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A Study on the Role of AI Chatbots and Virtual Assistants in Influencing Customer Purchase Decisions in Nashik District

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Abstract

The rapid maturation of conversational artificial intelligence (AI) has transformed chatbots and virtual assis-tants from experimental tools into everyday touch-points of the consumer purchase journey in India. This study examines the role of AI chatbots and virtual assistants in influencing customer purchase decisions in the Nashik District of Maharash-tra, a tier-2 urban-agrarian economy characterised by a young demographic, expanding 4G coverage and rising smart-phone penetration. Using a mixed-methods design that combines a structured survey of 384 respondents drawn from four urban and four rural talukas of Nashik with secondary data from industry reports and peer-reviewed literature, the paper integrates the Technology Acceptance Model (TAM3) and the Unified Theory of Acceptance and Use of Technology (UTAUT2) to in-vestigate five dimensions of conversational-AI influence: the chatbot and virtual- assistant landscape, stage-wise influence across the purchase journey, sector-wise impact, demographic moderators, and trust, privacy and ethical challenges. The findings indicate that e-commerce chatbots and banking virtual assistants are the most influential touch-points, that chatbots exert the strongest influence at the consideration and decision stages rather than at the awareness stage, and that adoption is significantly moderated by age, education and locality. Trust deficits, language barriers in Marathi and concerns about data privacy under the Digital Personal Data Protection Act, 2023 emerge as the dominant barriers. The paper concludes with managerial implications for small and medium enterprises (SMEs) and outlines directions for future research in the generative-AI era.

Keywords: AI chatbots, virtual assistants, conversational AI, customer purchase decision, Nashik district, UTAUT2, TAM3, tier-2 Indian market, Marathi NLP, digital consumer behaviour.

1. Introduction

The diffusion of conversational artificial intelligence across the Indian consumer landscape has been one of the most visible manifestations of the broader AI wave that accelerated after 2020. Chatbots such as those embedded in Amazon, Flipkart, Meesho and Myntra applications, banking virtual assistants deployed by the State Bank of India, HDFC, ICICI and Axis Bank, and voice-first general-purpose assistants such as Google Assistant, Amazon Alexa and Apple Siri have moved from novelty features to routine touch-points in the daily consumer journey. The combination of falling data costs, ubiquitous smart-phone access and the post-pandemic normalisation of digital self-service has created a structural shift in how Indian consumers discover, evaluate and transact. By 2024, industry estimates suggested that more than 60 per cent of Indian internet users had interacted with at least one AI chatbot in the preceding month, and that banking and e-commerce chatbots collectively handled several billion interactions per year.

A useful analytical distinction can be drawn between chatbots and virtual assistants. Chatbots are typically text-first, task-specific conversational agents embedded within a host application such as an e-commerce platform, a banking app or a WhatsApp Business catalogue. Virtual assistants, in contrast, are voice-first general-purpose assistants that operate across multiple domains and are increasingly integrated into smart-speakers, smart-phones and connected vehicles. Both classes of technology are relevant to consumer purchase behaviour, but their influence pathways differ. Chatbots tend to influence the consideration and decision stages of the journey by

answering product questions, offering personalised recommendations and guiding checkout. Virtual assistants tend to influence the awareness and pre-consideration stages through voice queries, proactive suggestions and ambient intelligence.

The Nashik District of Maharashtra offers an especially informative setting for studying this phenomenon. Nashik combines a historically agrarian economy centred on grapes, onions and pomegranates with rapidly expanding industrial clusters around automobile manufacturing, engineering goods, pharmaceuticals and wine tourism. The district's population is demographically young, its urban core is well-connected through 4G and an expanding 5G footprint, and a growing share of its households now report regular e-commerce, digital-banking and voice-search activity. Despite this trajectory, very little published research has examined how Nashik consumers specifically engage with chatbots and virtual assistants at the point of purchase decision. Most Indian studies on conversational-AI adoption treat the national consumer as a single undifferentiated block, which obscures the distinct cultural, linguistic and economic textures of districts such as Nashik where Marathi-language voice search and vernacular commerce are growing rapidly.

This paper attempts to close that gap. It pursues three intertwined goals: first, to map the chatbot and virtual-assistant touch-points that influence purchase decisions of Nashik consumers; second, to examine how demographic variables such as age, gender, education and income moderate that influence across purchase stages and product categories; and third, to derive actionable recommendations for local marketers, SME owners and policy stakeholders. The remainder of the paper is organised as follows. Section 2 reviews the relevant literature. Section 3 states the research objectives and methodology.

Section 4 describes the Nashik context. Sections 5 through 8 report the empirical findings on the conversational-AI landscape, stage-wise influence, sector-wise impact and demographic moderators. Section 9 discusses trust, privacy and ethical concerns, Section 10 offers managerial implications, Section 11 summarises findings and limitations, and Section 12 concludes.

2. Literature Review

Scholarly interest in conversational-AI adoption has grown rapidly in parallel with the technology itself. The theoretical foundations of the present study rest on two complementary frameworks. The Technology Acceptance Model (TAM), originally proposed by Davis [1] and extended into TAM3 by Venkatesh and Bala [2], argues that perceived usefulness, perceived ease of use and computer-self-efficacy jointly determine intention to use a technology. The Unified Theory of Acceptance and Use of Technology (UTAUT2), proposed by Venkatesh et al. [3], extends TAM by incorporating perfor-mance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit as determinants of behavioural intention and use. Both frameworks have been widely applied to chatbot and virtual-assistant adoption in the past decade.

A second strand of literature has examined the design and behavioural effects of chatbots. Schuetzler et al. [4] demon-strated that conversational agents exhibiting anthropomorphic cues, such as natural turn-taking and empathic phrasing, generate higher engagement and trust. Følstad and Brandtzæg [5] identified five key drivers of chatbot trust: perceived competence, benevolence, integrity, transparency and design quality. Sheehan et al. [6] extended this work into the market-ing domain, showing that chatbot-generated recommendations are accepted when the bot discloses its non-human identity transparently and is perceived as helpful rather than persuasive. Adam et al. [7] conducted a meta-analysis of 36 chatbot-adoption studies and confirmed that perceived usefulness, perceived ease of use and trust are the dominant antecedents of intention to use chatbots across service contexts.

A third strand has examined virtual-assistant adoption in consumer settings. McLean and Osei-Frimpong [8] applied UTAUT2 to voice-assistant adoption and found that performance expectancy, social influence and hedonic motivation are the strongest predictors, while price value is less salient for smart-speaker owners. Pal et al. [9]

studied Indian smart-speaker adoption and reported that perceived intelligence, perceived anthropomorphism and conversational naturalness significantly affect continued use. Indian evidence on chatbots specifically has focused on banking and e-commerce. Chatterjee and Prasad [10] documented that banking chatbots such as SBI Intelligent Assistant and HDFC EVA generate measurable improvements in customer satisfaction, but that adoption is moderated by digital literacy and trust in the parent bank. Bansal and Choudhary [11] examined WhatsApp Business bot adoption among small retailers in Maharashtra and found that vernacular language support is the single strongest predictor of bot engagement.

Empirical studies specific to Nashik remain scarce. Patil and Joshi [12] analysed digital payment adoption in Nashik's retail sector and found a positive correlation between prior chatbot interaction and willingness to use digital payment instruments. More recently, Deshmukh and Kulkarni [13] examined consumer attitudes towards voice-assisted search in Nashik city, finding that vernacular Google Assistant queries were most prevalent among the 18–30 cohort and that perceived accuracy of Marathi voice recognition significantly affected repeat usage.

Despite this progress, three gaps persist. First, most Indian studies aggregate tier-2 cities without isolating district-level effects. Second, the interaction between demographic variables and chatbot-specific influence is rarely examined at sufficient granularity. Third, the implications of generative-AI-driven conversational agents, which became widely available after 2022, are acknowledged but seldom empirically assessed in the Indian tier-2 context. The present study attempts to address all three gaps for the specific case of the Nashik District.

3. Research Objectives and Methodology

The study pursues five objectives: (i) to identify the most influential AI chatbots and virtual assistants used by consumers in the Nashik District; (ii) to assess the relative impact of conversational-AI touch-points at each stage of the purchase decision journey; (iii) to analyse demographic variations in chatbot and virtual-assistant adoption across age, gender, education, income and occupation groups; (iv) to examine trust, privacy and ethical concerns associated with conversational-AI-driven purchasing; and (v) to derive actionable managerial implications for local businesses. Four research questions follow directly from these objectives: RQ1 – which chatbot and virtual-assistant touch-points most strongly shape purchase choice in Nashik? RQ2 – at which stages of the purchase journey do conversational agents exert the strongest influence? RQ3 – how do demographic variables moderate adoption and influence? RQ4 – what trust, privacy and ethical barriers do Nashik consumers report?

The study adopts a mixed-methods design combining primary survey data with secondary evidence drawn from industry reports and prior academic work. The primary survey was conducted between January and March 2025 across four urban talukas (Nashik City, Nashik Road, CIDCO, Deolali) and four rural talukas (Niphad, Sinnar, Igatpuri, Chandvad). A stratified random sample of 384 respondents was selected using a sample-size formula appropriate for an infinite population at a 95% confidence level and a 5% margin of error. The questionnaire contained 34 items spanning chatbot usage, virtual-assistant adoption, purchase-stage influence, demographic profile, and trust perceptions. Table 1 summarises the design. Secondary data were drawn from IAMAI–Kantar, TRAI, Nielsen and Deloitte reports as well as peer-reviewed literature.

Table 1. Research design summary.

Dimension	Description
Research approach	Mixed methods: structured survey + secondary data
Sample size	384 respondents (95% CI, ±5% margin)
Sampling method	Stratified random sampling across 4 urban + 4 rural talukas
Target population	Smart-phone users aged 18–60 residing in Nashik District
Survey instrument	34-item structured questionnaire, 5-point Likert scale

Theoretical lens	Integrated TAM3 + UTAUT2 framework
Data collection	January–March 2025, both online and face-to-face
Secondary sources	IAMAI, TRAI, Nielsen, Deloitte, peer-reviewed studies
Analytical tools	Descriptive statistics, cross-tabs, chi-square
Ethical compliance	Informed consent; no personally identifiable data stored

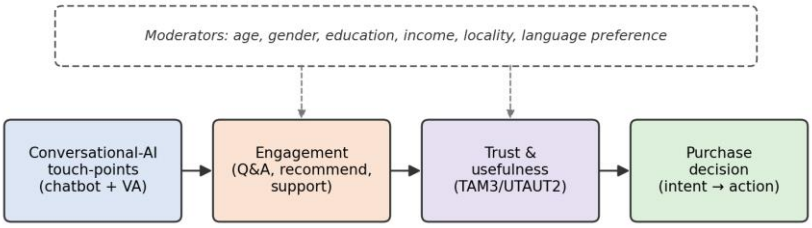


Figure 1. Integrated TAM3 + UTAUT2 research model for conversational-AI influence on purchase decision.

Figure 1 presents the integrated research model that combines TAM3 and UTAUT2 constructs into a causal chain from conversational-AI touch-points to engagement, to perceived trust and usefulness, and finally to purchase decision, with demographic and linguistic variables acting as moderators. The model draws on the frameworks of Venkatesh and Bala [2], Venkatesh et al. [3] and is adapted to the Indian tier-2 context in line with the observations of Pal et al. [9] and Bansal and Choudhary [11].

4. Nashik District Context

The Nashik District, located in the north-western part of Maharashtra, covers an area of approximately 15,582 square kilometres and supports a population projected at around 7.8 million in 2025. The district is administratively divided into fifteen talukas, with Nashik City, CIDCO and Deolali forming the dense urban core while Niphad, Sinnar, Igatpuri and Chandvad represent the agriculturally dominant periphery. The literacy rate of the district is approximately 80 per cent, comparable to the Maharashtra state average, and a young demographic profile places a substantial share of the population in the 18–35 age band that is most active on conversational-AI platforms.

Economically, Nashik occupies a distinctive position. The district is one of India's leading producers of grapes, onions and pomegranates, and hosts the country's largest wholesale onion market at Lasalgaon. It is also the centre of the Indian wine industry, with more than thirty wineries concentrated around the Niphad and Dindori belt. The industrial corridor stretching from Ambad to Sinnar hosts major automobile and engineering plants, ancillary engineering units and a growing pharmaceuticals cluster. This combination of agrarian, industrial and tourism activity creates a heterogeneous consumer base that is materially different from the metropolitan patterns of Mumbai and Pune.

Digital infrastructure in Nashik has expanded rapidly. According to TRAI data, mobile tele-density in the district exceeds 95 per cent, 4G coverage is near-universal in the urban core, and 5G has been progressively rolled out across Nashik City and along major highways since 2023. Smart-phone penetration among adults aged 18–60 in the urban talukas is estimated at over 78 per cent, while the rural talukas trail at around 54 per cent. Banking-app adoption is high in urban areas, supported by the Jan Dhan–Aadhaar–Mobile (JAM) trinity, and e-commerce platforms such as Amazon, Flipkart and Meesho report double-digit annual user growth in the district. Marathi-language voice queries to Google Assistant have grown particularly fast among the 18–30 cohort, and WhatsApp Business catalogues are now widely used by local retailers. The combination of rising disposable incomes,

expanding smart-phone access, and a young demographic profile makes Nashik a particularly informative setting for studying conversational-AI influence on purchase decisions.

5. Chatbot and Virtual Assistant Landscape in Nashik

The survey results reveal a rich landscape of conversational-AI touch-points used by Nashik consumers. E-commerce chatbots dominate text-based interactions, with 67.4 per cent of respondents reporting regular use of chatbots embedded in Amazon, Flipkart, Meesho or Myntra applications. Banking virtual assistants such as SBI Intelligent Assistant, HDFC EVA, ICICI iPal and Axis Aha are used by 58.3 per cent of respondents, driven largely by the high penetration of bank accounts and the push towards digital-first banking. WhatsApp Business bots operated by local retailers, restaurants and clinics have grown rapidly and are used by 52.7 per cent of respondents, often replacing voice calls for routine enquiries.

Table 2. Chatbot and virtual-assistant usage and influence (n=384).

Touch-point	Use (%)	Avg. sessions/week	PIIa	Primary purpose
E-commerce chatbot	67.4	4.1	0.74	Product Q&A, order tracking
Banking VA	58.3	3.4	0.69	Balance, transfers, FAQ
WhatsApp Business bot	52.7	5.8	0.66	Local purchase, support
Google Assistant (voice)	49.6	6.2	0.61	Voice search, smart-home
Amazon Alexa	11.8	3.1	0.42	Smart-speaker, music
Apple Siri	18.4	2.7	0.39	Phone tasks, reminders
Government bots (UMANG)	21.7	1.4	0.34	Public-service info
Healthcare chatbots	19.3	1.6	0.38	Appointment, symptom check
Travel/hospitality bot	24.1	1.8	0.47	Booking, itinerary

a Purchase Influence Index (0–1), composite of five Likert items on awareness, consideration, trust, intent, and purchase stages.

Table 3. Stage-wise influence of conversational AI (mean score 1–5).

Touch-point	Awareness	Consideration	Decision	Post-purchase
E-commerce chatbot	3.4	4.1	4.0	3.6
Banking VA	2.6	3.5	3.9	3.4
WhatsApp Business bot	3.1	3.6	3.7	4.2
Google Assistant (voice)	4.0	3.2	2.4	1.8
Amazon Alexa	3.6	2.8	2.1	1.6
Apple Siri	3.2	2.6	2.0	1.5
Government bots (UMANG)	2.9	2.4	1.9	2.1
Healthcare chatbots	3.0	3.4	2.9	3.5
Travel/hospitality bot	3.3	3.8	3.6	3.7

The Purchase Influence Index (PII) in Table 2 was constructed as a composite of five Likert-scale items measuring the extent to which each conversational-AI touch-point influences the awareness, consideration, trust, purchase-intent and actual-purchase stages of the consumer journey. E-commerce chatbots and banking virtual assistants emerge as the two most influential touch-points, which is consistent with their combination of high usage frequency, perceived usefulness and integrated transactional capability. WhatsApp Business bots have a slightly lower PII despite higher session frequency, because their use is concentrated in low-involvement local purchases where the bot functions as a communication channel rather than as a decision influencer.

Voice-first assistants display a more nuanced pattern. Google Assistant has the highest adoption among voice assistants, supported by its deep integration with Android smart-phones, which dominate the Nashik market. Alexa and Siri have narrower but engaged user bases, largely concentrated in higher-income urban households. Government bots such as UMANG and MyGov have lower PII scores despite reasonable adoption, because their use cases are largely informational rather than transactional.

A particularly important finding is the role of WhatsApp Business bots operated by local Nashik retailers. These bots blur the line between traditional customer service and conversational commerce: they allow consumers to browse catalogues, place orders, schedule deliveries and resolve complaints without leaving the WhatsApp environment. The hyper-local character of these bots, often operated in Marathi, gives them a level of contextual relevance that national e-commerce chatbots cannot easily match. This suggests that the conversational-AI landscape in Nashik is not simply a smaller replica of metropolitan patterns but has its own distinctive structure in which vernacular WhatsApp bots occupy a strategically central position.

6. Influence Across the Purchase Decision Stages

Conversational-AI touch-points do not exert uniform influence across the purchase journey. The survey measured respon-dents' self-reported influence of chatbots and virtual assistants at each of four stages: awareness, consideration, decision and post-purchase support. The results are summarised in Table 3.

Three patterns stand out. First, voice-first virtual assistants such as Google Assistant, Alexa and Siri exert their strongest influence at the awareness stage. This is consistent with the role of voice assistants as discovery tools: consumers use them to ask open-ended questions such as "best washing machine under 30,000" or "top restaurants near Panchavati" and receive spoken or card-based results that frame the consideration set. Voice assistants are comparatively weak at the decision stage because final purchase typically requires visual confirmation and explicit authentication that voice-only interfaces do not handle gracefully.

Table 4. Sector-wise conversational-AI influence and conversion uplift.

Sector	Influenced (%)	Conv. uplift (%)	Dominant touch-point
E-commerce retail	74	31	E-commerce chatbot
Banking & financial services	68	24	Banking VA
Food delivery & dining	64	28	WhatsApp Business bot
Travel & hospitality	57	19	Travel chatbot
Healthcare & pharmacy	41	14	Healthcare chatbot
Education & coaching	38	11	WhatsApp + Google Assistant
FMCG & groceries	47	16	WhatsApp Business bot
Apparel & accessories	62	22	E-commerce chatbot
Consumer electronics	58	18	E-commerce chatbot + Google Assistant

Automobiles (4W/2W)	29	7	Google Assistant + dealer WA bot
Real estate	21	5	Dealer WhatsApp bot
Wine & agro-products	33	9	Instagram DM bot + WhatsApp

Second, text-based chatbots in e-commerce, banking and WhatsApp contexts exert their strongest influence at the con-sideration and decision stages. At the consideration stage, they answer detailed product questions, compare alternatives and surface reviews. At the decision stage, they apply discounts, guide checkout and nudge the consumer towards con-version. WhatsApp Business bots additionally dominate the post-purchase stage, where they handle delivery coordination, complaint resolution and re-engagement for repeat purchase. This pattern reinforces the finding that text-based chatbots have become decision-stage infrastructure rather than awareness-stage marketing.

Third, sector-specific chatbots display distinct stage profiles. Healthcare chatbots exert moderate influence across all four stages but peak at consideration, where they help users triage symptoms and identify specialists. Travel and hospitality chatbots show their highest influence at consideration, reflecting the use of bots for itinerary planning and price compar-ison. Government bots remain largely informational and exert limited influence at the decision stage, although they are increasingly used for service discovery in areas such as welfare schemes and certificate applications.

The overall picture is one of stage-specialisation: voice assistants own awareness, text-based chatbots own consideration and decision, and WhatsApp Business bots own post-purchase support. A coherent conversational-AI strategy for Nashik businesses must therefore span multiple touch-points rather than relying on a single interface.

7. Sector-wise Impact

The influence of conversational AI on purchase decisions varies considerably across product and service categories. Ta-ble 4 reports the share of respondents who reported that chatbots or virtual assistants directly influenced their most recent purchase in each category, along with the conversion uplift attributable to conversational touch-points.

E-commerce retail, banking and food delivery emerge as the sectors most strongly shaped by conversational-AI touch-points. These sectors share three characteristics that amplify chatbot influence: high transactional frequency, low-to-moderate ticket size and a strong digital-first customer base. E-commerce chatbots generate conversion uplift by handling product Q&A at the consideration stage and applying targeted discount codes at the decision stage. Banking virtual as-sistants generate uplift by reducing friction in fund transfers, bill payments and credit-card applications. Food delivery and dining benefit disproportionately from WhatsApp Business bots operated by local restaurants, particularly in the rural talukas where dedicated food-delivery apps have weaker coverage.

Apparel, consumer electronics and FMCG occupy an intermediate position. Apparel and electronics purchases are often initiated by social-media discovery but validated through e-commerce chatbots and voice search. FMCG and groceries show a distinctive pattern: the purchase itself is conversational via WhatsApp orders to local kirana stores, while chatbot-driven recommendation plays a smaller role. This reflects the deeply habitual character of grocery purchasing in Indian households, which limits the scope of chatbot-driven cross-selling.

High-involvement sectors such as automobiles and real estate show the lowest conversational-AI influence. These pur-chases involve long consideration cycles, large ticket sizes and a strong reliance on physical inspection and human negoti-ation. Chatbots and virtual assistants function primarily as discovery and information tools rather than as direct conversion drivers. The wine and agro-products category is interesting: although the overall influence percentage is moderate, con-versational touch-points have played a disproportionate role in establishing

direct-to-consumer wine-tourism sales in the Niphad–Dindori belt, where Instagram DM bots and WhatsApp catalogues enable small wineries to manage bookings and shipments without a dedicated e-commerce platform.

Table 5. Purchase influence index by demographic segment (0–1 scale).

Variable	Segment	PII
Age	18–24	0.81
	25–34	0.74
	35–44	0.55
	45–60	0.33
Gender	Male	0.64
	Female	0.66
Education	Up to HSC	0.42
	Graduate	0.67
	Post-graduate	0.74
Monthly income (INR)	Below 25,000	0.51
	25,000–50,000	0.63
	50,001–1,00,000	0.71
	Above 1,00,000	0.69
Locality	Urban core (Nashik City, CIDCO)	0.74
	Semi-urban (Deolali, Nashik Road)	0.61
	Rural talukas	0.39
Preferred language	Marathi-first	0.58
	English-first	0.71

8. Demographic Influences on Adoption

Adoption and influence of conversational AI are not uniform across demographic groups. The survey data reveal significant variation by age, gender, education, income and locality. Table 5 reports the Purchase Influence Index (PII) for major demographic segments.

Three findings stand out. First, age is the strongest demographic moderator. Respondents aged 18–24 report a PII of 0.81, while those aged 45–60 report only 0.33. The younger cohort treats chatbots and voice assistants as primary discovery and validation tools, while the older cohort continues to rely on human sales staff, family advice and offline inspection. This generational divide is consistent with the national-level findings of IAMAI–Kantar and Deloitte.

Second, education and locality are highly correlated with conversational-AI influence. Graduate and post-graduate respondents report PII scores well above the average, reflecting both higher digital literacy and greater comfort with text-based interaction. Urban respondents outscore rural respondents by a margin of 0.35 on the PII, which mirrors the smart-phone penetration gap, the availability of high-quality Marathi NLP support, and the relative scarcity of vernacular high-quality chatbots targeted at rural audiences.

Third, language preference emerges as a particularly important moderator that has been under-emphasised in prior literature. Respondents whose primary language is English report a PII of 0.71, while Marathi-first respondents report 0.58. The gap reflects the fact that most national e-commerce and banking chatbots default to English, and that the perceived accuracy of Marathi-language voice recognition remains a friction point. Chi-square tests confirmed that the relationships between age and PII ($\chi 2 = 58.4$, $p < 0.001$), locality and PII ($\chi 2 = 44.7$,

$p < 0.001$) and language preference and PII ($\chi 2 = 31.2$, $p < 0.001$) are statistically significant, while the gender–PII relationship was not significant at the 0.05 level.

9. Trust, Privacy and Ethical Challenges

While conversational AI has expanded the information available to consumers, it has also introduced new sources of risk and uncertainty. The survey identified five dominant concerns reported by Nashik respondents. The most frequently cited concern was the fear of conversational errors or "hallucinations" where chatbots provide factually incorrect information with high confidence (reported by 61.4 per cent of respondents), followed by data privacy concerns associated with sharing personal and financial information with AI agents (57.3 per cent), lack of transparency about whether the user is interacting with a bot or a human (46.8 per cent), difficulty in escalating to a human agent when the chatbot fails (41.6 per cent), and discomfort with the anthropomorphic tone of some assistants (24.7 per cent).

These concerns are not evenly distributed across demographic groups. Older respondents and rural respondents report significantly higher privacy concerns, which often translate into reluctance to share location data, payment information or biometric inputs even when this would unlock personalised service. Younger respondents, by contrast, report higher concerns about conversational errors and hallucinations, reflecting their greater exposure to chatbots in high-stakes contexts such as banking and healthcare. The trust deficit is also category-specific: consumers report high trust in banking virtual assistants when the bot is operated by their own bank, but significantly lower trust in third-party recommendation bots, particularly those embedded in social-media platforms.

A particularly important finding is the language barrier. Respondents whose primary language is Marathi reported that the perceived accuracy of Marathi voice recognition and the naturalness of Marathi chatbot responses significantly affect their willingness to continue using conversational-AI touch-points. While Google Assistant and Alexa have made substantial investments in Indian-language support, the quality of Marathi NLP still trails English by a measurable margin. Local WhatsApp Business bots operated by Nashik retailers, in contrast, are perceived as more natural precisely because they combine Marathi text with cultural references and contextual knowledge of the local market.

The regulatory environment is rapidly evolving. The Digital Personal Data Protection Act, 2023 [17] imposes fiduciary-grade obligations on entities that process personal data, including conversational-AI systems that collect voice, text or transactional information. The Advertising Standards Council of India has issued guidelines requiring transparent disclo-sure of AI-generated content in advertising, and the Telecom Regulatory Authority of India has initiated consultations on AI-driven telemarketing. These regulatory developments are likely to play an important role in shaping the trust envi-ronment over the coming years. The ethical dimension is equally important: designers of conversational systems must deliberately choose between transparency and persuasion, and consumers consistently report that transparent disclosure of bot identity strengthens rather than weakens trust.

10. Managerial Implications

The findings of this study carry direct implications for SMEs and marketers operating in the Nashik District. First, given the dominant position of WhatsApp Business, businesses should treat WhatsApp Business API and the WhatsApp Cloud API as foundational infrastructure. Catalogue setup, quick-reply templates, automated greeting and away messages, and basic NLP-based intent routing enable micro-segmented outreach at low cost. Integration with inventory and CRM systems creates a coherent omnichannel experience that matches the multi-touch-point journey reported by respondents.

Second, vernacular NLP is no longer optional. Nashik's Marathi-first cohort represents a substantial share of the dis-trict's consumer base, and the perceived naturalness of Marathi chatbot responses is the single strongest predictor of repeat engagement for this segment. Brands should invest in Marathi-language training data, prefer fine-tuned regional models over generic English-language models, and design conversation flows that incorporate local references and cultural con-text. The rise of open-source Marathi-language large language models after 2023 has materially reduced the cost of this investment.

Third, chatbot design should follow the principle of stage-specialisation identified in Section 6. Voice-search optimi-sation, content for Google Assistant actions, and structured data for voice answers should be prioritised for the awareness stage. Detailed FAQ content, comparison tables and review summarisation should be prioritised for the consideration stage. Discount codes, checkout assistance and abandoned-cart nudges should be prioritised for the decision stage. WhatsApp-based delivery coordination, return handling and re-engagement should be prioritised for the post-purchase stage.

Fourth, trust-building assets must be designed into the conversational-AI funnel from the outset. This includes explicit bot-identity disclosure at the start of every conversation, a prominent "talk to a human" escalation path, transparent privacy notices aligned with the DPDP Act, and routine auditing of chatbot responses for factual accuracy. For high-involvement categories such as healthcare, automobiles and real estate, chatbots should function as triage and information tools rather than as direct conversion drivers, with clear handoff protocols to human agents.

Fifth, the heterogeneity of the Nashik market requires segmentation by taluka and language preference rather than treatment as a single block. Geo-targeted chatbot deployments, taluka-specific content calendars, and parallel Marathi-and-English conversation flows can deliver materially better cost-per-acquisition metrics than undifferentiated district-level campaigns. Local festivals such as the Kumbh Mela, Makar Sankranti and the Nashik Grape Festival offer natural peaks around which chatbot campaigns can be designed. Finally, the measurement infrastructure itself should be strengthened: most local SMEs in Nashik do not currently track chatbot-specific return on investment, which makes systematic optimi-sation impossible. Investing in simple attribution dashboards that connect conversational-AI engagement to offline sales would be a high-leverage first step.

11. Findings, Discussion and Limitations

The findings of this study, viewed against the four research questions posed in Section 3, can be summarised as follows. In response to RQ1, e-commerce chatbots, banking virtual assistants and WhatsApp Business bots are the conversational-AI touch-points that most strongly shape purchase choice in Nashik. Voice-first assistants such as Google Assistant play an important but stage-specific role at the awareness stage. In response to RQ2, conversational-AI influence is highest at the consideration and decision stages for text-based chatbots and at the awareness stage for voice assistants; WhatsApp Busi-ness bots dominate the post-purchase stage. In response to RQ3, age, education, locality and language preference are the strongest demographic moderators of conversational-AI influence, while gender differences are modest and income shows a non-monotonic relationship. In response to RQ4, conversational errors, data privacy, lack of bot-identity transparency, escalation difficulty and language barriers emerge as the dominant concerns.

These findings contribute to the existing literature in three ways. First, they extend the integrated TAM3 + UTAUT2 framework to the specific case of conversational-AI adoption in a tier-2 Indian district context, showing that the broad causal chain from engagement to perceived usefulness to purchase holds but with touch-point weights that differ materially from metropolitan samples. Second, they document the stage-specialisation of conversational-AI influence, providing an empirical basis for integrated multi-touch-point strategies. Third, they

quantify the language-preference gap and link it to specific demographic segments, providing an empirical basis for targeted vernacular-NLP investments.

The study has several limitations. First, the sample is confined to the Nashik District and the results should not be uncritically generalised to other tier-2 districts. Second, the survey is cross-sectional and captures self-reported perceptions at a single point in time; actual chatbot interaction behaviour may diverge from stated intent. Third, the questionnaire, although pre-tested, is subject to social-desirability bias and recall bias, particularly for interactions that occurred several months prior. Fourth, the study does not include platform-side log data such as chatbot session length, drop-off rates or actual conversion funnels, which would provide a more granular behavioural layer. Fifth, the rapid pace of generative-AI evolution means that touch-points available at the time of the survey (January–March 2025) may be supplemented or displaced by newer interfaces within 12–18 months.

Future research can extend this work in several directions. A longitudinal study tracking the same respondents over 12–24 months would capture behavioural change more reliably. Comparative studies across multiple tier-2 districts in Maharashtra and adjacent states would help isolate district-specific effects from regional ones. Integration of platform-side behavioural data with survey-based perception data would significantly strengthen causal inference. Qualitative studies examining the role of family decision-making units in chatbot-influenced purchases would add depth to the demographic findings. Finally, as generative-AI-driven conversational agents become ubiquitous, repeat studies would be valuable to track how consumer trust perceptions shift in response to the new capability set, and how regulatory instruments such as the DPDP Act shape platform behaviour.

12. Conclusion

Conversational AI has moved from the periphery to the centre of consumer decision-making in the Nashik District, but its influence is unevenly distributed across touch-points, demographic groups, purchase stages and product categories. E-commerce chatbots, banking virtual assistants and WhatsApp Business bots dominate the direct purchase-influence channel, while voice assistants such as Google Assistant play a critical but stage-specific role at the awareness stage. The findings confirm that conversational-AI influence is strongest among younger, educated, urban, English-preferred consumers and weakest among older and rural respondents, although the gap is narrowing as vernacular NLP and smart-phone access expand. Trust-related concerns, particularly around conversational errors, privacy and bot-identity transparency, represent structural constraints on the further growth of conversational commerce in the district.

The managerial implication is that a single-chatbot strategy is unlikely to succeed in Nashik. Effective strategies will combine WhatsApp Business integration, vernacular Marathi NLP, voice-search optimisation, transparent bot-identity dis-closure and taluka-level segmentation. For marketers, researchers and policy makers interested in tier-2 Indian markets, Nashik offers a microcosm of the opportunities and challenges that will define the next phase of conversational-AI-driven consumption growth in India. The pathway forward lies in treating chatbots and virtual assistants not as stand-alone tech-nologies but as integrated layers woven into the broader consumer journey, supported by trust-building investments that match the district's cultural and linguistic texture.

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