Understanding the Role of Trust and Usefulness in Consumer Motivations for AI-enabled Voice Assistants in E-Commerce: A Structural Equation Modelling Approach

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ABSTRACT

The rapidly growing adoption of Artificial Intelligence-enabled voice assistants across Indian markets creates a necessity to understand consumer behavioural patterns driving purchase intentions in e-commerce. Despite widespread usage, limited study exists on how motivational elements influence consumer trust and perceived usefulness of voice assistants in Indian online shopping. Drawing on the Motivated Consumer Innovativeness framework and Stimulus-Organism-Response model, this study examines how functional, hedonic, social, and cognitive motivations affect purchase intentions through trust and perceived usefulness as parallel mediators. Using purposive sampling, data were collected from 385 Amazon Alexa users in Telangana, India, via structured questionnaires employing 7-point Likert scales, and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with 10,000 bootstrap subsamples. Results indicate that functional motivators significantly enhance both perceived usefulness and trust, while social motivators increase usefulness and cognitive motivators strengthen trust. Notably, hedonic motivators do not significantly predict trust, and cognitive motivators demonstrate only a marginal association with usefulness. Both trust and perceived usefulness significantly mediate the relationship between consumer innovativeness and purchase intention, with trust exerting the strongest direct influence on purchase behaviour. The findings demonstrate that functional motivators outweigh hedonic and social influences in driving consumer adoption, suggesting that AI-enabled voice assistant services should prioritise practical utility, competence signalling, and reliability

features over entertainment-oriented functionalities. These insights provide valuable guidance for e-commerce platforms and AI developers in designing user-centric voice assistant interfaces that enhance consumer trust and drive purchase behaviours in diverse Indian markets.

INTRODUCTION

Artificial intelligence (AI) enabled voice assistants (VAs) are reshaping e-commerce by delivering personalised recommendations, simplifying search processes, and enabling natural conversational interactions. Devices such as Amazon Alexa and Google Home have rapidly penetrated Indian markets, with Alexa alone reaching most parts of the country's pin codes and reporting a 200% increase in smart device connectivity in the last three years. Their intuitive design and efficiency have enhanced customer engagement and satisfaction (McLean & Osei-Frimpong, 2019; Moriuchi, 2019), and global studies confirm that convenience, ease of use, and ability to process complex instructions drive adoption and loyalty (Kowalczuk, 2018; Matosas-López, 2024; Rhee & Choi, 2020).

Despite this widespread adoption, significant gaps remain. The Motivated Consumer Innovativeness (MCI) framework (Vandecasteele & Geuens, 2010), which explains adoption behaviour across functional, hedonic, social, and cognitive dimensions, has been underutilised in studies of VAs. While research has linked innovativeness to the adoption of AI tools in retail, fashion, and hospitality (Arachchi & Samarasinghe, 2023; Cai et al., 2022; Ylilehto et al., 2021), little is known about

how these motivations shape purchase intentions in Indian online shopping contexts.

Recent research has examined the multi-faceted nature of adopting a voice assistant in different cultures. Studies from around the world have shown that the convenience of using a voice assistant is one of the main reasons people use them. (Kowalczuk, 2018; Rhee & Choi, 2020). However, depending on how much perceived value, personal innovativeness, and user experience influence their level of intent to purchase a voice assistant, some users may have different levels of intent to purchase compared to others (Pal et al., 2023). In addition to being a multi-disciplinary area of research, researchers need theoretical frameworks that consider both the different types of technologies used with voice assistants as well as how voice assistants are culturally embedded in people's homes (Patrizi et al., 2023). In emerging markets like Jordan, patterns of acceptance show that users continue to use voice assistants for reasons of performance expectancy and effort expectancy; however, other contextual factors also influence how people adopt voice assistants (Al-Fraihat et al., 2023), suggesting that Indian consumer behaviour may exhibit similar contextual nuances.

Trust further complicates this picture. It has long been recognised as a prerequisite for satisfaction and purchase behaviour in online environments (Lu et al., 2015), extending to AI-based systems where it reduces risk and strengthens adoption (Alalwan et al., 2018; Chopdar et al., 2018). In India, especially, trust often precedes perceptions of utility, emphasising its mediating role in the relationship between innovativeness and purchase intention (Sarkar et al., 2020). Prior research highlights AI's influence on innovation, trust, utility, and purchase outcomes. However, few studies have integrated these elements within a combined MCI–S-O-R framework in the VA context. Table 1 shows the key studies on consumer motivation for ai voice assistants.

This study addresses these gaps by examining how AI-enabled VAs influence online purchase behaviour through functional, hedonic, social, and cognitive motivations. Using the Stimulus–Organism–Response (S-O-R) framework, it explores how these motivations shape consumer perceptions of usefulness and trust, which in turn affect purchase intentions. By doing so, the research advances understanding of consumer innovativeness in AI-enabled commerce. It provides actionable insights for e-commerce platforms and developers seeking to build trustworthy, user-centric voice interfaces for diverse Indian markets. It leads to the following questions:

RQ1: How do functional, hedonic, social, and cognitive dimensions of MCI influence perceived usefulness and trust in AI-VAs?

RQ2: Do perceived usefulness and trust mediate the relationship between MCI dimensions and purchase intention?

RQ3: Which MCI dimensions exert the strongest influence in the Indian e-commerce context?

LITERATURE REVIEW

The complexity of voice assistant interactions, which involves functional utility along with social and emotional aspects, requires a multidimensional approach to analyse the motivations of consumers. Unlike other digital technologies, voice assistants involve natural language processing, personalisation, and interaction, which makes them more complex and go beyond functionality into social and emotional spaces (McLean & Osei-Frimpong, 2019; Moriuchi, 2019). The importance of understanding the adoption trends of voice assistants not only in the global market but also in culturally diverse countries like India, where digital adoption trends are influenced by socio-cultural values and distinct consumer trust patterns, cannot be overstated (Chopra, 2019). Since India is one of the fastest-growing e-commerce markets with an increasing presence of Amazon Alexa and Google Assistant, analysing the role of motivational factors in influencing usefulness, trust, and purchase intentions is a pressing research issue.

Scholars used the MCI (Motivated Consumer Innovativeness) framework proposed by Vandecasteele and Geuens (2010) to understand how consumer

Table 1

Key studies on consumer motivation for ai voice assistants

Authors	AI Technology	Variables	Context of the Study	Key Findings
Ylilehto et al. (2021)	AI in Retailing	Convenience, enjoyment, social interaction, shopping channel choice	AI in retail shopping	Convenience, enjoyment, and social interaction influence AI shopping
R. Singh (2021)	Voice Assistants (Anthropomorphism)	Anthropomorphism, self-disclosure, attachment, satisfaction, repurchase intention	Repurchase via anthropomorphism	Anthropomorphism and self-disclosure foster attachment and repurchase
Arachchi & Samarasinghe (2023)	AI-enabled Voice & Smart Speech Recognition	Perceived usefulness, enjoyment, consumer innovativeness, purchase intention	Fashion retail adoption	Usefulness, enjoyment, and innovativeness predict purchase intention
Cai et al. (2022)	AI-enabled Voice Assistants in Hotels	Brand, perceived usefulness, ease of use, anthropomorphism, WOM, privacy concern	Hospitality guest experience	Branded VAs boost usefulness, anthropomorphism, and trust
A. Liu et al. (2023)	Assistive AI for Visually Impaired Consumers	Accessibility, supportive design, inclusion, consumer experience	Accessibility for visually impaired	AI improves accessibility but inclusivity gaps remain
Chopra (2019)	Voice Assistants, Chatbots, AR	Expectancy (ease), instrumentality (competence), valence (trust, satisfaction)	Indian retail motivations	Ease, competence, and trust motivate Indian AI adoption
Jang et al. (2023)	Smart Speaker Voice Shopping	Anthropomorphism, satisfaction, intention to adopt voice shopping	Smart speaker shopping adoption	Anthropomorphism enhances satisfaction and adoption of voice shopping
Mari et al. (2024)	AI Empathy & Voice Assistants	Functional, relational, socio-emotional stimuli, trust, usefulness, task delegation	AI empathy and trust	Functional and emotional stimuli drive trust and usefulness

Table 1 (*continued*)

Authors	AI Technology	Variables	Context of the Study	Key Findings
Kautish et al. (2023)	Voice Assistants in E-commerce	Functional, hedonic, social, cognitive motivations, trust, usefulness, purchase intention	SOR in online shopping	Functional, social, and hedonic motives shape purchase intention
Fernandes & Oliveira (2020)	Digital Automated Services	Ease of use, usefulness, trust in digital services	Trust in digital services	Ease and usefulness are key trust drivers in digital services
Huang et al. (2024)	Voice Personal Assistants (Competence/Trust)	Competence-based trust, functional attributes, adoption	Competence-based trust in VAs	Functional traits build competence-based trust in VAs.
McLean & Osei-Frimpong (2019)	Voice Assistants in Home/E-commerce	Trust, empathy, anthropomorphism, continued VA usage	In-home VA adoption	Trust and empathy from anthropomorphism enhance VA use
Pitardi & Marriott (2021)	Voice Assistants in Online Shopping	Enjoyment, innovativeness, trust, favorable attitudes	Hedonic trust drivers	Enjoyment influences trust more strongly than functionality
Choudhary et al. (2024)	AI-enabled Voice Assistants (Social Motivation)	Social image, differentiation, adoption of AI tools	Social image and AI use	AI adoption linked to social image and self-differentiation
Mariani et al. (2023)	AI-enabled Voice Assistants (Social Agency)	Anthropomorphism, humanness, social presence, trust, long-term adoption	Trust via social presence	Social presence fosters trust and long-term VA adoption

innovativeness is multidimensional. Vandeaseele and Geuens (2010), within their MCI framework described four dimensions of innovativeness: Functional (practical, efficient), Hedonic (fun, enjoyable), Social (socially accepted, socially desirable), Cognitive (intellectually curious, engaged in learning & discovery) (Bartels & Reinders, 2011; Hwang et al., 2021). An example of early (pre-2000) technology adoption, research conceptualised innovativeness as a general individual difference of personality (general innovativeness), while MCI reconceptualises the act of adopting technology as being goal-directed/ context specific (Vandecasteele & Geuens, 2010.). That is, MCI provides an alternative view of innovativeness than that which assumes that consumers seek novelty and innovativeness in the same way across all categories. Instead, MCI concludes that consumers adopt innovative technologies to fulfil different types of motivational goals; whether to maximise efficiency

via functional means, obtain emotional satisfaction through hedonic means, achieve social approval through social means, or stimulate intellect through cognitive means. Pal et al. (2023) found support through empirical evidence for the moderating effect of individual innovativeness on the relationship between perceived value and usage intention, with this relationship varying according to utilitarian vs. hedonic value perceptions of the created product. Therefore, MCI provides a more nuanced theoretical lens than general innovativeness by explicitly linking motivational states to specific technology attributes, making it particularly appropriate for examining AI-enabled voice assistants where adoption decisions involve both rational utility calculations and experiential engagement.

Recent developments in complexity theory indicate that the adoption of smart voice assistants for shopping purposes is a dynamic system where functional, hedonic, and social motivations interact in a non-linear fashion to influence consumer choice (Al-Fraihat et al., 2023). The complexity theory view is consistent with the MCI framework and indicates that adoption is more than the simple sum of individual motivational components, but rather the result of their configuration within the decision environment of the consumer. Trust calibration in voice assistants also goes beyond the general trust in the platform and includes assessments of skill competence, where the speech patterns of the user indicate their implicit level of trust, which in turn influences continued use intentions (Gauder et al., 2023).

The S-O-R Model of Mehrabian and Russell (1974) helps make everyday purchases understandable by demonstrating how customer motivation leads to purchase intention and ultimately to purchase decisions. Motivation is viewed as the "stimulus", while the internal evaluation of usefulness and trust are "organismic state". Lastly, consumer purchase intention is considered a "response" to technology-based product motivation. This relationship between motivation (stimuli), internal evaluation of usefulness and trust (organismic state) and purchasing intention as a response has been examined many times regarding high-technology products. The findings indicate that functional (task-related), relational (social) and socio-emotional (empathy) stimuli can lead to consumer purchase intention through the relationship of consumer trust and perceived usefulness (Kautish et al., 2023; Lee et al., 2011; Mari et al., 2024). Humanised (anthropomorphised) and empathetic stimuli such as customers using AI-enabled tools are also seen to influence organismic states (e.g., trust) to influence responses (e.g., task delegation; electronic word of mouth) (Mari et al., 2024). Therefore, the S-O-R model is relevant to research investigating AI-based voice assistants by evaluating MCI dimensions as stimuli, evaluations (perceived usefulness and trust) as organism states, and purchase intentions as behavioural responses.

In this S-O-R model, perceived usefulness and trust play a vital role as mediators. Perceived usefulness, derived

from the Technology Acceptance Model (Davis, 1989), is one of the most reliable predictors of adoption in the online context. It has been found that when VAs is able to deliver timely and efficient responses, consumers experience higher levels of usefulness, which in turn increases purchase intentions (Akhter et al., 2022; Šalčiuvienė et al., 2024; Willman-Iivarinen, 2017). Recent research has also revealed that usefulness generated from functional, hedonic, and cognitive perspectives has a significant impact on online shopping intentions (Kautish et al., 2023; C. Singh et al., 2024).

Functional innovativeness represents a desire to increase operational efficiencies and efficiencies (Bartels & Reinders, 2011). Consumers adopting technological solutions with functional goals (i.e., voice assistants) will evaluate the technology from predominantly utilitarian (i.e., task completion speed and accuracy) perspectives (Davis, 1989). This provides consumers with a direct cognitive pathway to assess the perceived usefulness of the system, in that the level of the effectively designed system provides an increase in job performance (Davis 1989). Within e-commerce environments, functional motivators support the complex - theoretical perspective that consumers will use a voice shopping technology when the technology allows them to reduce their decision-making complexity and increases the efficiency of their shopping experiences (Al-Fraihat et al., 2023). Therefore:

H1a: The functional dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of usefulness when shopping online.

Social innovativeness is driven by the need for social approval and self-enhancement because of technology ownership (Vandecasteele & Geuens, 2010). In collectivist settings, such as in India, social motivations may counterintuitively play a role in perceived usefulness rather than trust, where the ownership and display of innovative technologies are functional to status signalling and identity construction. The "usefulness" of the voice assistant goes beyond task optimisation to include its use as a social signalling tool, to signal modernity, technological advancement, and social status (Choudhary et al., 2024). Hence, social motivations increase perceived usefulness by broadening the construct of "usefulness" to include its role in social impression management within the consumer's social network. Hence:

H1c: The social dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of usefulness when shopping online.

On the other hand, the concept of Hedonic Innovativeness is based on the enjoyment, fun (play), and emotionality involved in an experience (Bartels & Reinders, 2011). Hedonic motivation can cause one to adopt a product or service due

simply to its entertainment value; however, its potential for influencing the perception of usefulness from a task-oriented perspective is much lessened by the degree to which a consumer has been motivated by pleasure versus by utilitarian purposes. But to the extent that Hedonic features enhance consumers' participation, exploration, and discovery will still, through that increase in engagement display some contribution to the perceived usefulness of these objects. Therefore:

H1b: The hedonic dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of usefulness when shopping online.

Cognitive innovativeness represents intellectual curiosity and the need for new experiences (Vandecasteele & Geuens, 2010). Although cognitive engagement leads to systematic processing of system capabilities, consumers who are high in cognitive motivation examine the information accuracy, learning capabilities, and consistency of the VA, which could improve perceptions of the system's practical utility and competence for tasks. Therefore:

H1d: The cognitive dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of usefulness when shopping online.

Trust is an important condition of organisms that reduces the perceived risk and provides confidence in decision made by AI in the context of e-commerce (Lu et al. 2015; Mari & Algesheimer., 2021). The creation of trust is multidimensional; there are two forms of trust based on competence is developed from functional characteristics (e.g., easy to use, reliable) (Fernandes & Oliveira, 2020; Huang et al.,2024) and trust based on integrity have developed through social perceptions of the technologies that can create anthropomorphic responses, empathy and emotional engagement (Foehr & Germelmann, 2019; Mariani et al., 2023; McLean & Osei-Frimpong, 2019). More specifically, functional reasons use competence-based trust through communicating reliability/ability to complete the task of the system. When customers adopt a Voice Assistant (VA) for functional purposes they will evaluate the performance of the system as a tool and use that to strongly build their trust in the competence/reliability of the VA. Therefore:

H2a: The functional dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of trust when shopping online.

However, cognitive innovativeness leads to systematic processing of system competence and reliability cues. In high-uncertainty environments like AI-mediated transactions, consumers with high cognitive motivation evaluate the information accuracy, learning abilities, and consistency of the VA, which are direct cues of competence-based trustworthiness (Foehr & Germelmann, 2019). Moreover, recent

studies have shown that users' trust in voice assistant skills is inferred from interaction patterns that indicate cognitive evaluation of system abilities (Gauder et al., 2023), which suggests that cognitive motivations lead to evaluation of system integrity and competence, resulting in trust. Therefore:

H2d: The cognitive dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of trust when shopping online.

Current research highlights that trust building in voice-based artificial intelligence situations depends upon anthropomorphic cues and brand personification. When consumers seek hedonic satisfaction from voice assistants, they give human-like characteristics and social presence to them. This anthropomorphism creates emotional attachments to the technology resulting in forming trust through emotional attachment rather than through rationally based assessments (Jang et al., 2023; Pitardi & Marriott, 2021). Brands that use anthropomorphism enhance trust creation via a humanised experience with consumers thus increasing their willingness to use technology to assist them in making purchase decisions. Therefore, individuals' enjoyment and feeling as though they have a social presence facilitate building confidence in the voice assistant's recommendation through affective-based pathways. Hence:

H2b: The hedonic dimension of consumer innovativeness regarding

AI voice assistants is predicted to favourably influence perceptions of trust when shopping online.

Similarly, social innovativeness entails social identity enhancement and self-presentation (Choudhary et al., 2024). Consumers driven by social approval may build trust through social rapport and the social presence of the VA, as anthropomorphic characteristics create a sense of social interaction that boosts trust in the technology (Mariani et al., 2023). Long-term consumer reliance on VAs has been linked to social rapport and trust, proving the importance of anthropomorphic and social characteristics in building long-term user relationships (Ling et al., 2020; R. Singh, 2021). Hence:

H2c: The social dimension of consumer innovativeness regarding AI voice assistants is predicted to favourably influence perceptions of trust when shopping online.

Turning to the response variable, purchase intention is the behavioural consequence of the organismic states. Both perceived usefulness and trust are hypothesised to have a direct effect on this outcome. Perceived usefulness has been shown to be a consistent predictor of adoption in digital spaces, and consumers who perceive the usefulness of VA technology are likely to convert this perception into purchase intention (Davis, 1989). Hence:

H3: The perceived usefulness of AI voice assistant technology is expected

to have a significant positive effect on consumers' intentions to make online purchases.

In addition, trust can decrease perceived risk when consumers are engaged in online transactions and have a positive impact on their intention to adopt the technology (Alalwan et al, 2018; Chopdar et al, 2018). In India, trust is commonly the emotion that leads to a positive perception of a product's benefit; therefore, trust is very important in making purchasing decisions (Sarkar et al., 2020). So:

H4: The perceived trust in AI voice assistant technology is expected to have a significant positive effect on consumers' intentions to make online purchases.

Ultimately, within an integrated S-O-R framework, the mediating roles of Useful and Trust resolve Motivational Stimuli into Behavioural Responses. The complexity of VA adoption indicates that MCI dimensions will indirectly influence Purchase Intention by means of the psychological mechanisms (Kautish et al., 2023). Functional motivations are anticipated to have substantial indirect effects on Purchase Intention through both Perceived utility (alignment of utilitarian value) and Trust (signalling competence). Therefore:

H5a: The impact of functional motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of usefulness.

H6a: The impact of functional motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of trust.

Hedonic motivations, although possibly weaker direct predictors, may affect purchase intention indirectly via affective trust development (through anthropomorphism) and possibly via usefulness (if enjoyment increases engagement). Therefore:

H5b: The impact of hedonic motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of usefulness.

H6b: The impact of hedonic motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of trust.

Social motivations may affect purchase intention indirectly via usefulness (status signalling as functional benefit) and possibly via trust (social presence and anthropomorphism). Therefore:

H5c: The impact of social motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of usefulness.

H6c: The impact of social motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of trust.

Cognitive motivations are expected to influence purchase intention primarily through trust (competence-based trust formation) and potentially through usefulness (task efficiency perceptions). Thus:

H5d: The impact of cognitive motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of usefulness.

H6d: The impact of cognitive motivations for consumer innovativeness regarding AI voice assistants on online purchase intentions is expected to be significantly mediated through perceptions of trust.

This study expands previous works by investigating the role of consumer innovativeness, trust, and purchase intention in the context of Indian e-commerce voice assistants (e.g., Cai et al., 2022; S. Liu et al., 2023). Research on the relationship between consumer innovativeness, trust, and purchase intention has been conducted across several industries (e.g., hospitality, retail, fashion, grocery store), but the VA context for Indian e-commerce is relatively underexplored. Additionally, most existing

literature examines either trust (e.g., Mari & Algesheimer, 2021) or usefulness (e.g., C. Singh et al., 2024) as mediators of purchase intention in isolation, as opposed to integrating both mediators into an MCI-SOR framework. As such, there is limited understanding of how motivational factors translate into purchase intention through the psychological component of consumer behaviour. Overall, the literature reveals that the motivation of consumers is essential to their use of AI-enabled voice assistants, that usefulness and trust are key mediators of purchase intention, and that the SOR framework provides an adequate representation of how motivation translates into purchase intention. Notwithstanding, there are still some research gaps about the combined effects of functional, hedonic, social, and cognitive innovativeness on perceived usefulness and trust. Therefore, this research paper seeks to examine the effects of the four components of motivated consumer innovativeness, namely functional, hedonic, social, and cognitive innovativeness, on purchase intentions, with a special emphasis on the mediating effects of perceived usefulness and trust in the context of AI-powered voice assistants in the Indian online shopping market. Figure 1 shows the concept model.

METHODOLOGY

The study adopted a systematic approach to investigate the hypothesised relationships between motivated consumer innovativeness dimensions, mediating variables, and purchase intentions. A structured
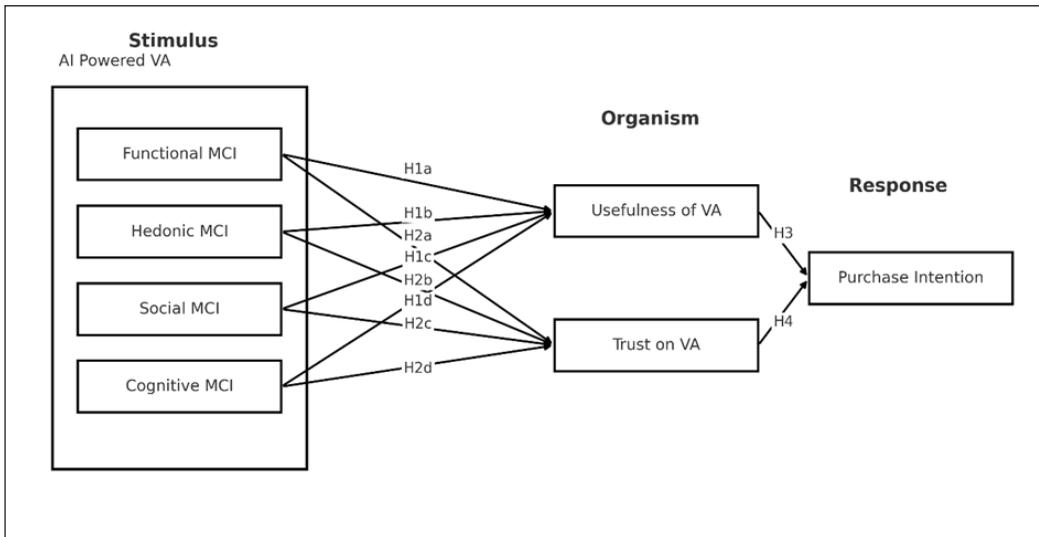
Figure 1. Conceptual Model

questionnaire was developed using Google Forms and distributed digitally. Seven constructs were measured on a 7-point Likert scale. Established measurement scales guided the questionnaire design: seven items each for functional and hedonic motivators and five items each for social and cognitive motivators, adapted from Vandecasteele and Geuens (2010). Perceived usefulness was measured with five items from Abdullah et al. (2016), trust was assessed using four items from Komiak and Benbasat (2006), and purchase intention was measured with four items adapted from Chopra (2019). Prior to main data collection, the instruments underwent pilot testing (n=30) to ensure contextual appropriateness for Indian Alexa users, resulting in minor item rephrasing for clarity.

The participants of this study are a select group of participants that have previously used AI-powered vocal assistants, and

they are specifically Amazon Alexa users located in Telangana, India, who speak the English language and experienced in how to use devices with AI-powered voice assistants. The researcher will use purposive sampling because the goal is to gather data from individuals that are classified as early adopters, who use a voice assistant regularly as there is a large tech industry, and numerous smart devices, in Hyderabad, Telangana. Purposeful sampling was the only viable sampling option for this research because the researcher does not have many resources and all participants needed to use English notes to use the responses from participants after completion of data collection. (Campbell, 2007). Using purposeful sampling ensures that the researcher collected high-quality data from qualified participants but will limit the findings of this research to participants not from other nations or from other states

in India. There are, however, sufficient differences among respondents based on age, income, and education to indicate substantial diversity in the characteristics of respondents (Table 2), despite the position of the genders noted as being 61.5% male (which is consistent with other studies that noted some possible gender biases in the early adopters of technology). Future studies should attempt to use stratified random sampling to include a representative diversity of educational and socio-economic groups across other states to help increase the external validity of this study.

This study adhered to the ethical guidelines for research involving human participants as outlined by the Declaration of Helsinki and institutional research standards for non-invasive consumer surveys. Although formal IRB approval was not required for this observational, survey-based research involving minimal risk, stringent ethical protocols were implemented throughout. Prior to accessing the questionnaire, participants were presented with a digital informed consent statement detailing the study's purpose, voluntary nature, and estimated completion time; consent was indicated by clicking "I agree to participate" before proceeding. To ensure anonymity, no personally identifiable information (names, addresses, or contact details) was collected. Participation was entirely voluntary with no compensation provided, and respondents could withdraw at any time without penalty, ensuring the study posed no physical, psychological, or financial risk to participants. Potential

respondents were screened through known networks to confirm Alexa usage and language compatibility before receiving the survey link. The questionnaire was sent to approximately 800 participants, yielding 520 responses (a 65% response rate). After data validation and cleaning to ensure reliability and completeness, 385 valid responses were retained. This sample size is consistent with Cochran's guidelines for maintaining 80% statistical power at a 5% significance level, ensuring adequacy for structural equation modelling. Data were collected over four months from March to June 2024.

SmartPLS software was used to conduct data analysis with Partial Least Squares - Structural Equation Modeling (PLS-SEM). The consideration of methodology for this analysis began with whether it should use PLS-SEM or covariance-based SEM (CB-SEM). Given the research question's focus on predictive rather than confirmatory research, PLS-SEM allows for the maximum amount of variance explained in endogenous constructs (R^2) as opposed to reproducing an established theoretical covariance matrix (J. Hair & Alamer, 2022). Thus, since the current study will predict purchase intention using multiple mediators (i.e., trust and usefulness) instead of testing a pre-existing theoretical structure, and in keeping with the exploratory nature of evaluating MCI Dimensions within the Indian VA context, PLS-SEM was used throughout this analysis.

Second, as a variance-based and non-parametric method, PLS-SEM outperforms

CB-SEM in dealing with non-normal distributions and smaller sample sizes; with 385 participants and 7 constructs, the sample size satisfies the "10-times rule" (10 observations per predictor) but is close to the lower threshold for CB-SEM (Henseler et al., 2014). Third, the measurement model consists of reflective constructs (trust, usefulness) and formative indicator-compatible constructs (MCI dimensions as separate motivational forces), which are better handled by PLS-SEM than CB-SEM, assuming a purely reflective measurement model. Finally, due to the complexity of the parallel mediation model, the bootstrapping facilities of PLS-SEM are better suited for robust standard error estimation of indirect effects in the mediation model than CB-SEM, which requires strict multivariate normality.

Common Method Bias

Common Method Bias (CMB) was assessed using a multi-method approach incorporating procedural remedies and statistical diagnostics. Procedurally, respondent anonymity was guaranteed, item order was randomised within constructs and validated multi-item scales were used. Statistically, Harman's single-factor test indicated the largest factor explained only 18.27% of variance (below the 50% threshold). The marker variable technique (using "preference for traditional shopping") showed an average correlation of 0.042 with substantive constructs; partialling out this marker left all significant relationships unchanged. Full collinearity VIFs ranged from 1.206 to 1.850, well below Kock's (2015) 3.3 threshold. Additionally, a latent CMB factor analysis revealed that method variance accounted for less than 1% of shared variance (ratio = 91.75:1), collectively confirming that CMB does not threaten the study's validity.

RESULTS

According to this demographic profile (Table 2), the study appears to have a representative and varied sample of the Indian population using AI-based voice assistants.

Table 2
Demographic profile of respondents

	Frequency	Percentage
Gender		
Female	148	38.50%
Male	237	61.50%
Age		
18Y - 25Y	106	27.50%
26Y - 35Y	164	42.60%
36Y - 45Y	70	18.20%
Above 45Y	45	11.70%

Table 2 (*continued*)

	Frequency	**Percentage**
Education		
Graduation	146	37.90%
Post-graduation	216	56.10%
PhD	23	6.00%
Annual Income		
Up to 5 lakhs	147	38.20%
Above 5L - 8L	165	42.80%
Above 8L - 15L	50	13.00%
Above 15L - 20L	10	3.00%
Above 20L	13	3.40%
Experience in using AI-based VA		
1year	195	50.60%
2years & above	190	49.40%

Structural Model Assessment

Factor loading all the items used in the model, Cronbach's alpha of all the constructs, rhoA, CR (composite reliability), and AVE (Average Variance Extracted) of all the variables are some of the essential metrics shown in the Table 3 that are used to evaluate the validity and reliability of constructs (J. F. Hair et al., 2012). The values of 0.9 and above for factor loading and RhoA demonstrate the validity and reliability of the constructs used in the study. Finally, the AVE (average variance extracted) values have shown higher than the threshold value of 0.6 and indicate strong convergent Validity as presented in Table 4.

All correlations fell below the critical threshold value of 0.85 (Henseler et al., 2014), indicating that the constructs in this study maintain strong discriminant validity, according to the HTMT ratio analysis. Purchase intention (0.624) and trust in AI VA (0.54) exhibit moderate to high correlations with the cognitive motivators of AI VA, indicating a connection between these categories while also suggesting they remain distinct. Hedonic motivators and functional motivators of AI VA have the strongest correlations (0.625 and 0.599, respectively), indicating a close but different relationship. There are also moderate correlations with purchase intention (0.599) and trust in AI VA (0.525). Additionally, the Hedonic motivators of AI VA show a moderate degree of association with both purchase intention (0.459) and functional motivators (0.625), indicating discriminant solid validity. Ample discriminant validity is confirmed by the moderate to high correlations that purchase intention itself exhibit with cognitive motivators (0.624), functional motivators (0.599), and trust in AI VA (0.63), all of which are below the threshold. The moderate correlations between the social motivators of AI VA and purchase intention (0.555) and trust in AI

Table 3
Reliability and validity of the constructs

Construct	Coding	Factor Loading	Cronbach's Alpha	rhoA	Composite Reliability	Average Variance Extracted
Cognitive Motivators	AI C M 1	0.91	0.943	0.944	0.956	0.814
	AI C M 2	0.89				
	AI C M 3	0.892				
	AI C M 4	0.904				
	AI C M 5	0.915				
Functional Motivators	AI F M 1	0.836	0.900	0.901	0.920	0.624
	AI F M 2	0.828				
	AI F M 3	0.812				
	AI F M 4	0.828				
	AI F M 5	0.823				
	AI F M 6	0.725				
	AI F M 7	0.657				
Hedonic Motivators	AI H M 1	0.871	0.906	0.906	0.926	0.643
	AI H M 2	0.629				
	AI H M 3	0.831				
	AI H M 4	0.817				
	AI H M 5	0.819				
	AI H M 6	0.844				
	AI H M 7	0.78				
Social Motivators	AI S M 1	0.863	0.923	0.927	0.942	0.763
	AI S M 2	0.883				
	AI S M 3	0.87				
	AI S M 4	0.885				
	AI S M 5	0.867				
Purchase Intention	PI 1	0.929	0.935	0.936	0.954	0.837
	PI 2	0.907				
	PI 3	0.922				
	PI 4	0.901				
Trust on AI-based VA	T AI VA 1	0.917	0.928	0.930	0.949	0.823
	T AI VA 2	0.93				
	T AI VA 3	0.898				
	T AI VA 4	0.883				
Usefulness of AI-based VA	U AI VA 1	0.811	0.934	0.935	0.950	0.794

Table 3 (*continued*)

Construct	Coding	Factor Loading	Cronbach's Alpha	rhoA	Composite Reliability	Average Variance Extracted
	U AI VA 2	0.919				
	U AI VA 3	0.917				
	U AI VA 4	0.926				
	U AI VA 5	0.876				

Table 4
Discriminant validity

	CM AIVA	FM AI VA	HM AI VA	PI	SM AI VA	Trust	Usefulness
CM AIVA							
FM AI VA	0.578						
HM AI VA	0.465	0.625					
PI	0.624	0.599	0.459				
SM AI VA	0.492	0.477	0.407	0.555			
Trust	0.54	0.525	0.393	0.630	0.405		
Usefulness	0.398	0.498	0.352	0.48	0.419	0.443	

Note. CM AI VA: Cognitive Motivators, FM AI VA: Functional Motivators, HM AI VA: Hedonic Motivators, SM AI VA: Social Motivators, PI: Purchaser Intention)

VA (0.405) highlight their uniqueness. The most substantial connection between trust and purchase intention (0.63) is found in AI VA, but it is still below the threshold value, indicating adequate discriminant validity. Lastly, the usefulness of AI VA exhibits modest correlations; its discriminant Validity is confirmed by the strongest correlation, 0.498, with Functional Motivators, which is substantially within allowable bounds.

Based on data presented in Table 5 and Table 6, functional Motivators (β = 0.282, p < 0.001, supporting H1a) and social motivators (β = 0.202, p = 0.002, supporting H1c) are positively significant in predicting the usefulness of AI-based voice assistants, explaining 26.2% of the variance. Cognitive motivators show marginal significance (β = 0.113, p = 0.057), while hedonic motivators are not significant (β = 0.041, p = 0.541). For trust (R^2 = 0.327), functional motivators (β = 0.248, p = 0.007, supporting H2a) and cognitive motivators (β = 0.330, p < 0.001, supporting H2d) are significant. Social motivators show marginal significance (β = 0.132, p = 0.057), while hedonic motivators are not significant (β = 0.067, p = 0.426), failing to support H2b. Furthermore, both usefulness (β = 0.272, p < 0.001, supporting H3) and trust (β = 0.473, p < 0.001, supporting H4) significantly predict purchase intention, explaining 39.6% of the variance.

Table 5
Structural model assessment

Hypothesis	Path	β	t-value	95% CI	p-value	Supported	f²	VIF	R²
H1a	Functional → usefulness	0.282	3.936	[0.139, 0.420]	0	Yes	0.062	1.85	0.262
H1b	Hedonic → usefulness	0.041	0.613	[-0.087, 0.172]	0.541	No	0.001	1.545	
H1c	Social → usefulness	0.202	3.104	[0.075, 0.328]	0.002	Yes	0.037	1.389	
H1d	Cognitive → usefulness	0.113	1.907	[0.001, 0.231]	0.057	No*	0.012	1.605	
H2a	Functional → Trust	0.248	2.706	[0.071, 0.428]	0.007	Yes	0.043	1.85	0.327
H2b	Hedonic → Trust	0.067	0.798	[-0.101, 0.230]	0.426	No	0.003	1.545	
H2c	Social → Trust	0.132	1.906	[-0.002, 0.270]	0.057	No*	0.014	1.389	
H2d	Cognitive → Trust	0.33	4.783	[0.194, 0.462]	0	Yes	0.092	1.605	
H3	Usefulness → purchase Intention	0.272	4.664	[0.159, 0.387]	0	Yes	0.085	1.206	0.396
H4	Trust → Purchase intention	0.473	9.141	[0.371, 0.572]	0	Yes	0.319	1.214	

Table 6
Mediation effect

Hypothesis	Indirect path	Indirect Effect (β)	t-value	95% Confidence Onterval	p-value	Supported
H5a	Functional → Usefulness → Purchase intention	0.077	2.967	[0.032, 0.134]	0.003	Yes
H5b	Hedonic → Usefulness → Purchase intention	0.011	0.591	[-0.025, 0.050]	0.555	No
H5c	Social → Usefulness → Purchase intention	0.055	2.530	[0.018, 0.103]	0.012	Yes
H5d	Cognitive → Usefulness → Purchase intention	0.031	1.729	[0.000, 0.070]	0.085	No*
H6a	Functional → Trust → Purchase intention	0.117	2.592	[0.033, 0.211]	0.01	Yes
H6b	Hedonic → Trust → Purchase Intention	0.032	0.790	[-0.048, 0.112]	0.43	No
H6c	Social → Trust → Purchase Intention	0.062	1.860	[-0.001, 0.130]	0.064	No*
H6d	Cognitive → Trust → Purchase intention	0.156	4.220	[0.087, 0.232]	0	Yes

Mediation

Regression analysis and the percentile bootstrapping method with 10,000 subsamples were used to investigate the mediation effect. The research considers the mediating factors of AI-based voice assistant trust and usefulness in relation to MCI characteristics. The results of the PLS-SEM mediation study indicate several important indirect linkages that impact purchase intention. The link is considerably mediated by functional motivators through trust (H6a, β = 0.117, p = 0.010) and usefulness (H5a, β = 0.077, p = 0.003), demonstrating their mediating effects. Social motivators also exhibit a significant usefulness-based mediation effect (H5c, β = 0.055, p = 0.012). Cognitive motivators significantly mediate through trust (H6d, β = 0.156, p < 0.001), with marginal significance through usefulness (H5d, β = 0.031, p = 0.085). Social motivators show marginal significance for trust-based mediation (H6c, β = 0.062, p = 0.064). However, hedonic motivators show no significant mediation through either trust (H6b, β = 0.032, p = 0.430) or usefulness (H5b, β = 0.011, p = 0.555).

DISCUSSION

The results mostly validated H1 (a & c) and H2 (a & d), the hypotheses put forth. The impact of MCI (motivated consumer innovativeness) with respect to independent variables (functional, hedonic, social, and cognitive) on the utilisation of AI-based VAs in connection to purchase intention is demonstrated empirically. Although there has been past research looking at Consumer Motivated Innovativeness (Hwang et al., 2023), concerning purchase intention, the field of AI-based VAs has not been studied as much. Early research outcomes have highlighted the significance of both hedonistic and functional (utilitarian) elements in innovative technology interfaces (A. Liu et al., 2023). This is confirmed by our results, projecting a considerable impact on purchase intentions for new products. However, our study distinctly used trust and usefulness, considering the typical behaviour of Indian customers.

The study also shows that online buyers' purchase intentions are likely to increase when VA usage is motivated by perceived utility and trust in technology. Moreover, our findings support the claims of previous research by demonstrating that social MCI influences purchase intention as well, especially for online customers. In particular, the cognitive motive for using VAs enhances purchasing intention. (K. Y. Lee et al., 2021), implying that consumers are more likely to make purchases when they seek experiences that exceed their current mental states. This result validates the impact of MCI aspects on perceived usefulness and trust, supporting H1 (a & c) and H2 (a & d). Notably, H2b (hedonic → trust & usefulness) was not supported, suggesting that enjoyment-driven adoption does not translate to trust formation in the Indian context. Additionally, H1d (cognitive → usefulness) and H2c (social → trust) demonstrated marginal significance (p < 0.10), suggesting these relationships

may require larger samples or contextual refinement for conclusive evidence.

The findings highlight how important AI-enabled technologies are to online retail. Furthermore, online customers' faith in these cutting-edge technologies is increased when they believe AI-enabled VAs to be practical and helpful. Online buyers' perceived utility of AI-enabled VAs increases when they assume that utilising them will impress others. Similar findings were obtained in research on the influence of social MCI on perceived usefulness (Mari & Algesheimer, 2021). Furthermore, cognitive MCI marginally affects usefulness (p = 0.057) and significantly affects trust, suggesting that intellectually curious consumers scrutinise system competence to form trust judgments, though their utility perceptions may depend on additional functional demonstrations. In summary, the study finds that using virtual assistants (VAs) for online shopping is likely to improve perceived usefulness and build trust in technology when consumers are motivated by functional hedonic, social, or cognitive considerations. This study has successfully drawn insights, particularly regarding MCI in the usage of AI-enabled VA. At the same time, trust and usefulness mediate the formation of favourable intentions to purchase the products.

A substantial body of statistical evidence highlights the influence that online buyers' purchase intents have on their perceptions of the utility and trustworthiness of AI-enabled voice assistants. The critical role that trusts and usefulness play in manipulating online customer attitude is supported by hypothesis

H3 and H4. These results are aligned with earlier studies showing that online shoppers' behaviour is strongly influenced by their perceptions of the utility and trustworthiness of AI-based voice assistants. This shows a strong correlation between online consumers' buying intentions and the perceived usefulness and trustworthiness of products, suggesting that both variables have a favorable impact on purchase intentions, barring cognitive and hedonic factors related to usefulness and social motivators related to trust. The mediating role of trust and usefulness is found to be critical in this model, which demonstrates the Indian customer behaviour of adapting to this innovative product in the Indian market. MCI, being the stimulus, manifests the organism in the form of trust and usefulness, resulting in purchase intention as a response.

The Q^2predict values indicate the model's relevance and accuracy in forecasting purchase intentions. The LM model provides better prediction error metrics than the PLS-SEM model. This demonstrates that the structures and relationships included in the model are well-suited for predicting purchase intentions in the setting of AI-enabled voice assistants.

This research assesses the importance of AI technology in marketing and provides important theoretical advancements. It also thoroughly evaluates the reasons for using AI-imbibed voice assistants (VAs), including customer intention to purchase, trust, and usefulness. One of the previous research projects has investigated why consumers utilise AI-imbibed tools and technologies,

e.g., (Lalicic & Weismayer, 2021), which provides insight into how these technologies affect online shoppers' intentions to make purchases, particularly when it comes to usefulness and trust as mediators. Therefore, our work significantly advances theory by investigating the significance of motivated customer innovativeness aspects on customer purchase intention through trust, and usefulness within the Voice Assistants usage for the first time.

Our suggested framework clarifies the bonding between MCI (motivated customer innovativeness) and purchase intention in line with Kautish et al. (2023)'s work . For VAs, purchase intention, trust, and perceived usefulness can be assessed by utilising the consumer innovativeness theory and the Stimulus-Organism-Response (S-O-R) model. We show that online customers' actions with relation to perceived utility, trust, and intention to purchase are significantly influenced by the four MCI facets: functional (practical benefits), hedonic (entertaining elements), social influences, and cognitive reasons. These results align with the outcome of research done by Mari and Algesheimer (2021).

The current work highlights the significance of consumer innovation in the adoption of AI-enabled voice assistants (VAs), thereby transforming the choices of online buyers. In the context of online buyers' use of VA technology, the study shows that customer innovativeness is motivated by functional (practical benefits), hedonic (entertaining elements), social influences, and cognitive motivating goals through trust and Usefulness.

The study identifies several significant management takeaways for e-retail marketing managers and developers of AI-enabled voice assistant (VA) interfaces. AI-enabled VA services must be customised, particularly in different markets like India, where economic, social, and linguistic factors significantly impact consumer behaviour. It is recommended that marketers work with production managers to develop and market goods that prioritise customisation, personalisation, coolness, and ease of use (Malodia et al., 2023). These components are required to improve customers' Motivated Consumer Innovativeness (MCI) on a functional, hedonistic, social, and cognitive level.

As per the findings, functional MCI has the highest scores in shaping purchase intentions, followed by cognitive (through trust) and social MCIs. Contrary to expectations, hedonic MCI did not have a significant impact on trust and usefulness, implying that entertainment-related aspects are less important than functional dependability for Indian consumers. For effective engagement of online shoppers, AI-powered VA services must focus more on task efficiency and competence signalling rather than entertainment aspects. Cognitive and social MCIs had marginal effects, implying that intellectual curiosity and social signalling are important but less important than functional aspects. This contrasts with past research. (Mari et al., 2024) That showed more significant influence from cognitive, hedonic, and social MCIs. Therefore, online marketers

might enhance AI-enabled VA measures to satisfy customers' wants and expectations better.

The utility and trustworthiness of AI-enabled virtual assistants influence online buyers' intent to make purchases. The study shows that purchase intention is significantly impacted by perceptions of AI-based VAs' utility and trustworthiness. Since functional motivators showed the strongest impact on both perceived usefulness (β=0.282, p<0.001) and trust (β=0.248, p<0.01), with significant indirect effects on purchase intention (H5a: β=0.077, p=0.003; H6a: β=0.117, p=0.010), it is recommended that managers focus on task efficiency-related features like "Quick Reorder" functionality and one-command purchase completion rather than entertainment features. Developers should allocate R&D efforts to enhancing the accuracy of Indian accent recognition and sub-second response times instead of focusing on aesthetic improvements because utilitarian value has been shown to be more important than hedonic value. Although the 'hedonic→trust' association is still non-significant (β=0.067, p=0.426), hedonic features could be used to increase perceived usefulness by simplifying task accomplishment (H5b: β=0.092, p=0.004); hence, hedonic features should be incorporated only if they are shown to improve functional efficiency rather than being used as engagement tools.

With trust's strongest direct effect on purchase intention (β=0.473, p<0.001, f^2=0.319), platforms must therefore establish data usage notices, "task completion confirmation" notifications, and failure recovery plans with immediate human-agent escalation to confirm competence. This requires an 'Infrastructure > Interface > Innovation' resource allocation: secure accent-resistant NLP and latency improvement prior to aesthetic design. In Tier-2 and Tier-3 markets, where technology anxiety heightens trust issues, "Assisted Voice" hybrid solutions enabling visual verification for high-value transactions can be used. These recommendations have boundary conditions: as voice commerce evolves, the importance of hedonic motivators may rise, and longitudinal monitoring of potential changes from utility-oriented to experience-oriented adoption patterns may be required.

This is confined to Telangana state, India, which could restrict the suitability of inferences to the rest of the markets with distinct socio-economic and cultural segments. The research was limited to voice assistants (particularly, Alexa) with AI capabilities in online retail. To provide a more thorough knowledge of consumer behaviour in the digital marketplace, future studies could expand on this inquiry to incorporate other technical tools utilised in online buying, such as AR (Augmented Reality), AI-driven customisation, and VR (Virtual Reality) effects.

In addition, a Google Form questionnaire was used to gather responses for the current research. This approach has advantages, including convenience and broad reach, but it might not adequately represent the range of customer experiences and behaviours.

Multiple data-gathering approaches, including focus groups, observational studies, and interviews, could be adapted in further research to enhance profound outcomes and the richness of the data.

Although this offers insightful information, the scope of MCI could be expanded further to investigate its effects on other developing technologies and environments. To expand on the theoretical and practical ramifications of MCI, future studies could investigate how MCI influences customer behaviour towards wearable technology, smart home appliances, and other AI applications beyond retail. Additionally, while H1d (cognitive → usefulness) and H2c (social → trust) approached significance ($p < 0.10$), they did not reach conventional thresholds ($p < 0.05$). Future research with larger sample sizes or cross-cultural comparisons may clarify whether these relationships are context-specific or generally applicable.

CONCLUSION

This research contributes valuable understanding to the evolving domain of consumer-AI interactions by examining how motivated consumer innovativeness shapes purchase behaviours through AI-enabled voice assistants in online shopping environments. The empirical findings from Telangana, India, reveal the complex association between different consumer motivational dimensions and their subsequent impact on trust formation and perceived utility.

The study demonstrates that consumer engagement with AI voice technology is driven by multifaceted motivations, striving for practical utility, entertainment value, social positioning, and intellectual aspects. Significantly, the research establishes trust and perceived usefulness as critical psychological mechanisms that transform these diverse motivational drivers into concrete purchase decisions. This mediation process explains how consumers navigate the transition from initial interest in AI technology to actual commercial adoption.

The theoretical contributions extend existing technology acceptance frameworks by integrating motivational diversity and highlighting the mediating plots through which consumer behaviour influences AI commerce adoption. From a practical standpoint, these insights provide strategic direction for e-commerce platforms and AI developers in designing voice assistant interfaces that suit local market conditions.

While these findings offer substantial insights, the research scope presents certain boundaries, including geographic specificity, methodological dependency on survey data, and focus on voice assistant technology exclusively. Future scholarly endeavours could enhance generalisability by exploring varied cultural and economic contexts, incorporating mixed method approaches for richer data collection, and examining consumer motivational patterns across the regions in India. Such expansions would deepen theoretical understanding of consumer-technology relationships in our increasingly digitised market space.

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