nudges in a Seamless Delivery Experience and Actual Purchasing Behavior Online” (2026) examined how digital anticipation nudges influence consumers’ movement through the online customer journey. Across five studies, including field and controlled experiments, the research found that anticipatory digital cues can facilitate movement between stages of the customer journey and influence actual purchasing behaviour. This is particularly relevant to predictive marketing because it considers the anticipation of consumers’ future actions rather than only their current behaviour.

19. Kotravel Bharathi and Elakkiyan (2026), in their research paper “Leveraging Artificial Intelligence for Predictive Modelling of Consumer Buying Intentions

on E-Commerce Platforms,” examined the use of AI and machine-learning techniques to predict consumer buying intentions using digital behavioural information and consumer reviews. The study compared several machine-learning models and found stronger performance from ensemble models than linear classifiers.

The findings demonstrate the potential of predictive AI to identify patterns associated with future purchase intentions.

20. Rekasiute et al. (2022), in their research paper “Predicting the Category of Customers’ Next Product to Buy in Web Shops,” developed a model for predicting the next product category a customer was likely to purchase based on previous purchase behaviour.

Using anonymised web-shop data, the proposed approach outperformed several existing models. The study provides an analytical foundation for understanding how historical consumer behaviour can be used to anticipate subsequent product choices.

2.1. Literature Review based on Periodicals: -

21. Teepapal (2025) examined AI-enabled personalisation in relation to consumer perceptions and social-media engagement. The study found that AI-enabled personalisation can improve perceptions of usefulness and trust, while privacy concerns may limit its effectiveness. The findings support the importance of usefulness, trust, and privacy in understanding consumer responses to AI-driven marketing.

22. Balekar and Sivaramakrishnan (2025) examined the relationship between AI personalisation, consumer trust, privacy concerns, and purchase intention. The study highlights the role of trust in translating personalised AI experiences into purchase-related outcomes, while privacy concerns may weaken this relationship.

23. Kumari and Laheri (2025) provided a systematic and bibliometric perspective on AI-powered recommender systems and consumer purchasing behaviour. The study offers broader academic context regarding the development of AI recommendation research and its relationship with consumer decision-making.

2.2. Research Gap: -

The existing literature demonstrates that Artificial Intelligence has increasingly transformed marketing through personalised advertising, recommendation systems, predictive analytics, and data-driven consumer targeting. Previous studies have examined recommendation accuracy, perceived relevance, usefulness, trust, privacy, engagement, and purchase intention. Research has also shown that behavioural and transactional data can be used to identify consumer preferences and anticipate future product choices. Recent studies further emphasise transparency, privacy, and consumer trust in determining responses to AI-based personalisation. However, comparatively limited empirical attention has been given to the anticipatory nature of AI-generated recommendations, particularly recommendations that appear to anticipate a consumer's interest or need before the consumer has actively searched for the product. Existing research establishes the effectiveness of personalised and predictive recommendation systems, but less attention has been given to how consumers interpret such anticipatory experiences. These recommendations may be perceived as relevant and useful while also raising concerns about accuracy, trust, privacy, and their influence on purchase decisions.

A further contextual gap exists in relation to college students as a distinct group of digital consumers. Although previous studies have examined Generation Z, university students, e-commerce shoppers, and Indian consumers, the combined role of perceived relevance, accuracy, usefulness, trust, privacy, and purchase influence in the context of predictive AI recommendations remains comparatively under-examined among college students.

Accordingly, the present study examines how college students perceive and respond to AI-generated recommendations that appear to anticipate their interests before an active search. By bringing together predictive AI exposure, perceived relevance, accuracy, usefulness, trust, privacy-related perceptions, and purchase decisions within a single empirical framework, the study provides a consumer-centred perspective on predictive AI marketing and its relationship with purchase decision-making among college students.

III. RESEARCH METHODOLOGY

3.1. Research Design -

The study adopts a quantitative, descriptive, and analytical research design to examine predictive AI marketing and its association with purchase decisions among college students. The descriptive component examines students' exposure to AI-generated recommendations and their perceptions of relevance, accuracy, usefulness, and trust. The analytical component examines the relationships between these dimensions and purchase decisions.

The study follows a cross-sectional survey design, with data collected at a particular point in time to capture respondents' current experiences and perceptions of predictive AI-generated recommendations.

3.2. Research Approach -

The study follows a quantitative research approach based on primary data collected through a structured questionnaire.

This approach enables respondents' experiences and perceptions of predictive AI marketing to be measured systematically and analysed statistically.

The collected data are used to identify response patterns and examine the relationships specified in the research hypotheses.

3.3. Population and Sample -

The population of the study consists of college students who regularly use digital platforms, including social media, search engines, and online-shopping platforms. This group was selected because of its regular exposure to personalised and AI-generated recommendations.

A total of 101 respondents participated in the study. Their responses form the basis of the subsequent analysis.

3.4. Sampling Technique -

The study employed a convenience sampling technique. College students who were accessible to the researcher and willing to participate were invited to complete the questionnaire.

Participation was voluntary, and 101 valid responses were obtained for analysis.

3.5. Data Collection -

The study is based on primary data collected through a structured questionnaire. The questionnaire covered exposure to AI-generated recommendations, recommendations received before an active search, perceived relevance and accuracy, purchase influence, usefulness, trust, online-shopping experience, privacy concerns, and overall perceptions of predictive AI marketing.

The questionnaire was administered to eligible college students, and 101 valid responses were used for the study.

3.6. Research Instrument -

A structured questionnaire was used as the primary research instrument. It was developed in accordance with the research objectives and the major dimensions identified through the literature review.

The questionnaire measured respondents' exposure to predictive AI recommendations, perceived relevance, accuracy, usefulness, trust, purchase influence, online-shopping experience, privacy concerns, and overall perceptions of predictive AI marketing. The structured format ensured consistency and comparability across responses.

3.7. Variables of the Study -

The study examines the following variables:

Independent Variables: Exposure to predictive AI-generated recommendations, perceived relevance, perceived accuracy, perceived usefulness, and trust in AI-generated recommendations.

Dependent Variable: Purchase decision of college students.

Additional Variable: Privacy concern regarding AI-based personalisation is considered as a contextual variable. It is not included as a primary independent variable in hypothesis testing because no separate hypothesis has been formulated for it.

3.8. Ethical Considerations -

Participation in the study was voluntary, and respondents were informed about the general purpose of the research before completing the questionnaire. The collected information was used only for academic purposes.

No personally identifying information was required for the analysis, and respondents' information was

treated confidentially. The findings are presented in aggregated form to protect individual responses.

IV. DATA ANALYSIS AND INTERPRETATION

This section presents the analysis and interpretation of the primary data collected from 101 respondents through the structured questionnaire. The analysis is organised according to the objectives of the study and focuses on respondents' exposure to predictive AI-generated recommendations, their experiences of receiving recommendations before an active search, and their perceptions of relevance, accuracy, usefulness, trust, privacy, and purchase influence.

The responses are presented in a systematic manner using appropriate tables and percentages, followed by a brief interpretation of the findings. The analysis is intended to identify the main patterns in respondents' experiences and perceptions and to provide an empirical basis for examining the proposed relationships between predictive AI marketing and purchase decisions.

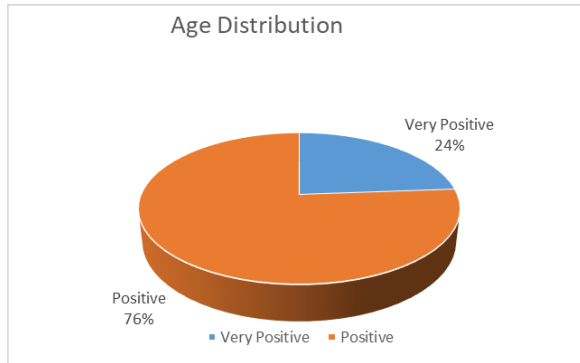
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4.1. Data Analysis and Interpretation – Graphs, Charts, Tables etc.

1. Age Distribution –

Age Group	Frequency	Percentage (%)
16–20 years	68	67.33
21–23 years	33	32.67
Total	101	100.00



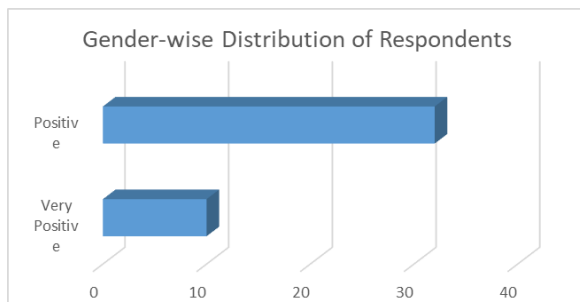
Interpretation:

The table shows that 68 respondents (67.33%) belong to the 16–20 years age group, while 33 respondents (32.67%) are between 21 and 23 years of age. Thus, the sample is predominantly composed of younger respondents.

This distribution is relevant to the present study because the research examines college students' experiences with predictive AI marketing in digital environments, where younger users are likely to have regular interaction with social media, search platforms, and online-shopping services.

2. Gender Distribution –

Gender	Frequency	Percentage (%)
Female	54	53.47
Male	47	46.53
Total	101	100.00



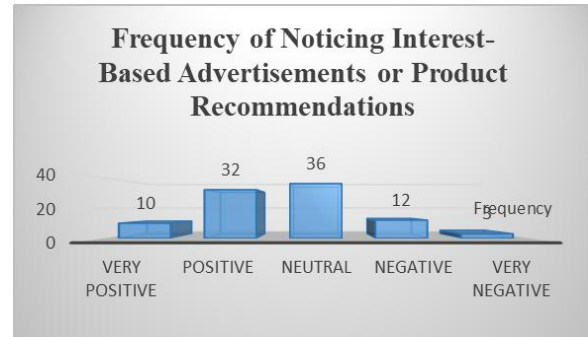
Interpretation:

The sample consists of 54 female respondents (53.47%) and 47 male respondents (46.53%). The distribution is relatively balanced, although female respondents form a slightly larger proportion of the sample.

This provides representation from both groups for examining perceptions and experiences related to predictive AI-generated recommendations and purchase decisions.

3. Frequency of Noticing Interest-Based Advertisements or Product Recommendations-

Response	Frequency	Percentage (%)
Never	8	7.92
Rarely	23	22.77
Sometimes	42	41.58
Often	25	24.75
Very Often	3	2.97
Total	101	100.00



Interpretation:

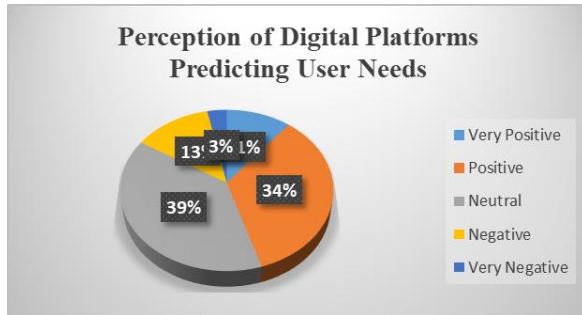
The responses indicate that most participants sometimes notice advertisements or product recommendations that match their interests before actively searching for them, with 42 respondents (41.58%) selecting this option.

A further 25 respondents (24.75%) reported noticing such recommendations often, while 23 respondents (22.77%) noticed them rarely. Only 3 respondents (2.97%) experienced this very often, whereas 8 respondents (7.92%) reported never noticing such recommendations.

Overall, the findings suggest that interest-based recommendations are a noticeable part of the participants' digital experience, although their frequency varies across individuals.

4. Perception of Digital Platforms Predicting User Needs -

Response	Frequency	Percentage (%)
Never	10	9.90
Sometimes	34	33.66
Rarely	22	21.78
Likely	28	27.72
Always	7	6.93
Total	101	100.00

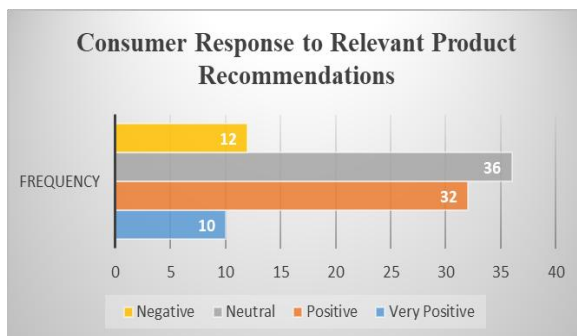


Interpretation:

The responses show that many participants have experienced digital platforms appearing to anticipate their needs before they actively search for something. The largest group selected “Likely,” followed by those who selected “Sometimes.” A smaller number reported that this happened always, while some respondents rarely or never experienced it. Overall, the findings suggest that participants are reasonably aware of predictive recommendations and often perceive digital platforms as capable of anticipating their interests or needs based on their online behaviour.

5. Consumer Response to Relevant Recommendations

Response	Frequency	Percentage (%)
Click on it immediately	11	11.83
Read more about it	42	45.16
Save it for later	31	33.33
Ignore it	9	9.68
Total	93	100.00



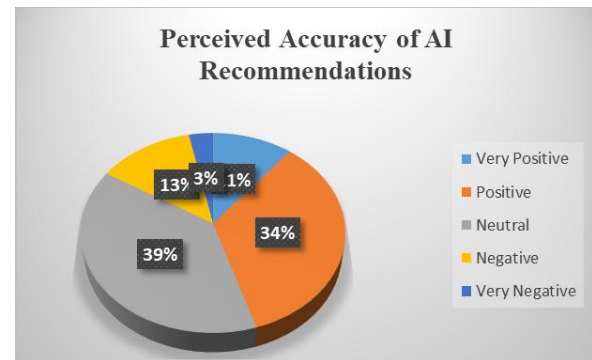
Interpretation:

The findings indicate that respondents generally engage with recommendations when the suggested product matches their interests. The largest group, 42 respondents (45.16%), reported that they usually read more about the product, while 31 respondents (33.33%) preferred to save it for later. Only 11

respondents (11.83%) clicked on the recommendation immediately. This suggests that predictive recommendations can generate consumer interest and encourage further consideration, although most respondents appear to evaluate the product before taking immediate action.

6. Accuracy of AI Recommendations -

Rating	Frequency	Percentage (%)
1 – Not Accurate	5	5.38
2	5	5.38
3	19	20.43
4	31	33.33
5 – Very Accurate	33	35.48
Total	93	100.00



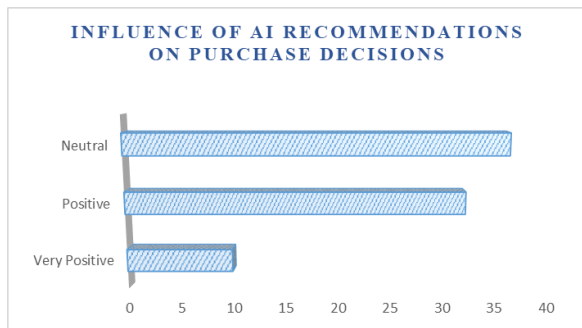
Interpretation:

The results indicate a generally positive perception of the accuracy of AI recommendations. The highest rating of 5 was selected by 33 respondents (35.48%), while 31 respondents (33.33%) gave a rating of 4. Thus, more than two-thirds of the respondents gave the recommendations a high accuracy rating.

In contrast, only a small proportion selected ratings of 1 or 2. This suggests that perceived predictive accuracy may contribute to users' willingness to engage with AI-generated recommendations.

7. Influence of AI Recommendations on Purchase Decisions -

Response	Frequency	Percentage (%)
Yes	26	27.96
No	38	40.86
Not Sure	29	31.18
Total	93	100.00

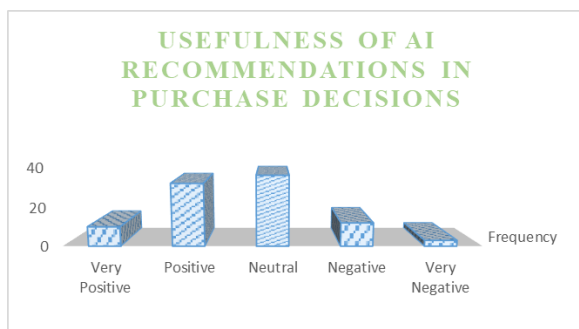


Interpretation:

The findings show that AI recommendations have influenced the purchase decisions of a considerable proportion of respondents, although the effect is not uniform. Twenty-six respondents (27.96%) reported that AI recommendations had influenced a purchase, while 38 respondents (40.86%) reported no such influence. A further 29 respondents (31.18%) were unsure. The results therefore suggest that predictive AI marketing has a measurable influence on purchase decisions for some students, but this influence is moderated by individual responses to recommendations.

8 Usefulness of AI Recommendations in Purchase Decisions –

Rating	Frequency	Percentage (%)
1 – Not Useful	7	7.53
2	15	16.13
3	23	24.73
4	24	25.81
5 – Very Useful	24	25.81
Total	93	100.00



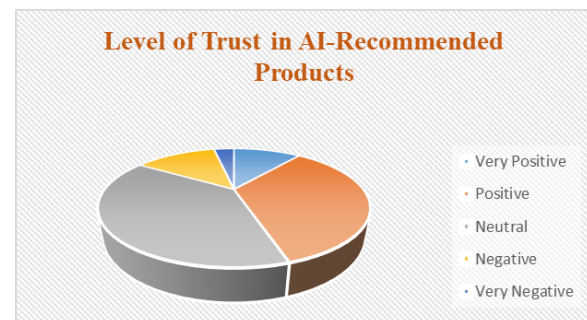
Interpretation:

The findings suggest that AI-based recommendations are considered useful by a substantial proportion of respondents when making purchase decisions. Ratings of 4 and 5 together account for 48 respondents

(51.62%), indicating that more than half of the participants perceive a relatively high level of usefulness. At the same time, 23 respondents (24.73%) remained neutral. Overall, the results indicate that AI recommendations can provide practical support during purchase decisions, particularly when users find the recommendations relevant to their needs.

9 Trust in AI-Recommended Products –

Rating	Frequency	Percentage (%)
1 – Do Not Trust	11	11.83
2	21	22.58
3	18	19.35
4	18	19.35
5 – Completely Trust	23	24.73
Valid Total	91	97.85

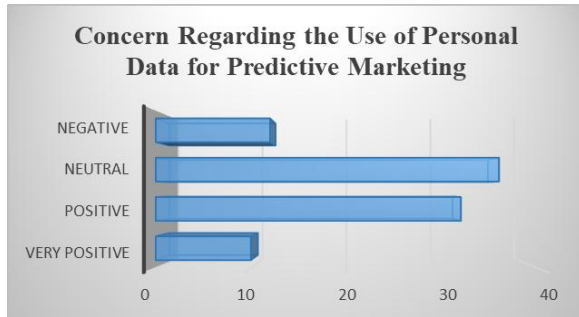


Interpretation:

The responses indicate a mixed level of trust in products recommended by AI systems. Although 23 respondents (24.73%) gave the highest trust rating, a considerable proportion selected low or moderate ratings. This indicates that respondents do not automatically accept AI-generated recommendations as trustworthy and may still evaluate products independently before making a decision. Overall, trust appears to be an important factor that can influence the effectiveness of predictive marketing and the willingness of consumers to act on AI-generated suggestions.

10 Concern Regarding Personal Data Use –

Response	Frequency	Percentage (%)
Highly Concerned	17	18.28
Moderately Concerned	40	43.01
Slightly Concerned	24	25.81
Not Concerned	12	12.90
Total	93	100.00

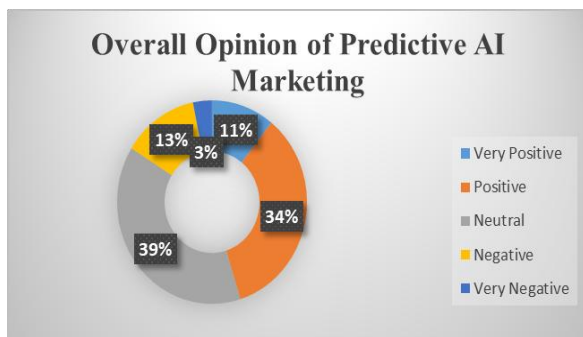


Interpretation:

The findings reveal a clear level of concern among respondents regarding the use of personal data to predict their preferences. The largest group, 40 respondents (43.01%), reported being moderately concerned, while 17 respondents (18.28%) were highly concerned. Only 12 respondents (12.90%) reported having no concern. These results suggest that although students may recognise the convenience of predictive marketing, privacy remains an important consideration that may affect their acceptance of AI-based personalization.

11 Overall Opinion of Predictive AI Marketing –

Response	Frequency	Percentage (%)
Very Positive	10	10.75
Positive	32	34.41
Neutral	36	38.71
Negative	12	12.90
Very Negative	3	3.23
Total	93	100.00



Interpretation:

The overall perception of predictive AI marketing is predominantly neutral to positive. Thirty-six respondents (38.71%) expressed a neutral opinion, while 32 respondents (34.41%) viewed predictive AI marketing positively and 10 respondents (10.75%) viewed it very positively. Only a small proportion expressed negative or very negative opinions. The findings suggest that students generally recognise the potential benefits of predictive AI marketing, although a significant neutral response indicates that acceptance may depend on factors such as accuracy, usefulness, trust and privacy.

4.2 Inferential Analysis:

Descriptive findings establish the prevalence and distribution of respondents' perceptions regarding predictive AI recommendations. To further examine whether these perceptions are statistically associated with purchase-related behaviour, inferential analysis was undertaken. The analysis focuses on the relationship between selected characteristics of AI-generated recommendations and respondents' reported purchase influence. The analysis considers perceived relevance, perceived accuracy, perceived usefulness, and trust as key explanatory dimensions, while reported influence of AI recommendations on purchase decisions is treated as the principal outcome variable.

4.3 Hypothesis Testing:

Based on the research objectives and the conceptual framework of the study, five hypotheses were formulated to examine the relationship between predictive AI marketing and consumers' purchase decisions. The hypotheses were empirically examined using the Chi-square test of independence at a 5% level of significance ($\alpha = 0.05$). The reported purchase influence (Q13) was considered the principal outcome variable, while exposure, perceived relevance, perceived accuracy, perceived usefulness, and trust represented the respective explanatory dimensions.

Hypothesis	Relationship Tested	χ^2	df	p-value	Decision
H1	Exposure to predictive AI recommendations $\times$ Purchase decisions	6.965	8	0.540	Not supported
H2	Perceived relevance $\times$ Purchase decisions	7.911	6	0.245	Not supported
H3	Perceived accuracy $\times$ Purchase decisions	6.725	8	0.567	Not supported

H4	Perceived usefulness × Purchase decisions	11.011	8	0.201	Not supported
H5	Trust in predictive AI recommendations × Purchase decisions	4.022	8	0.855	Not supported

Note: Statistical significance was assessed at $\alpha = 0.05$. Q15 contains two missing responses; therefore, the H5 analysis is based on 99 valid observations, whereas the remaining tests use 101 observations.

4.3.1. Interpretation of Hypothesis Testing -

The hypothesis testing results indicate that none of the five examined relationships reached statistical significance at the 5% level. The association between exposure to predictive AI recommendations and purchase decisions was not statistically significant ($\chi^2 = 6.965$, $p = 0.540$), providing insufficient evidence to support H1. Similarly, perceived relevance did not demonstrate a statistically significant association with purchase decisions ($\chi^2 = 7.911$, $p = 0.245$), and therefore H2 was not supported.

Perceived accuracy also failed to demonstrate a statistically significant association with purchase decisions ($\chi^2 = 6.725$, $p = 0.567$), resulting in H3 not being supported. Although perceived usefulness exhibited the comparatively largest chi-square statistic among the examined relationships, the association remained statistically non-significant ($\chi^2 = 11.011$, $p = 0.201$); consequently, H4 was not supported.

Finally, trust in predictive AI recommendations showed the weakest statistical evidence of association with purchase decisions ($\chi^2 = 4.022$, $p = 0.855$). Hence, H5 was not supported.

4.3.2 Overall Hypothesis Conclusion -

Overall, the empirical results do not provide sufficient statistical evidence to support H1–H5 at the 5% significance level. Although the descriptive findings demonstrate that respondents encounter, evaluate and engage with predictive AI recommendations, the inferential results suggest that exposure, perceived relevance, accuracy, usefulness and trust, when considered individually, do not exhibit statistically significant associations with reported purchase influence in the present sample. The findings should be interpreted as evidence of statistical association rather than causation, as the cross-sectional survey design does not permit causal inference.

V. DISCUSSION OF FINDINGS

The findings suggest that predictive AI marketing has become an important component of the digital consumer environment among college students. Although respondents generally recognise the relevance, accuracy and usefulness of AI-generated recommendations, their responses indicate that recommendations primarily support product awareness and consideration rather than directly determining purchase decisions. The mixed levels of trust and continuing privacy concerns further suggest that consumer acceptance of predictive AI depends not only on personalisation but also on transparency and responsible use of personal data. Moreover, the non-significant results for H1–H5 indicate that the examined AI-related factors cannot, individually, be considered statistically significant determinants of purchase decisions within the present sample.

Overall, predictive AI appears to function as a decision-support mechanism, while the final purchase decision remains subject to broader consumer considerations.

- Predictive AI exposure: Respondents frequently encounter personalised advertisements and product recommendations aligned with their interests.
- Recommendation relevance: AI-generated recommendations were generally perceived as relevant to respondents' interests, although the level of relevance varied.
- Consumer engagement: When recommendations matched their interests, respondents were more likely to read more about the product or save it for later rather than purchase immediately.
- Predictive accuracy: Respondents generally perceived AI recommendations as reasonably accurate in predicting their interests.
- Purchase influence: AI recommendations influenced purchases for a proportion of respondents, but the influence was not universal.
- Usefulness: Respondents generally viewed AI-based recommendations as useful during purchase-related decision-making.

- Trust: Trust in AI-recommended products was mixed, indicating that consumers do not rely on AI recommendations uncritically.
- Privacy: Personal-data usage for predictive recommendations remains an important concern among respondents.
- Overall perception: Respondents demonstrated a generally receptive but cautious attitude towards predictive AI marketing.
- Hypothesis testing: None of the five proposed relationships (H1–H5) achieved statistical significance at the 5% level.
- Overall finding: Predictive AI recommendations appear to support product awareness and consideration, but the present findings do not establish that they independently determine purchase decisions.

VI. CONCLUSION

- The study concludes that predictive AI marketing has become a significant part of the digital consumer environment among college students. AI-generated recommendations are generally perceived as relevant, accurate and useful, and they contribute to product awareness and consideration. However, the findings indicate that such recommendations do not necessarily translate directly into purchase decisions.
- The hypothesis testing results further show that the proposed relationships between exposure, relevance, accuracy, usefulness, trust and purchase decisions were not statistically significant at the 5% level. Therefore, predictive AI should not be viewed as an independent determinant of consumer purchasing behaviour. Rather, its effectiveness appears to depend on broader factors such as consumer evaluation, trust, perceived usefulness and privacy expectations.
- Overall, the study highlights the potential of predictive AI to support consumer decision-making while emphasising the need for responsible, transparent and consumer-centric personalisation practices.

VII. PRACTICAL IMPLICATIONS: -

The findings have several practical implications for organisations using predictive AI marketing. First, AI-based personalisation should be treated as a decision-support mechanism rather than a guaranteed driver of purchase behaviour. Marketers should therefore focus on improving the relevance and usefulness of recommendations rather than relying solely on increased personalisation.

Second, the findings highlight the importance of consumer trust and privacy. Organisations using predictive AI should adopt transparent data practices and provide consumers with greater control over how their information is used.

Finally, the absence of statistically significant relationships across the proposed hypotheses suggests that organisations should avoid assuming that predictive recommendations alone will determine purchasing behaviour. A more consumer-centric approach, combining personalisation with transparency, relevance and responsible data use, is likely to provide greater long-term value.

7.1 Recommendations: -

Based on the findings of the study, the following recommendations are proposed:

1. Improve recommendation relevance: AI systems should prioritise current consumer needs and interests rather than relying solely on historical browsing behaviour.
2. Strengthen transparency: Platforms should clearly communicate when recommendations are generated using AI and, where appropriate, provide understandable reasons for why particular products are being recommended.
3. Prioritise data privacy: Consumer data should be collected and used responsibly, with clear consent mechanisms and greater user control over personalised recommendations.
4. Build consumer trust: Marketers should ensure that AI-recommended products are credible, relevant and not excessively promotional.
5. Avoid excessive personalisation: Frequent or highly targeted recommendations may create discomfort. Recommendation systems should maintain an appropriate balance between personalisation and user autonomy.

6. Support informed decision-making: AI recommendations should provide useful product information and comparisons rather than encouraging impulsive purchasing.
7. Adopt consumer-centric AI marketing: Organisations should evaluate recommendation effectiveness not only through clicks or conversions but also through consumer satisfaction, trust and perceived usefulness.
8. Regularly evaluate AI systems: Recommendation algorithms should be periodically assessed for accuracy, relevance and unintended biases to ensure consistent consumer value.

7.2 Overall Recommendation -

Predictive AI marketing should be developed as a transparent, privacy-conscious and consumer-centric decision-support mechanism rather than solely as a tool for increasing purchase conversions.

VIII. LIMITATIONS OF THE STUDY -

- The study is based on a sample of 101 respondents, which may limit the generalizability of the findings to a broader population.
- The study focuses specifically on college students; therefore, the findings may not fully represent the perceptions and purchasing behaviour of consumers from other age groups or demographic backgrounds.
- The study relies on self-reported responses, which may be influenced by individual perceptions, experiences, and response tendencies.
- The cross-sectional design of the study captures respondents' perceptions at a particular point in time and therefore does not permit conclusions regarding causal relationships between predictive AI marketing and purchase decisions.
- The study examines selected dimensions of predictive AI marketing, including exposure, perceived relevance, accuracy, usefulness and trust. Other potentially influential factors, such as algorithmic transparency, perceived intrusiveness and consumer satisfaction, were beyond the scope of the present study.

8.1 Future Research -

Future research may extend the present study by examining larger and more diverse samples across

different age groups, occupations and geographical contexts to improve the generalizability of the findings. Comparative studies across different demographic groups and digital platforms may provide further insight into variations in consumer responses to predictive AI marketing.

Further research may also examine additional dimensions such as algorithmic transparency, perceived intrusiveness, privacy, consumer satisfaction and trust to develop a more comprehensive understanding of AI-driven personalisation. Longitudinal studies could additionally examine how consumer perceptions and purchasing responses evolve as predictive AI technologies become more integrated into digital marketing environments.

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APPENDIX A: RESEARCH QUESTIONNAIRE

RESEARCH QUESTIONNAIRE -

Title of the Study: - “When AI Knows What You Want Before You Search: Impact of Predictive Marketing on Purchase Decisions among College Students.”

Purpose of the Questionnaire: - This questionnaire is designed to examine college students’ exposure to predictive AI-generated recommendations, their perceptions of such recommendations, and their influence on purchase-related decisions. The information collected is intended solely for academic research purposes.

Instructions

Please select the response that best reflects your experience or opinion. Where an open-ended response is provided, answer briefly and honestly.

Section A: Demographic Profile -

1. Name: _____

2. Age:

- 16–20 years
- 21–23 years
- Above 23 years

3. Gender:

- Male
- Female

4. Class / Course / College Name:

Section B: Exposure to Predictive AI Recommendations

5. How frequently do you notice advertisements or product recommendations that correspond to your interests before you actively search for them?

- Never
- Rarely
- Sometimes
- Often
- Very Often

6. Have you ever experienced a situation where a digital platform appeared to anticipate what you wanted before you searched for it?

- Never
- Rarely
- Sometimes
- Often
- Always

7. How relevant are AI-generated recommendations to your actual needs or interests?

- Not Relevant
- Slightly Relevant
- Moderately Relevant
- Highly Relevant

8. How frequently do you notice product recommendations on social media or online shopping applications?

- Never
- Rarely
- Sometimes
- Often
- Very Often

9. Which digital platforms provide you with the most personalised recommendations?

- Instagram
- YouTube
- Amazon / Flipkart
- Google
- Facebook
- Other: _____

10. Have you noticed products or services being recommended to you before you actively searched for them?

- Always

- Often
- Sometimes
- Rarely
- Never

Section C: Perceptions and Purchase Influence

11. What do you usually do when an AI-generated product recommendation matches your interests?

- Click on it immediately
- Read more about it
- Save it for later
- Ignore it

12. How accurate are AI-generated recommendations in predicting your interests?

1 = Not Accurate | 5 = Very Accurate

- 1
- 2
- 3
- 4
- 5

13. Have AI-generated recommendations ever influenced a purchase you made?

- Yes
- No
- Not Sure

14. How useful do you find AI-based recommendations when making purchase decisions?

1 = Not Useful | 5 = Very Useful

- 1
- 2
- 3
- 4
- 5

15. To what extent do you trust products recommended by AI systems?

1 = Do Not Trust | 5 = Completely Trust

- 1
- 2
- 3
- 4
- 5

16. Do personalised recommendations improve your online shopping experience?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Section D: Privacy and Overall Perception

17. To what extent are you concerned about your personal data being used to predict your preferences?

- Highly Concerned
- Moderately Concerned
- Slightly Concerned
- Not Concerned

18. What is your overall perception of predictive AI marketing?

- Very Positive
- Positive
- Neutral
- Negative
- Very Negative

19. In one sentence, how would you describe your experience with AI-generated recommendations?

20. If predictive AI marketing could accurately anticipate your needs and preferences, would you be comfortable allowing companies to use your personal data to provide more personalised recommendations? Please explain why or why not.