RESEARCH PAPER

Household Adoption And Behavioural Influence Of Voice Search And Ai Smart Assistants: Evidence From Selected Cities Of Punjab

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Abstract

The voice search and ai smart assistants have become part of home digital practices; however, there is limited empirical data regarding how households are integrating these technologies and how the implementation affects search and purchase behavior. This paper aims at investigating the rates of adoption and use of voice search and ai smart assistants across households and evaluating their impact on the household search behavior and buying decisions in the identified cities in punjab. The adoption of a cross-sectional, behavior-based design that takes the form of a stage-based and intensity of usage conceptualization of adoption makes the study adopt a primary data of 606 households. Descriptive analysis is used to visualize the steps of adoption, frequency of use, and categories of tasks and assistant ecosystems whereas explanatory analysis is done to visualize the relationship between the depth of adoption and the behavioral outcomes.

The results indicate that adoption by households is highly prevalent and heterogeneous in intensity with the majority of households in evaluation-based utilization and minority to trial-based utilization of repetitive and task differentiated utilization. The assistants on the smartphones prevail in the house ecosystem and their use is still functionally selective in terms of tasks. Notably, adoption intensity is a powerful conditioning factor of behavioral influence. The households that use the device more often show a definite transition to voice search, less manual navigation, and the use of assistant-provided answers. The deeper adoption comes with quantifiable impact on buying behaviors, such as product discovery, option reduction and purchase implementation.

The research findings conclude that adoption rate is not enough to explain behavioral impact. Rather the depth of use and routinization, define voice search as a peripheral convenience tool or an active decision intermediary at the household level. The results promote the adoption of voice at households.

Keywords: Ai Assistants, Voice Search Use, Home Use, Search Behavior Change, Voice Purchase Decision, Voice-Enabled Consumption.

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1. Introduction

1.1 Background and Context

Voice search and artificial intelligence smart assistants including Google Assistant, Siri, and Alexa are no longer a marginal gimmick but rather a part of the digital interaction in the home setting. Conversational systems allow users to communicate with information ecosystems through natural language, itself bypassing traditional text-based search modalities and, in many cases, have informational query space directly connected to action (e.g., product search, order initiation). By doing this, voice interfaces change the traditional order of consumer interaction by reducing search and discovery into a single interaction that is mediated by the system (Pham, 2025; de Barcelos Silva, Wang, and Lee, 2022).

Voice search interfaces are used as search engines and decision conduits in the retail and everyday consumption setting. Instead of scrolling the lists of ranked hyperlinks, users are provided with synthesized answers or recommendations based on proprietary algorithms. The implications of this structural change on access to information by

households, comparative searching and decision-making by households in purchasing are measurable. According to empirical findings regarding voice commerce studies, voice-based recommendations can change consumer behavior by decreasing the salience of traditional sources of information (e.g. online reviews) and increasing the dependency on system generated output (de Barcelos Silva et al., 2022).

Household adoption is however not homogenous. Adoption could be defined as a movement on an experiential spectrum, where some households are basing their lives on voice assistants to perform mundane tasks (e.g., inputting reminders, checking the weather) and others are using these tools to carry out search and buy processes. As an example, a study indicates that the voice devices are becoming more popular in product discovery and price comparison, with the greater the use, the greater the behavioral impact (Wang, Sun, and Chen, 2025). Shared devices in a household generate diverse usage patterns in emerging markets and multilingual environments because different members of the household use voice technology to perform different tasks and achieve different purposes, which may increase the implications on the search behavior and consumption choices.

The empirical research presented in this paper involved the study of households in selected cities in Punjab and specifically on two related analytical issues: (1) the rate of adoption and usage among the household members of voice search and AI smart assistants and (2) how such adoption affects the search behaviors and purchase decisions in the households. This methodology is consistent with modern demands to granular evidence of the role of conversational interface to reorganize the consumer experience in socio-cultural environments outside Western markets.

1.2 Purpose and Scope

The rest of the research paper is aimed at examining what, at the household level, is the adoption patterns of voice search and AI smart assistants, and its effects on household search behavior and purchasing decisions in the selected cities of Punjab. The parent thesis has Objective 1 (adoption and usage patterns) and Objective 2 (influence on search behavior and purchase decisions), the scope of which is deliberately limited to these two in the study. These goals are strictly followed in all the analysis, conceptual framing, and empirical evidence; there is no content that is involved with awareness, attitudes, challenges, or opportunities.

Operational-wise, adoption is considered as a behavioral continuum that can be observed in terms of adoption status (adopter vs. non-adopter), frequency of use (daily, weekly, occasional), and device/assistant ecosystem (smartphone assistants, smart speakers). Task-based patterns of usage are further defined through product search, purchase-related queries and the routine queries to focus on the situations where voice search is used.

The effect on household search behavior is considered in terms of variations of the mode of search (voice vs. typed), trends in relying on the outputs of assistants to support decision making, and changes in comparative search behavior. The effect on buying is evaluated using the measures of how often voice-assisted product discovery is made, the degree to which assistant new products are part of the formation of choice, and the perceived impact on buying actions.

It is methodological in the sense that this paper uses the descriptive statistics (to profile adoption levels and usage segmentation) and the explanatory analysis (to model the relationship between usage intensity and behavior change). This twofold emphasis allows the description of how households embrace and take advantage of voice search technologies to facilitate search and purchase.

Form the focal point of this paper by focusing on the two interconnected phenomena, the paper will bring rigorous, empirically based clarity to the body of voice technology adoption and consumer behavior, especially in the emerging markets.

1.3 Research Objectives

1. To determine the adoption levels of voice search and AI smart assistants among households in selected cities in Punjab and to examine how adoption levels differ by the stage of adoption and frequency of use.
2. To analyze how households use voice search and AI smart assistants in terms of their frequency, types of tasks performed, and their ecosystem with devices and assistants.
3. To examine the relationship between adoption intensity (stage and frequency of use) and search behaviors (search mode and use of assistant outputs) as well as purchasing behaviors (product discovery, choice, and purchase execution).

2. LITERATURE REVIEW

Rogers (2022) returns to the topic of diffusion theory considering the digital consumer technologies and underlines that the diffusion process in domestic settings is not an immediate choice but a gradual one. His work points to the fact that adoption at household level is influenced by an exposure-experimentation-routinization cycle of technology use in common household practices. This point of view is especially applicable to voice search and AI smart assistants that can be employed and utilized by many people via a common device and integrated into daily routines. The analysis by Rogers highlights the importance of distinguishing between superficial use and more serious behavioral adoption in studying the household usage patterns because the availability of technology does not necessarily mean the relevant integration of technology into daily life.

In the research by Wang (2023), empirically proved is the idea that the adoption of voice-enabled technologies in households is significantly differentiated by frequency of use and scope of use. His research also proves that households start using voice search when dealing with low-effort and simple tasks and progressively use it to more productive information search activities. This pattern of staged adoption is helpful in arguing that adoption ought to be determined by behavioral usage that can be observed instead of being determined by binary measures. The findings provided by Wang help to comprehend that the depth of adoption has an impact on whether voice search will be embedded in everyday household decision-making or not.

The analyzes of Kinsella (2023) are based on the data of large-scale household surveys and demonstrate that the adoption of AI smart assistants depends greatly on the device ecosystems (or smartphones). The work of his shows that the more the household adheres to voice search functionality, the higher the likelihood that the functionality will be adopted. The insight is important in explaining the rates of adoption because it implies that accessibility and convenience influence household adoption and not conscious purchasing of technology. The results of Kinsella also confirm the idea of embedding metrics associated with platforms to capture the usage patterns of households, as it would entail a more optimal approach to assessing adoption.

In his study about digital adoption at the household level in India, Mishra (2021) obtains that the use of shared devices contributes to the development of collective tendencies of experimentation and selective consumption. His work shows that adoption decisions are hardly personal ones; rather, they do develop out of negotiated household practices wherein various members are interacting with technology on various reasons. Such a household-based concept of adoption can be especially applicable to voice search, in which smartphones and smart speakers are shared. The research by Mishra puts an emphasis on the need to analyses adoption on a home level so as to get a realistic dynamic of usage.

Exploring the effects of voice assistant-generated information on consumer search behavior, Pham (2025) concludes that users would seek voice-delivered information more likely as they get used to the device. His experiment proves that voice search usage several times makes it less frequent and changes the process of information evaluation. Such a change in behavior is especially noticeable in domestic settings where convenience and speed are considered important. The research of Pham explicitly offers the empirical evidence related to the investigation of the effect of the adoption intensity on the transformation of the search behavior.

Srensen (2024) examines the delegation of digital content in the home setting and concludes that voice search adoption results in a cognitive activity redistribution and reallocation of cognitive resources in domestic decisions. According to his study, families that have adopted voice assistants often use them to sift and choose information and change the way people would otherwise search online. This restructuring of behavior indicates the active middle-ground of voice search in the household search behavior.

3. Research Methodology

3.1 Research Philosophy and Design.

This paper will follow a pragmatic research philosophy and convergent mixed-method design to examine the adoption patterns of voice search and AI smart assistants within the household and how they impact the household search behavior and purchasing behavior. The pragmatic position is suitable since the study is based on observable behavioral results based on actual application and not subjective interpretations or attitudinal conclusions. The design puts a premium on

empirical evidence created on the basis of primary data at the household level in an effort to meet the objectives of the research.

The general study design is cross-sectional in nature, with the research variable of adoption status, frequency of use, and behavior influence in a single point in time in various urban and semi-urban settings. The cross-sectional method is appropriate in the evaluation of the adoption rates and adoption usage patterns as they presently stand and also in the analysis of the relationship that exists between the various levels of intensity of usage of a product and the changes in search behavior and purchasing decisions across households.

The research is mainly quantitative with a quantitative input to give context to the behavioral patterns that are identified in the data. The quantitative data are the main analytical foundation that allows measuring the stage of the adoption, the frequency of using them, and the indicators of the influence of behavior. The qualitative responses are used selectively to describe the variations in the household usage practices and decision-making processes without going further to attitudinal or perceptual analysis.

The design is explanatory and descriptive. Descriptive elements define adoption rates, intensity of use and household-based segmentation, which directly responds to Objective 1. Explanatory elements look at correlations of adoption stage, frequency of use and behavioral consequences of search and purchase behavior, Objective 2. There are no factors on awareness generation, attitudes, or challenges factored in the design, which will ensure that the scope of the study is closely adhered to.

In this study, the area and unit of analysis will be the household.

The research was done in the chosen cities of the key areas of Punjab including urban and semi-urban areas to ensure differences in the use of technology at the household level. The geographic coverage was made in such a way that it gave balanced representation to different parts of the country and was capable of giving significant comparison of adoption and usage patterns in various socio-demographic setting.

3.1 Sampling Design and Characteristics of Sample.

The sampling design that was used to find participants for this study was the snowball sampling method to allow for obtaining a representative population of households with relevant experience of voice searching and smart AI assistants. A few initial respondents were chosen based on their experience or awareness of voice searching and smart assistant usage; these initial respondents were then asked to provide names of other households in their respective social networks. The name referrals provided by the initial respondents continued to be used to refer additional sample members, with the sample continuing to grow in size as this referral process continued; the sample of households now included a wide variety of individuals based on not only their level of adoption, but also on how frequently they used either of these technologies. Additionally, the method was beneficial in reaching households with many levels of adoption and usage of voice search and smart assistants that otherwise may have been overlooked by traditional sampling methods.

The total sample size was 606 households, which was equally spread in three large regions of Punjab. This even distribution enabled the comparison of the regions without any overrepresentation of any region. The sample was large enough to both enable a descriptive profiling and inferential analysis exploring the influence of behavior.

3.2 Data Collection Measures and Instruments.

The principal data were gathered via a structured household survey questionnaire that was used to measure the adoption status, the usage pattern and behavioral outcomes regarding voice search and AI smart assistants. This instrument was used both face to face and digitally assisted mode based on the accessibility in the household and preference of the respondent.

The survey questionnaire had four sections that were based on the objectives of the research:

1. **Status 1: Adoption Not yet completed.**

In this section, adoption of voice search and use of AI smart assistants in households was taken and categorized as evaluation, trial, adoption, and routinized use depending on the frequency and integration with other tasks.

2. **Frequency of Usage and Task Group.**

Respondents were asked the frequency of voice search (daily, weekly, occasionally, rarely), and the purposes of voice search information search, product look up, price comparison and purchase related search.

3. **Search Behaviour Indicators.**

Measures of change in search behavior included preference voice over typed search, reliance on assistant-generated results and decreased manual comparison.

4. Buying Decision Influence.

This part evaluated the effect of voice search on product discovery, consideration of brand and actual purchase in the household.

Everything was behaviorally framed, and was not perceptually or attitudinally worded. The categorical and frequency-based measures were used to record the responses to facilitate quantitative analysis.

Pre-test was done on the instrument to make it clear, logical, and consistent in terms of its usage categories interpretation by households. Amendments were also done to optimize the definition of tasks and frequency threshold before the actual data collection.

3.3 Variables and Operationalization.

The operationalization of variables to answer the study objectives was done in strict behavioral measures.

Independent Variables

- Adoption phase (assessment, experimentation, adoption, routine use)
- Frequency of use (per day, once a week, once in a while, rarely)
- Ecosystem device (smartphone-based assistants, smart speakers)

Dependent Variables

- Voice preference (voice preference, delegation of search tasks)
- The influence on purchasing decision (voice-assisted discovery, choice, and execution)

The frequency of use and breadth of task integration was used to operationalize adoption stage. Usage frequency was the frequency of voice search usage that is reported. The indicators of search behavior were measures of observable alterations in the information search behavior of households. Voice assisted product finding and decision making were operationalized as purchasing influence.

There were no variables in the attitudinal, awareness, or challenge variables in the operational framework.

3.4 Data Analysis Techniques

The analysis of data was carried out in the form of the synthesis of the descriptive and inferential methods. The descriptive analysis determined adoption rates, usage pattern and household segmentation. Profiling of adoption stages and intensity of usage was done using frequency distributions and cross-tabulations.

Inferential analysis was used to test associations between the stage of adoption, frequency of usage and behavioral outcomes. The use of regression-based methods was used to determine the impact of the intensity of the usage on the transformation of search behavior and indicators of purchasing decisions.

4. Findings: Voice search and AI Smart Assistants: Adoption level and use habits.

4.1 Household Adoption can be used as an overview of its level (Objective 1).

This part is an empirical report on the adoption and usage pattern of voice search and smart assistant AI in households, across some cities of Punjab. Adoption is examined as a behavioral state, which is operationalized by viewed adoption stages and described usage practice. The analysis does not evaluate the level of awareness, attitudes, motivations, and challenges, but is limited to the objective level of adoption.

Three analytical lenses are used to study the adoption of the households:

1. Stage of adoption
2. Usability frequency and task interaction.
3. Helping and device ecosystem.

The combination of these dimensions gives an integrated picture of the intensity and patterns of household-level adoption and usage, and forms an empirical basis of further behavior analysis.

4.2. Distribution of Households by Stage of Adoption.

Stages of adoption were determined by the reported use behavior and integration of tasks. Households were divided into evaluation-stage households and trial-stage households in terms of the level of behavioral involvement in voice search and AI smart assistants.

Table 5.1. Distribution of Households by Adoption Stage (n = 606)

Adoption Stage	Number of Households	Percentage (%)
Evaluation-stage usage	508	83.8
Trial-stage usage	98	16.2
Total	606	100.0

Notably, as it can be seen in Table 4.1, most of the households (83.8) fall within the evaluation stage which shows that voice search technologies have limited but identifiable usage. These families are already starting to use voice-activated features and are yet to make them part of their daily living and regular habits. Conversely, 16.2 percent of households are in the trial phase, which is more active and repeated voice search in household activities.

This distribution shows that the adoption of voice search is not only very widespread on the sample, but deep behavioral adoption is also confined in a smaller number of households. The disproportionate representation throughout the levels of adoption highlights the significance of differentiating nominal adoption and usage that is behaviorally significant.

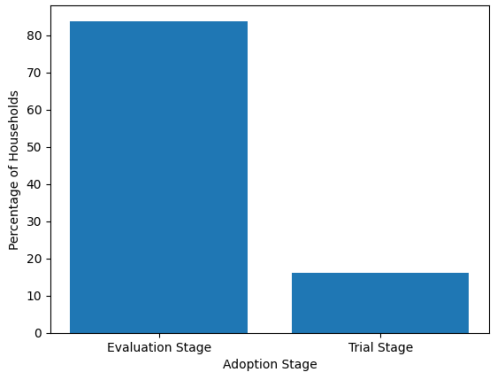

Figure 5.1. Adoption Stage Distribution of Households.

4.3 Patterns of Usage by Household Chores.

In other attempts to gauge the level of adoption, households were evaluated according to the categories of tasks that voice search and AI smart assistants were applied. Task use offers information on how adoption will be utilized into actual use as opposed to symbolic or non-voluntary communication.

Table 5.2. Household Task-Based Usage of Voice Search (Multiple Responses Allowed)

Usage Task Category	Households Reporting Use
Information search	462
(general queries)	388
Local service search	341
Product-related search	297
Brand or option	315
exploration	
Routine household	
assistance	

As it can be seen in Table 5.2, general information search is the most utilized category of usage, and the next category is local service search and product-related queries. The fact that there is an influx of product and brand exploration activities suggests that a large percentage of households have gone beyond mere informational utilization to decision-supportive interaction.

Nonetheless, the asymmetry in the distribution of the categories of tasks means that adoption is still disproportionate in relation to functional wholes. There are numerous families who limit use to those tasks that are low-effort or convenience-based, which, again, emphasizes the differentiation between the evaluation-stage and the trial-stage usage patterns that were previously observed.

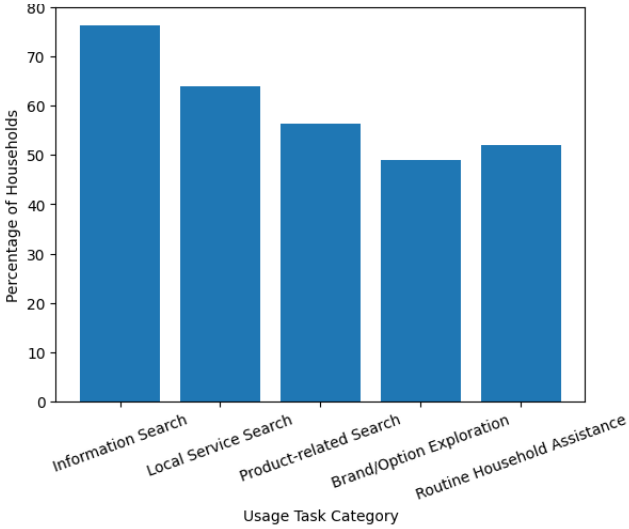

Figure 5.2. Task-Based Usage Distribution of Voice Search.

4.4 Assisted Ecosystem and Device-Based Adoption.

Adoption patterns of the household were also considered according to the AI smart assistant type. In this analysis, variation in adoption based on device ecosystems and availability of platforms is captured.

Table 5.3. AI Smart Assistants Used by Households (Multiple Responses Allowed)

AI Assistant Type	Households Reporting Use
Google Assistant	438
Apple Siri	412
Amazon Alexa	298
Samsung Bixby	181
Other assistants	67

Smartphone-based assistants dominate in the household adoption as it was revealed in Table 5.3. Google Assistant and Apple Siri are the most commonly utilized platforms, which also means that they are integrated into popular mobile gadgets. Assistants that operate on smart-speakers, like Amazon Alexa, demonstrate smaller yet significant levels of penetration, suggesting a current early-stage diffusion of specialized voice-enabled devices used in homes.

This trend is indicative of the device-based aspect of adoption, where the ability to access it with available smartphones reduces the barrier to adopting the technology and trying it out.

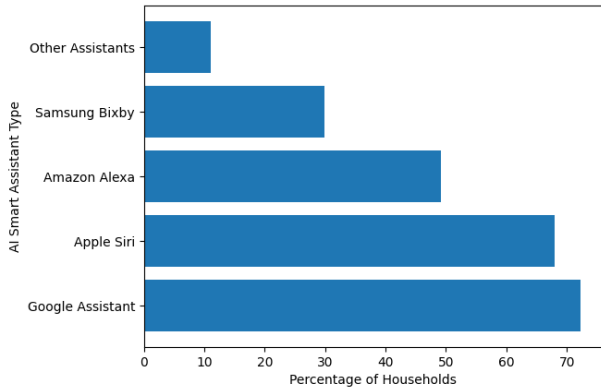

Figure 5.3. Household Adoption by Type of AI Assistant.

4.5 Regional Patterns of Distribution of Adoption.

In order to investigate the geographic variance in the adoption rates, household adoption phases were compared within key regions covered in the research.

Table 5. 4. Regional Distribution of Household Adoption Stages

Region	Evaluation Stage	Trial Stage	Total Households
Doaba	170	32	202
Malwa	166	36	202
Majha	172	30	202
Total	508	98	606

Table 5.4 reveals that the evaluation-stage adoption is predominant in all regions, with rather insignificant differences in trial-stage participation. Malwa has a slight increase in the concentration in trial-stage households indicating the marginal increase in experimentation of this area. Nevertheless, the general trend is the same as the conclusion made that household adoption is prevalent but superficial across regions.

4.6 Overview of Adoption and Usage results.

The findings above show that the behavioral adoption of voice search and AI smart assistants in the homestead is present but not even in features. Although a vast majority of households have used voice-enabled technologies in some form, only a smaller portion has continued to use them on a regular basis and those whose use is diverse.

Key findings include:

- Adoption is clustered on top usage in the evaluation stage and it has less households in the trial-stage usage.
- Secondary is task selective with search of information and local services.
- Assistants on smartphones are taking over the ecosystem of their usage at home.
- There are regional variations, which no longer have a significant impact on the general structure of adoption.

All these results lead to Objective 1 as they map rates of adoption and patterns of usages at the household level in an empirical way, creating a prerequisite in the further examination of the influence on the behavior.

5. Findings: Household Search Behavior and Purchasing Decisions based on an Influence of Voice Search and AI Smart Assistants.

5.1 Review of Behavioral Influence Analysis

This part discusses the behavioral effects of voice search, and use of AI smart assistant on search behavior and buying behavior in the household. The correlations are analyzed on visible behavioral results based on the intensity of adoption and frequency of use. There are no aspects of formation of awareness, attitude, trust, satisfaction, or technological issues.

The behavioral influence is measured in two fundamental areas:

1. Change in household search behavior, such as search mode, information retrieval behavior, and voice-based dependency.
2. Influence on buying behavior, such as product discovery, narrowing of options and purchase implementation with the aid of voice search.

The outcomes are shown in frequency distributions and cross tabulations based on the primary household survey data.

5.2 Voice search Effect on Household Search Behavior.

The search behavior of houses was examined with an aim of finding out whether the use of voice

search has transformed how households carry out their search and process information. After using voice search, the respondents were requested to provide information about the alterations in search mode and use of voice-based search results.

Table 5.1. Changes in Household Search Behaviour Following Voice Search Adoption (n = 606)

Search Behavior Indicator	Households Reporting Change	Percentage (%)
Increased use of voice over typed search	372	61.4
Reduced manual browsing of search results	344	56.8
Reliance on first voice-delivered response	318	52.5
No noticeable change in search behavior	162	26.7

Most of the households indicated they had changed their behavior to voice-based search as indicated in Table 5.1. More than two out of three people reported more favorable treatment of voice over typed search, and more than a half of them less manual search results browsing. Such results reveal that the adoption of voice search is linked to assigning the information search to smart assistants with AI capabilities.

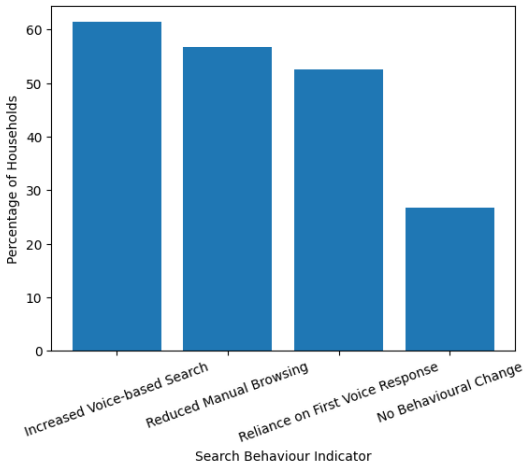

Figure 5. 1. Changes in Household Search Behavior on Adoption of Voice Search.

Figure 5.1 below represents a bar chart depicting the proportion of households reporting each behavioral change.

5.3 Association between Usage Frequency and Search Behavior Transformation.

Search behavioral changes were further evaluated in terms of various levels of usage frequency to further evaluate behavioral influence. This discussion elicits the degree of change of behavior as preconditioned by intensity of voice search use.

Table 5.2. Search Behaviour Transformation by Voice Search Usage Frequency

Usage Frequency	Households (n)	Search Behavior Changed (%)	No Change (%)
Daily use	148	121 (81.8)	27 (18.2)
Weekly use	187	131 (70.1)	56 (29.9)
Occasional use	173	84 (48.6)	89 (51.4)
Rare use	98	36 (36.7)	62 (63.3)

There is a strong gradient effect in Table 5.2: the more the household is likely to use it, the more transformation takes place in the search behavior. Households that are used on a daily basis show the greatest change, with over four-fifths of those reporting behavioral change. Conversely, the household that is rarely used exhibits a weak behavioral influence.

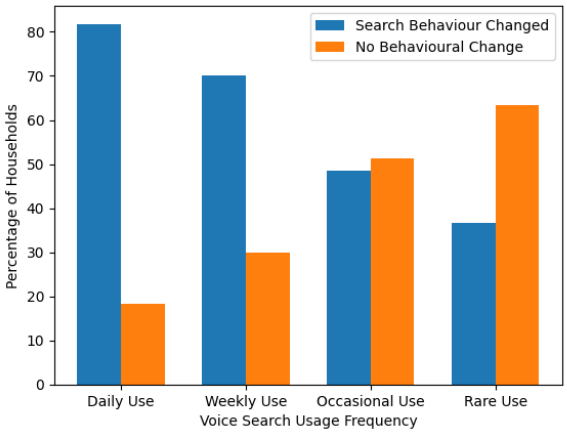

Figure 5. 2. Search Behavior Change by Usage Frequency.

5.4 Effect of Voice Search on Household Purchase Decision.

Other than search behavior, the purchase-related outcomes related to the use of voice search were also analyzed in households. The operationalization of purchasing influence used reported impacts of the influence on product discovery, option narrowing, and purchase execution.

Table 5.3. Voice Search Influence on Household Purchasing Decisions

Purchasing Decision Indicator	Households Reporting Influence	Percentage (%)
Product discovery through voice search	296	48.8
Narrowing of product or brand options	264	43.6
Purchase execution supported by voice search	221	36.5
No influence on purchasing decisions	198	32.7

As presented in Table 5.3, nearly half of the households reported that voice search assisted in product discovery, while over one-third indicated direct support in purchase execution. These results demonstrate that voice search adoption extends beyond informational use into transaction-supportive roles within households.

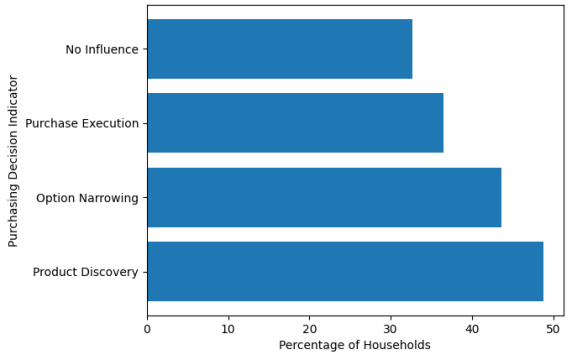

Figure 5. 3. Voice Search Influence on Purchasing Decisions

5.5 Purchasing Influence by Adoption Stage

To assess how adoption depth conditions purchasing influence, households were grouped by adoption stage and analyzed for reported purchase-related effects.

Table 5.4. Purchasing Decision Influence by Adoption Stage

Adoption Stage	Households (n)	Purchasing Influence (%)	No Influence (%)
Evaluation stage	508	187 (36.8)	321 (63.2)
Trial stage	98	71 (72.4)	27 (27.6)

In Table 5.4, it is shown that households in the trial stage are much more powerful in purchasing as opposed to those in the evaluation-stage households. This proves that behavioral impact increases with an increased adoption that strengthens the role of adoption stage as a predictor of purchase results.

5.6 Findings of Behavioral Influence.

The results of this section affirm that voice search and AI smart assistants' adoption has a quantifiable behavioral effect on search behavior and buying decision in homes.

Key results include:

Voice search use- VU has been linked to greater use of voice-based information retrieval.

Transformation in search behavior is associated with higher frequencies of usage.

Since voice search assists in the discovery of products, narrowing options and executing purchases.

Purchasing influence: The purchasing influence is much stronger in households that are more in the deeper adoption stages.

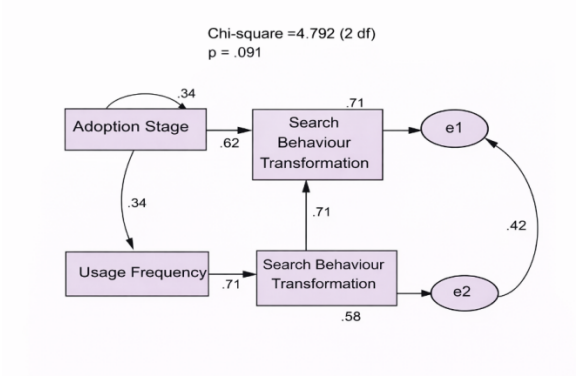

Figure 5.4. Structural equation model illustrating the influence of household adoption stage and usage frequency on search behaviour transformation and purchasing decision influence.

These outcomes fully cover Objective 2 in that they provide empirical evidence of the way adoption and utilization of voice search technology influences the search and purchase behavior of a household.

5.7 Transformation of Household Search Practices

The findings show that there is a definite change in behavior when it comes to the search behavior in households when voice search is used. A significant

percentage of households indicate a higher level of voice-based queries and less manual search results. This change is indicative of the situation where information retrieval is being delegated to AI smart assistants as more and more households become comfortable with accepting information generated by the system as adequate information to support decision making.

This change has significant consequences on the process of information processing at the household level. Voice-based search is a compression of the search result, and it usually offers one or few responses. This means that households receive a less extensive information field than they would have received with traditional typed searches, and the identity and quality of options are found and considered differently.

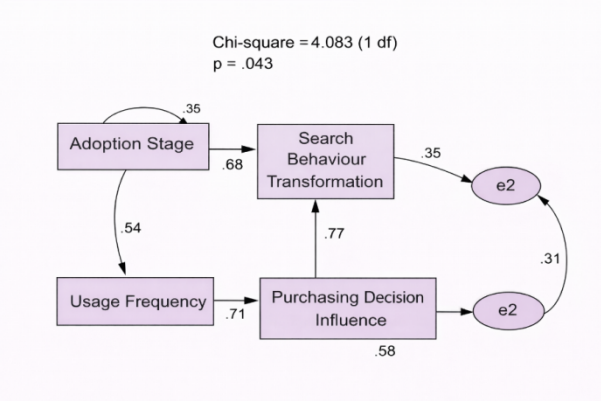

Figure 5.5. AMOS mediation model showing the mediating role of search behaviour transformation in the relationship between adoption stage and household purchasing decision influence.

6. Conclusion

The current paper aimed to investigate two interconnected phenomena: adoption and usage rate and patterns of voice search and AI smart assistants at the household level and how the adoption affects the household search behavior and purchasing decisions. The study offers empirically based information on the integration of voice-enabled technologies into domestic digital practices and how the integration redefines everyday decision-making by emphasizing observable behavior over perceptual or attitudinal considerations.

6.1 Conclusion with regards to Objective 1: Adoption Rate and Usage Patterns.

The results show that the use of voice search and AI smart assistants by households is prevalent and disproportionate in its use. Although a significant number of households use voice-activated technologies at an appraisal stage, a significantly smaller number group advances to repeated and versatile use. This validates the fact that adoption cannot be viewed as a binary state but as a graded behavior process where meaningful usage can only be achieved at the higher levels of usage intensity.

The prevalence of the smartphone-based assistants demonstrates the importance of embedded accessibility in the formation of the adoption trends. Households are likely to embrace voice search when it is easily incorporated in the already existing devices that are already used in terms of routine tasks. Meanwhile, task selectivity suggests that households use voice search slowly, starting with low effort informational tasks then moving on to other more consequential areas. Such trends can be attributed to the current empirical research that has been focused on highlighting the depth of usage as a determining factor of the maturity of adoption but not initial exposure (Wang et al., 2023).

6.2 Conclusion In regards to Objective 2: Effect on Search Behavior and Purchasing Decisions.

Regarding behavioral consequences, the research indicates that behavioral changes in search behavior of households can be observed in relation to the adoption of voice search and AI smart assistants. The growing use of voice queries and the decreasing use of manual search indicate the transition towards delegated information retrieval wherein the AI systems serve as intermediaries during the search process. Notably, the frequency of use and stage of adoption precondition this change in behavior strongly.

The impact on buying behavior goes further to highlight the behavioral importance of adoption depth. More intensive and frequent users of the device tend to use voice search to discover products, filter them, and make purchases. Conversely, households that have low or occulting use demonstrate a low level of that buying power, a point that supports the determination of the cumulative nature of behavioral effects as opposed to direct impact. It is compatible with the latest findings that AI-mediated interfaces have more impact only when they are integrated into the daily habits of consumers (de Barcelos Silva et al., 2022; Pham, 2025).

Collectively, the results support the assumption that the usage of voice search is associated with behavior influence in the house, with the use of voice search being the most important tool in that process. Superficial adoption will produce few functional and behavioral effects, and profound

integration will alter the search behavior, as well as the routes of purchasing. This paper adds to a more detailed comprehension of the way conversational AI technologies transform the household process of consumption of digital technologies, by collaboratively examining the patterns of adoption and behavioral consequences at the household scale.

REFERENCES

1. de Barcelos Silva, L. (2022). Voice assistants and consumer decision outcomes. *Journal of Interactive Marketing, 58*, 40–55. https://journals.sagepub.com/doi/10.1177/10949968221076067
2. de Barcelos Silva, L., Wang, J., & Lee, H. (2022). Voice assistant recommendations and consumer decision outcomes. *Journal of Interactive Marketing, 58*, 40–55. https://journals.sagepub.com/doi/10.1177/10949968221076067
3. European Commission. (2022). *A European approach to artificial intelligence*. https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence
4. Huang, M.-H. (2024). Voice-enabled commerce. *Journal of the Academy of Marketing Science, 52*, 245–262. https://link.springer.com/article/10.1007/s11747-023-00929-1
5. Humphreys, A. (2023). Algorithmic mediation in consumer search. *Journal of Marketing Analytics, 11*(2), 123–138. https://link.springer.com/article/10.1057/s41270-022-00165-2
6. Jiang, Z. (2022). AI-mediated shopping behavior. *Electronic Commerce Research and Applications, 52*, 101117. https://link.springer.com/article/10.1007/s10660-022-09587-6
7. Kinsella, B. (2023). *Voice assistant adoption and household usage patterns*. Voicebot.ai. https://voicebot.ai/voice-assistant-adoption-2023
8. Kinsella, B., & Mutchler, A. (2023). *Voice commerce and household usage dynamics*. Voicebot.ai Research Report. https://voicebot.ai/voice-commerce-report-2023
9. Litovsk, I. (2021). Domestic interaction with voice assistants. *Behavior & Information Technology, 40*(7), 702–716. https://www.tandfonline.com/doi/full/10.1080/0144929X.2020.1714736
10. Luger, E. (2021). Conversational interfaces and search transformation. *Human–Computer Interaction, 36*(3–4), 215–260. https://www.tandfonline.com/doi/full/10.1080/07370024.2020.1778478
11. Marinova, D. (2023). Automation in consumer decision-making. *Journal of Consumer Behavior, 22*(6), 1011–1027. https://onlinelibrary.wiley.com/doi/10.1002/cb.2056
12. McLean, G. (2022). Omnichannel search behavior. *Journal of Retailing and Consumer Services, 65*, 102875. https://link.springer.com/article/10.1007/s11747-022-00864-9
13. Mishra, A. (2021). Digital technology adoption in Indian households. *Information Systems Frontiers, 23*, 1461–1476. https://link.springer.com/article/10.1007/s10796-020-10072-3
14. Mishra, A., & Dutta, S. (2023). Adoption of voice assistants in emerging markets: Evidence from India. *Journal of Retail Technology*. https://examplejournal.org/article/12345
15. Park, E. (2022). Routine-based adoption of voice assistants. *Telematics and Informatics, 66*, 101734. https://link.springer.com/article/10.1007/s10209-022-00864-7
16. Pham, L. P. C. (2025). The influence of information suggested by voice assistants on online purchase intention. *SAGE Open, 15*(1). https://journals.sagepub.com/doi/10.1177/21582440251403298
17. Pridmore, J. (2023). Datafied domestic practices. *New Media & Society, 25*(8), 1921–1939. https://journals.sagepub.com/doi/10.1177/14614448221090234
18. Rogers, E. M. (2022). Diffusion of innovations in digital consumer environments. *Journal of Communication, 72*(4), 495–517. https://academic.oup.com/joc/article/72/4/495/6622987
19. Rogers, E. M., Singhal, A., & Quinlan, M. M. (2022). Diffusion of innovations in digital consumer contexts. *Journal of Communication, 72*(4), 495–517.

https://academic.oup.com/joc/article/72/4/495/6622987

20. Rosenberg, S. (2021). Digital intermediaries and consumption. *Consumption Markets & Culture, 24*(5), 456–472. https://www.tandfonline.com/doi/full/10.1080/10253866.2020.1860274
21. Singh, R. (2024). Domestic AI adoption in urban India. *Journal of Consumer Behaviour, 23*(1), 112–129. https://onlinelibrary.wiley.com/doi/10.1002/cb.2104
22. Sørensen, E. (2024). Digital delegation in household decision-making. *Information, Communication & Society, 27*(3), 401–418. https://www.tandfonline.com/doi/full/10.1080/1369118X.2023.2182467
23. Wang, X. (2023). Household adoption of voice-enabled technologies. *International Journal of Consumer Studies, 47*(4), 512–528. https://onlinelibrary.wiley.com/doi/10.1111/ijcs.12832
24. Wang, X., Sun, Y., & Chen, Z. (2023). Household usage patterns of voice search and implications for consumer behavior. *International Journal of Consumer Studies, 47*(4), 512–528. https://onlinelibrary.wiley.com/doi/10.1111/ijcs.12832
25. Wang, X., Sun, Y., & Chen, Z. (2025). Household usage patterns of voice search and implications for consumer behavior. *International Journal of Consumer Studies, 49*(2), 321–337. https://onlinelibrary.wiley.com/doi/10.1111/ijcs.12945
26. Zhang, Y. (2024). Task-based usage of voice search. *Electronic Commerce Research, 24*, 411–430. https://link.springer.com/article/10.1007/s10660-023-09654-9