"Investigating the effect of perception and customer attitude towards smart voice assistant and their intention to use them"

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Abstract:

Objectives: The study aimed to look into how customers' attitudes and perceptions of smart voice assistants affect their intention to utilize them. The goal of this study is to find out how consumers view smart voice assistants and intend to use them.
Study Location: Cairo, Egypt

Methodology: A questionnaire was given to a purposeful sample of 254 people in Cairo, Egypt, in 2024 in order to collect data. Using a likert scale, the questionnaire asks about customers' perceptions of smart voice assistants (perceived enjoyment, perceived security, perceived value, and perceived convenience), attitudes toward smart voice assistants, plans to use them, demographic information, and general knowledge about them.

Results: Reveal that the majority of the sample is females (63.7%) and most fall within the 18-25 age brackets (68.3%). Additionally, over half report an income of less than 5000 (53.9%) and are college students (64.4%). In terms of smart voice assistants, 94.4% are aware of them, with 84.52% using them. The reliability analysis shows Cronbach's alpha values ranging between 0.8 and 0.9, indicating good internal consistency.

Recommendations: ensuring the security of a smart voice assistant is crucial to protect both user privacy and prevent unauthorized access to sensitive information. Here are some recommendations for improving the security of a smart voice assistant: Security is an ongoing process, and it's essential to stay vigilant and keep up with the latest security practices and technologies to protect voice assistant systems effectively.

To encourage and motivate customers to interact with the smart voice assistant on a frequent basis, incorporate gamification features and incentive programmers. Incentives, accolades, or accomplishments can enhance the fun and engagement of interactions, which can result in a more positive attitude towards technology.

Keywords: Perceived enjoyment, Perceived value, Perceived convenience, Perceived security, Attitude Intention

1. Introduction:

Customers can conduct online transactions by employing voice commands rather than laborious typing through a smart voice assistant. It provides conveniences such as order placement and monitoring, and the purchasing process is expedited through voice commands. The smart voice assistant will present the products, affirm the purchase, and place the order after customers provide their purchase information. Similar to a conversation between salespeople and customers in a physical establishment. The transition from desktop to mobile platforms facilitated voice purchasing, and smart voice assistants further improved the experience by enabling hands-free commands and multitasking. Smart voice assistants have experienced substantial expansion in the marketplace, with a substantial number of individuals intending to acquire them. Smart voice assistants, computers, and mobile/smartphone purchasing all contribute to the overall sales. The emergence of intelligent voice assistants is a significant advancement in the field of human-machine interaction, ushering in a new era of intuitive, personalised, and seamless experiences that surpass traditional interfaces. The way we communicate and navigate the digital world has been completely transformed by smart voice assistants, which began as simple speech recognition systems and have since evolved into omnipresent companions that are an integral part of our everyday lives. Upon contemplation of the trajectory of smart voice assistants, it is evident that the convergence of customer demand for convenience, technological innovation, and the unwavering pursuance of efficiency in a more interconnected society has facilitated their ascent. Today's intelligent voice assistants are indispensable collaborators, as they facilitate users' connectivity, task completion, and information retrieval with unparalleled efficiency, thanks to their advanced artificial intelligence, natural language processing, and machine learning capabilities. These smart voice assistants have been integrated into a variety of devices, including smartphones, smart voice assistants, cars, and home appliances. They are capable of performing a wide range of tasks, including answering questions, providing recommendations, setting reminders, controlling smart home devices, and even making purchases. The seamless integration of smart voice assistants into our daily lives has revolutionised the way we interact with technology and has established a new level of convenience and accessibility. Smart voice assistants are distinguished by their capacity to comprehend natural language and context, which enables more conversational and organic interactions. They can customise their responses and recommendations by continuously learning and adapting to individual preferences and past interactions. This personalised touch improves the user experience and cultivates a sense of camaraderie with these virtual assistants. Additionally, smart voice assistants have created novel opportunities for individuals with disabilities or those who encounter difficulties with conventional user interfaces. Voice-based interaction eliminates barriers and offers an inclusive experience, thereby enabling a broader spectrum of individuals to access and benefit from technology. The potential of intelligent voice assistants is expected to continue to grow in the future. We can anticipate the development of smart voice assistants that are even more sophisticated, with improved capabilities and the ability to integrate with emergent technologies like smart devices and augmented reality, as technology continues to advance. They will continue to develop and become indispensable companions, seamlessly assisting us in our daily lives and influencing the future of human-machine interaction. The emergence of intelligent voice assistants has undoubtedly transformed our digital experiences, and their influence on a variety of industries and sectors is significant. It is anticipated that the smart voice assistant recognition market in Egypt will expand to a value of US$35.52 million by 2024. The market is expected to reach a volume of US$78.97 million by 2030, with a 14.24% annual growth rate (CAGR 2024–2030). In terms of global comparison, the US market, which was valued at US$1,903.00 million in 2024, will be the largest.

2. Research Problem:

This research focused on Egyptian demographics; other articles have not extensively covered this aspect. This could indicate an opportunity to contribute valuable insights into understanding the demographics of Egypt more comprehensively, potentially shedding light on demographic trends and population dynamics. The research is studying the demographic profile of Egypt, which could provide valuable insights into tailoring smart voice assistant technologies to better serve the needs of diverse populations, including those with varying linguistic backgrounds and socio-economic contexts.

3. Importance of the Study:

By incorporating demographic data into the design and implementation of smart voice assistants, developers can enhance language recognition accuracy, improve the user experience, and ensure inclusivity. This study aim is to find out how consumers view smart voice assistants and intend to use them.

4. Theoretical Literature of the Study:

4.1 Perception

4.1.1 Perceived enjoyment

Pleasure as perceived (PE) The essential factors that draw in clients are referred to as hedonic values, which include delightfulness, pleasantness, and enjoyment. According to Venkatesh et al. (2012), hedonic motivation—which is broadly defined as the pleasure and excitement that come from adopting new technology—plays a crucial role in assessing technology acceptance. For customers, enjoyment is the essential element of a satisfying experience and trying something different from others. In addition to giving the user self-fulfilling value, using cutting edge technology and Internet-based systems fosters happiness and contentment (Ramayah & Ignatius, 2005; Sun & Zhang, 2006). Perceived enjoyment (PE) is an intrinsic motivation to implement innovative technology, as per Davis, Bagozzi, and Warshaw (1992), while perceived usefulness is an extrinsic motivation. Alalwan, Baabdullah, Rana, Tamilmani, & Dwivedi (2018) and Lee, Kim, & Choi (2019) have conducted numerous studies that have combined the PE with two additional factors: trust and innovation. Perceived enjoyment (PE) has a substantial impact on the intention of consumers to utilise smart technology, according to Mashal and Shuhaiber (2018). In 2019, Lee et al. defined perceived enjoyment (PE) as a fundamental factor that influences the user's intention to adopt and utilise new technology in both direct and indirect ways. The majority of prior studies have underscored the substantial, beneficial influence of PE and the intention to utilise smart services (Dickinger, Arami, & Meyer, 2008; Igbaria, Schiffman, & Wieckowski, 1994; Kabadayi et al., 2019; Park et al., 2018; Ramayah & Ignatius, 2005; Yang et al., 2017). (Sara Abhari) Accepted on August 12, 2022.

The significance of perceived delight in the adoption of technology, particularly in the context of smart voice assistants. The literature indicates that consumers' attitudes and behaviours towards technology are significantly influenced by hedonistic aspects, such as perceived enjoyment. The intrinsic reward or delight that is derived from the use of technology is referred to as perceived enjoyment. In the context of smart voice assistants, consumers' perceptions of the use of smart speakers as enjoyable, entertaining, and thrilling are reflected in their perceived enjoyment. Users may be captivated by the prospect of engaging in activities or enjoyable conversations with the device or AI smart voice assistant. The excerpt implies that a positive emotional relationship

with a smart voice assistant can be established by experiencing pleasure, satisfaction, and joy while using the device. Based on these concepts, this positive emotional connection serves as the foundation for an enduring and favourable relationship with the smart voice assistant. The excerpt introduces a hypothesis regarding the beneficial influence of perceived enjoyment on the adoption and acceptance of the smart voice assistant (Simone Aiolfi Department of Economics and Management, Universita degli Studi di Parma, Parma, Italy).

The literature indicates that consumers' attitudes and behaviours towards technology adoption are significantly influenced by hedonistic aspects, including perceived enjoyment, in the context of the relationship between perceived enjoyment and attitudes towards smart voice assistants. The intrinsic incentive that individuals derive from utilising technology is referred to as perceived enjoyment. In the context of smart voice assistants, perceived enjoyment is a reflection of how consumers perceive the use of smart voice assistants as enjoyable, entertaining, thrilling, and enjoyable during their customer journey. The interactive capabilities of smart voice assistants, such as the ability to engage in activities or entertaining conversations and converse with the device or AI smart voice assistant, can captivate users. A positive emotional relationship with a smart voice assistant can be established by experiencing delight, satisfaction, and enjoyment while using the device. This positive emotive connection serves as the foundation for a long-lasting and positive relationship with intelligent voice assistants. The significance of perceived delight in the formation of attitudes towards intelligent voice assistants. A positive emotional relationship and an overall attitude towards the device are influenced by the fact that individuals find the use of a smart voice assistant to be pleasurable. (Università degli Studi di Parma, Parma, Italy, Simone Aiolfi Department of Economics and Management).

4.1.2 Perceived value

Perceived value is the comprehensive evaluation that consumers make of the utility of a product or service. It is predicated on their subjective assessments of the benefits they receive and the contributions they make (Zeithaml, 1988). Customers frequently consult with others and depend on feedback prior to making purchasing decisions. The value that customers perceive can fluctuate depending on their interactions with providers and the perceived social value of the products or services. An indirect effect of anthropomorphism on perceived value has been demonstrated in a previous study, despite the fact that the direct relationship between anthropomorphism and perceived value has not been completely understood. This investigation concentrated on the influence of anthropomorphic signals on social engagement in the context of tourism social media, specifically through social responses (Perez-Vega et al., 2018).Anthropomorphism facilitates the establishment of human-like relationships between customers and intelligent voice assistants. Smart speakers can establish active and intimate connections by emulating interpersonal relationships. The utility derived from the products or services is one of the benefits that these active relationships provide consumers (Wanjiku et al., 2020). In the context of this study, the positive benefits derived from the anthropomorphic nature of voice shopping are inferred to be the source of customers' perceived value of smart voice assistant services. October 30, 2022, Yu-Teng Jacky Jang, Anne Yenching Liu, and Wen-Yu Ke.

Smart voice assistants are highly valued for their ability to simplify a substantial amount of information, thereby guiding users to the items that align with their preferences and requirements. Recommender systems are a significant category of artificial intelligence. These systems are frequently employed to extract consumer information and assist in the preparation of marketing decisions (Balabanovic and Shoham, 1997). Technologies that are based on artificial intelligence and interaction, known as recommender systems, offer suggestions for products that may be of interest or utility to the user (Mahmoud and Ritchie, 2009; Resnick and Varian, 1997). Recommender systems

have been implemented in numerous domains, including music, movies, news, and products in general (Reddy et al., 2019). In order to facilitate the decision-making process for customers, numerous organisations, including LinkedIn, Netflix, Spotify, and Amazon, are implementing recommender systems (Schrage, 2021). For more than two decades, Amazon has used collaborative filtering algorithms in its recommendation systems (Smith and Linden, 2017). Amazon displays recommendations for new arrivals in previously favored categories (Reddy et al., 2019). Amazon's recommendation mechanisms work such that users' interests are identified based on their browsing history and relevant products of various shapes, sizes, and brands are recommended (Smith and Linden, 2017). Despite positive statements about the importance of recommender systems for Amazon, the use of recommender systems has reported a very low return on investment. Recommender systems only account for 35% of Amazon sales (Janak and Gojovac, 2019). According to reports, about half of potential sales are lost; Customers feel overloaded with choices and disappointed with the online purchasing experience. (Nirmal Acharya, Anne-Marie Sassenberg and Jeffrey Soar 2022.(

Smart voice assistant agent devices enable individuals to ask questions as if the device were a human and asked it to perform specific tasks. Interaction and control of these devices is done by users through natural language conversations. Smartphones are identified applications as mobile learning technology and contribute to student learning. These applications can assist in the recording of student responses to exam or attendance questions, as well as in the evaluation of students' progress in a course. These applications broaden the scope of conventional distance and online education by enabling learners to acquire languages through interaction with smartphone applications. Smartphone applications serve as powerful e-learning tools and delight students by assisting them in achieving the intended learning objectives of online courses. This is also beneficial for students, as smart voice assistant agents such as Alexa serve as coaches to instruct individuals in public speaking and communication. Studies have shown that students in regions where the language of instruction is English but the local language is a different language exhibit positive satisfaction with these assistants. Numerous studies are currently underway to investigate the utilisation of artificial intelligence personal assistants, with an emphasis on user satisfaction. User ratings are the source of information that these assistants acquire and retain. Interaction with AI smart voice assistants has been the subject of research as a primary method for predicting customer satisfaction or the discrepancy between user expectations and user experience. This concept has been expanded to the educational environment, where students are taught using AI personal assistants to ensure active learning. The laboratory instruments are effortlessly managed by the intelligent assistant actively supporting them. According to a research study, user satisfaction is partially influenced by the implementation of artificial intelligence-powered voice assistants such as Alexa. There is a dearth of research on the application of artificial intelligence smart voice assistants in the classroom, despite the abundance of literature on the subject. The value of a voice-activated intelligent assistant device in the learning classroom will stimulate behavioral responses in students, which can lead to either satisfaction or dissatisfaction. There is a gap in the context of AI smart voice assistants that we would like to explore by looking at the learning aspect using Bandura's social cognitive theory, the value of the voice-activated intelligent assistant device through Sheath et al.'s theory of consumption values, and the satisfaction aspect using Oliver's expectancy confirmation theory. This scope allows us to make distinct hypotheses, which we present in the next section. (Maarif Sohail 2020(.

Consumer behavior and the adoption of information technology are significantly influenced by perceived value and purchase intention. Prior studies have demonstrated a favorable correlation between the adoption of e-commerce and other digital services and perceived value and purchase intention. The range of activities potential customers perform when looking for, assessing, buying, utilizing, and discarding a good

or service is referred to as consumer behavior. Purchase intention is the term used to describe how much money a client plans to spend on a product or service. In specialty retail, behavioral intention—which is impacted by consumers' purchasing experiences—is frequently employed as a gauge of e-commerce adoption success.

It has been discovered that behavioral intention is positively impacted by customer satisfaction. For instance, it has been demonstrated that customer satisfaction affects customers' inclination to use the service when it comes to SMS usage. Similar to this, people are more inclined to use smart voice assistants for voice shopping if they are happy with their voice shopping experiences. Thus, it is conceivable that behavioral intention is positively impacted by pleasure with voice purchasing through smart voice assistants. Customers' thorough evaluation of a product or service's usefulness based on what they get and provide in return is known as perceived value. Before making a purchase, customers frequently ask for other people's thoughts and recommendations. A product or service's perceived value can change based on how consumers engage with its suppliers and how valuable it is in society. Prior studies have demonstrated an indirect impact of anthropomorphism on perceived value in the setting of social media, even if the direct relationship between anthropomorphism and perceived value has not been fully investigated. Customers and smart voice assistants can develop human-like connections thanks to anthropomorphism, which can result in intimate and dynamic interactions. Customers gain from these interactions in a number of ways, including product utility benefits. Thus, it is possible to postulate that anthropomorphism influences perceived value favorably when using a smart voice assistant for voice purchases. (Jang Yu-Teng, Liu Anne Yenching, Ke Wen-Yu 30 Oct 2022).

4.1.3 Perceived convenience

A smart voice assistant refers to the use of human-like features and interactions to enhance the convenience of searching for products or services. Convenience is an important aspect of the shopping experience, and it is categorized into various factors such as access, search, evaluation, relevance, and temporal effects. Smart voice assistant can have a positive impact on the convenience of transactions, especially in the context of augmented reality (AR) technologies in retail environments. In this study, the focus is on customers' perceptions of the convenience of using smart voice assistants to search for items while shopping. When customers engage in smart voice assistants, they rely on utilitarian goals and navigational strategies, searching for products on the Internet. Makes browsing unnecessary information easier. Thanks to advances in big data analysis, machine learning, and natural language processing, smart voice assistants can now filter out unnecessary content and customize search results depending on user preferences. This makes them more useful to customers. Anthropomorphism allows users to quickly and easily search for the goods and services they want with smart voice assistants. The shopping experience is made more convenient and tailored to the needs and interests of each individual customer thanks to this technology. (Annie Yenching Liu, Wen-Yu Ke, and Yu-Teng Jacky Jang, October 30, 2022).

With its array of features, including decision-making, voice, text, and image recognition, and integration with autonomous vehicles and robotics, smart voice assistant applications have gained significant traction in the marketing industry (Jarek and Mazurek, 2019). Smart voice assistants have shown to be advantageous in a number of ways, particularly in the field of marketing. They make it possible to employ text mining to glean insights from online word-of-mouth, model direct marketing replies using evolutionary programming, use classification trees to anticipate client attrition, and automatically modify websites to better suit user demands (Overgoor et al., 2019). Deshpande (2019) provides a summary of nine strategies for using conversational smart voice assistants in marketing, together with paid advertisements, audience segmentation, sales forecasting, dynamic pricing, personalized content, predictive analytics, and

recommendation engines. Due to its versatility, smart voice assistant technology has found application in marketing. Personalization is a marketing strategy that leverages consumer data and automatic machine selection to select products, prices, website content, and advertising messages based on prior actions of specific customers (Kumar et al., 2019; Deng et al., 2019). According to Stephen and Ahmad (2017), these applications offer a personalized touch and are thought to be a successful means of preserving solid customer relationships. Prediction and adaptability provide an additional crucial role. According to Stephen and Ahmad (2017) and Siau and Yang (2017), smart voice assistants possess the ability to anticipate demand, identify client attrition, and adjust in real-time to particular marketing strategies and consumer circumstances. They accomplish this by using cognitive technologies like computer vision, image recognition, and natural language processing for decision-making applications (Jarek and Mazurek, 2019). By using technologies like chatbots and virtual assistants, which can comprehend spoken words or phrases and are available around-the-clock, smart voice assistants also significantly contribute to interaction and engagement (Jarek and Mazurek, 2019). These voice-assisted AI systems are becoming more and more integrated into the customer journey and experience in marketing, sales support, customer services, and product information (Conversational Systems Market worth $17.4bn by 2024; 28 Brands That Use smart voice assistant to Enhance Marketing).

The widespread use of smart voice assistants by consumers and marketers necessitates thorough research on how they affect the marketing process. According to Overgoor et al. (2019), Wierenga (2010), Campbell et al. (2020), and other experts, marketers can benefit from smart voice assistants by increasing marketing efficiency, getting useful information and insights, and automating repetitive processes. This frees up time for marketers to concentrate on strategy and creativity. According to Jarek and Mazurek (2019), smart voice assistants enhance brand value and foster stronger customer-brand relationships by offering users timeless services and recommendation systems that make life easier for them. According to research on consumer adoption of smart voice assistant technology, media, social norms, and attitudes all have an impact on consumers' decisions to use voice assistants (Gursoy et al., 2019; Belanche et al., 2019). Studies have also looked into the consequences of smart voice assistant applications, including how anthropomorphism affects consumer perception and how customer purchase rates are affected by chatbots for smart voice assistants (Kim et al., 2019; Luo et al., 2020). Furthermore, eye-tracking studies have shown that people react more strongly to unexpected scenarios involving robots and smart voice assistants (Ene, 2018). While earlier research has touched on a variety of voice assistant applications in marketing, studies on smart voice assistant applications in marketing communication have mostly concentrated on using smart voice assistants to support personalized communications that build relationships between brands and consumers. (Huan Chen, Julia Kim, Slyvia Chan-Olmsted, and Irene Mayor Sanabria College of Journalism and Communications, University of Florida, Gainsville, Florida, USA). The Technology Acceptance Model (TAM) has found successful application in various domains, such as mobile commerce and online transactions (e.g., Luceri et al., 2022). TAM is a robust model that examines the relationship between users' attitudes and their perceived ease of use, with extensive research on this causal link (Davis et al., 1989, p. 320). The term "perceived ease of use" (PEOU) describes people's perception of how simple it is to utilize a specific technology. It acts as a gauge for the mental strain involved in picking up and using new technology. PEOU measures how easy people think smart voice assistants are to use, understand, and learn about. This information is relevant to the adoption of these gadgets. Venkatesh et al. (2012) claim that technology that is easy to use requires less effort to operate. People will adopt a positive attitude toward an innovation if they don't think using it will be excessively tough and think it will make a certain task easier. In the case of smart voice assistants, some consumers find the option to use verbal commands instead of a traditional keypad to be easier and quicker (Kessler and Martin, 2017; Zaharia and Würfel, 2020). (Department

of Economics and Management, Università degli Studi di Parma, Parma, Italy).

4.1.4 Perceived security

The rapid adoption of smart services is still in its infancy phase, with some diffusion, despite the positive influence (Mashal & Shuhaiber, 2018). ICTs have significantly altered the manner in which users and technology interact with devices as a result of the swiftly expanding internet usage (Mani & Chouk, 2017). In contrast to conventional services, smart services pose some significant risks, such as fraud, data hacking, and phishing, in addition to the comfort and vivid advantages they provide (Eggert, 2019). This is due to the fact that consumers permit the service provider to access their personal information. Additionally, smart services appear to be hazardous in certain respects when the customer permits the service to be controlled, which may be causing the customer to experience discomfort and anxiety regarding the service operator's access to their data (Kabadayi et al., 2019). Customers'. Nevertheless, a small number of studies have examined the potential impact of functional barriers on consumers' intentions to employ smart services. Customers who are reluctant to disclose their confidential information to service providers are particularly concerned about security, as per Kabadayiet al. (2019). PS was defined by Kalakota and Whinston (1997) as the customer's assessment of the protection levels against data abuse, fraud, and disclosure. Nevertheless, a number of significant risks, such as system hijacking and security threats, must be taken into account and eliminated by the new services in light of the rapid increasing demand for smart technology. The primary reason for these hazards is that customers are frequently permitted to establish connections through multiple network sources (Sara Abharin). Accepted on August 12, 2022.

The influence of perceived privacy risk on consumers' perceptions and behaviours regarding digital voice assistants. Perceived privacy risk is the perceived hazard to an individual's privacy that arises from the collection of information by technology that is beyond their knowledge and control. that consumers' attitudes and behaviours are adversely affected by the perceived privacy risk. This incorporates privacy invasion and concerns regarding the improper acquisition, use, and storage of personal information. Shopping attitudes and behaviours may be affected by these concerns. In the context of a smart voice assistant, individuals typically grant the devices extensive permissions and information to execute complex commands. Nevertheless, there are risks associated with clever voice assistants, including vulnerabilities and hacker attacks. Some of these vulnerabilities include the absence of access control based on physical presence, the inadequate security of applications from third-party developers, and the use of one-factor authentication. The passage also addresses the difficulties associated with perusing privacy policies for smart voice assistants, as the voice interface makes it difficult to do so directly. Furthermore, there is a dearth of oversight and safeguarding by organisations and businesses. The adoption of technology is negatively predicted by perceived privacy risk, which is a result of the uncertainty surrounding the privacy implications of smart voice assistants. If users perceive the operations of a smart voice assistant as manipulative and have concerns about privacy invasion, these concerns outweigh the potential benefits in terms of relevance, resulting in a negative attitude towards the smart voice assistant. The passage presents a hypothesis regarding the impact of perceived privacy risk on the attitude towards smart voice assistants, as a result of these discussions. (Simone Aiolfi) Accepted on March 29, 2023

The level of security that is involved in the online transmission of sensitive information is referred to as network security. The anonymity of individuals is at risk due to the online transmission of information through voice shopping. The primary concerns are the possibility that voice shopping device companies may monitor voice communications and that third parties may exploit personal data that is transmitted online. The most significant factor contributing to risk concerns in smart devices was identified as privacy (Klobas et al., 2019). In order to mitigate privacy concerns, organisations must

safeguard and secure their users' private information (Zheng et al., 2018). In order to establish a secure shopping environment for consumers, it is imperative to mitigate the risk of disclosing online transaction data to unauthorised parties. Perceived security is the subjective likelihood of personal information being disclosed and retained by third parties as perceived by clients (Shehata et al., 2021). In the context of communicating with virtual assistants such as Apple Siri and Google Assistant on mobile devices, anthropomorphism has a substantial impact on user privacy concerns, as demonstrated by a previous study (Ha et al., 2021). In a previous study on the development of virtual relationships, it was also contended that individuals may experience feelings of security and comfort when virtual agents are perceived as anthropomorphic (Yu-Teng Jacky Jang Accepted 30 October 2022).

4.2 Attitude towards using smart voice assistant

The significance of attitudes in assessing an individual's possessions or circumstances. Attitudes are long-term, thorough assessments that represent an individual's positive or negative appraisal of an activity or object. Customizing behavioral modification treatments according to significant traits of consumer groups can augment the efficacy of target behaviors. Consumer expectations regarding the results of utilizing technology impact consumers' trust in intelligent agents, underscoring the need to regulate these expectations in order to augment reliance on smart voice assistant recommendations. In order to comprehend consumer attitudes toward smart voice assistants, it is imperative to profile consumers based on their opinions regarding particular products, such as Amazon's Alexa, Google Assistant, Apple's Siri, and Apple's Ping. This study attempts to fill a knowledge vacuum by examining the relationship between speech recognition and attitudes regarding smart voice assistants, which has not been the subject of much empirical research. A deeper comprehension of user behavior and purchase intent in relation to smart services, like speech recognition, can be achieved by analyzing belief components and attitudes. This highlights the significance of attitudes in assessing different facets of people, objects, or circumstances. It draws attention to the necessity of taking into account customer perceptions of particular smart voice assistant products as well as the connection between speech recognition and smart voice assistant perceptions. Understanding these attitudes can provide insights into regulating user behavior and purchasing intent in the context of smart services. (H.A. Dimuthu Maduranga Arachchi Individual Researcher, Colombo, Sri Lanka, and G. Dinesh Samarasinghe Department of Industrial Management, University of Moratuwa, Moratuwa, Sri Lanka).

The present study examines the notions of attitude towards new technology and intention to use it, with a particular focus on smart voice assistants. Attitude is defined as an individual's positive or negative assessment or appraisal of a behavior. In the context of technology adoption, attitude represents a person's psychological disposition towards using that technology. Attitude towards new technology is a critical factor in predicting consumers' intention to use it in the future. Behavioral intention is a stated likelihood of engaging in a behavior.

The passage underscores the importance of attitude and intention to use in consumer behavior research, especially concerning new technology like smart voice assistants. It highlights that a positive attitude towards a technology boosts the likelihood of its future use, while intention to use reflects the initial adoption phase of the technology. (Simone Aiolfi, Department of Economics and Management, Universitas degli Studi di Parma, Parma, Italy).

4.3 Intention to use smart voice assistant

The focus of the second field of research has been on factors connected to users that affect customers' propensity to adopt smart devices. These elements include user vulnerability (Lee, 2020), technical resistance (Chouk and Mani, 2019; Hong et al.,

2020; Mani and Chouk, 2019), and technological preparedness (Mulcahy et al., 2019). For instance, people's readiness for technology, which is based on risk, trust, and engagement, may have an impact on their desire to use smart home gadgets (Mulcahy et al., 2019). Privacy concerns and reluctance to smart home goods stem from user vulnerability and technology experience (Lee, 2020). Perceived risk related to intangible services and confusing technology may impede adoption intentions (Hong et al., 2020). (Hong and others, 2020). (Crystal T. Lee and Sara H. Hsieh, 2021).

Customers' purchase experiences have a big impact on their behavioural intentions, and if they had a good experience, they are much more likely to use an e-service (Udo et al., 2010). Furthermore, an earlier study showed the positive impact of customer satisfaction on behavioral intention. For instance, customer satisfaction was found to positively influence their behavioral intention of adoption in a study that looked at the use of short message services (SMS) (Lai, 2004). A smart voice assistant can be used to access voice shopping, an online service. Consequently, if customers have a great voice buying experience, they are more likely to employ speech shopping with a smart voice assistant. (Wen-Yu Ke, Anne Yenching Liu, and Yu-Teng Jacky Jang, 2022).

Two of the most thoroughly studied ideas in consumer behavior are attitude toward new technology and intention to use it. These ideas are essential for forecasting people's choices or actions (Ajzen, 1991; Fishbein and Ajzen, 1977; Hwang et al., 2019). "The extent to which an individual has a positive or negative assessment or evaluation of the behavior" is how Ajzen (1991, p. 188) defines attitude. In the context of technology adoption, attitude refers to an individual's psychological predisposition to react either favorably or unfavorably to a particular technological behavior (Hew et al., 2016; Hwang et al., 2019). Several theoretical and empirical research, including Ajzen (1991), Davis et al. (1989), and Fishbein and Ajzen (1977), show that attitude plays a significant role in deciding one's intention to adopt new technology. Consumers that have a positive attitude about a new technology are more likely to use it in the future (Hew et al., 2016; Hwang et al., 2019). Behavioural intention, according to Oliver et al. (1997, p. 28), is the stated likelihood of engaging in a specific behaviour. For people who are embracing new technologies for the first time, "intention to use/adopt" is used. The phrase describes a metric for the degree of deliberate effort people make to engage in the particular behavior of embracing new technology (Fishbein and Ajzen, 1977; Davis .et al., 1989). Simone Aiolfi, 2023

5. Methodology:

This study aims to investigate customer attitude towards smart voice assistant driven by smart assistant and their intention to use them. Data for the present study were collected in 2024, using a questionnaire passed to a purposive sample of (254) individuals from the city of Cairo (Egypt) have responded the questionnaire. The questionnaire consisted of four sections. The first three sections included questions and items related to perception, attitude toward using smart voice assistant and intention to use smart voice assistant. These three sections used a Likert-Scale ranging between "Strongly agree" (5) and "Strongly disagree" (1). Finally, the fourth section included demographic questions about gender, age, income, education, and general information contained two questions, with yes or no answers, as follows: Do you know what smart voice assistant are? And do you use them?

The SPSS software will be used to organize and explain the responses. The data will be analyzed in SPSS using techniques such as frequency analysis, reliability testing, descriptive statistics and multiple regression analysis. The hypothesis outcomes will then be uncovered based on the analysis findings.

The research is trying to investigate how customer investigating the effect of perception and customers attitude towards smart voice assistant and their intention to use them.

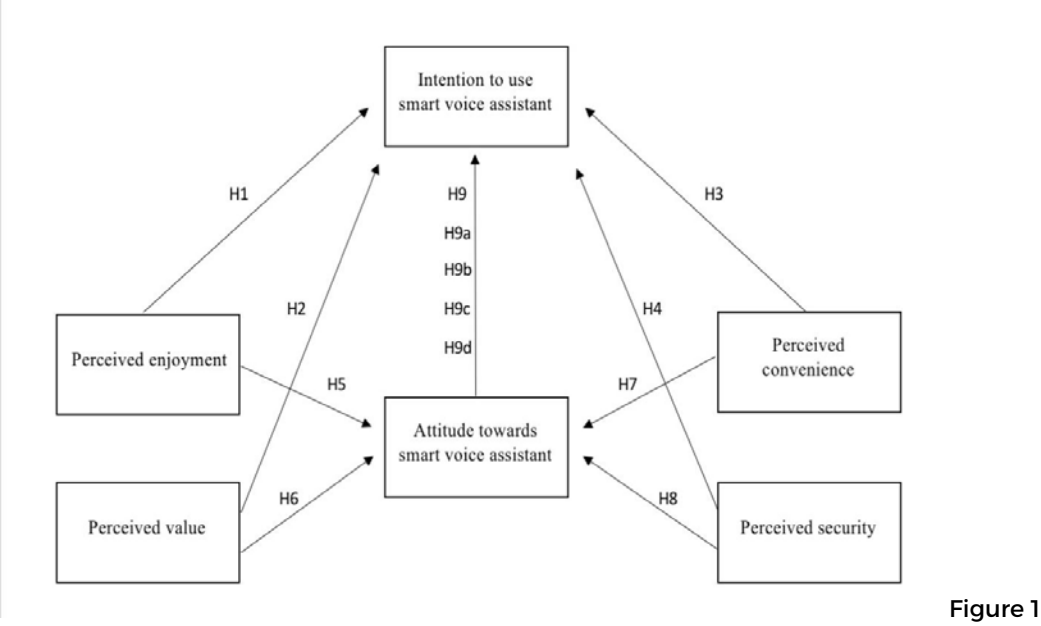

Figure 1

Research hypotheses

H1: Perceived enjoyment of smart voice assistant has a significant effect on the intention to use smart voice assistant.

H2: Perceived value of smart voice assistant has a significant effect on the intention to use smart voice assistant.

H3: Perceived convenience of smart voice assistant has a significant effect on the intention to use smart voice assistant.

H4: Perceived security of smart voice assistant has a significant effect on the intention to use smart voice assistant.

H5: Perceived enjoyment of smart voice assistant has a significant effect on the attitude to use smart voice assistant.

H6: Perceived value of smart voice assistant has a significant effect on the attitude to use smart voice assistant.

H7: Perceived convenience of smart voice assistant has a significant effect on the attitude to use smart voice assistant.

H8: Perceived security of smart voice assistant has a significant effect on the attitude to use smart voice assistant.

H9: The attitude toward using smart voice assistant has a significant effect on the intention to use smart voice assistant.

H9a: Perceived enjoyment of smart voice assistant has a significant effect on the intention to use smart voice assistant mediating by attitude.

H9b: Perceived value of smart voice assistant has a significant effect on the intention to use smart voice assistant mediating by attitude.

H9c: Perceived convenience of smart voice assistant has a significant effect on the intention to use smart voice assistant mediating by attitude.

H9d: Perceived security of smart voice assistant has a significant effect on the intention to use smart voice assistant mediating by attitude.

6 .Results:

According to the descriptive analysis for demographic variables, the results indicate that the majority of the sample is females with (64%), while males account for only (36%). As for the age, the results indicate that the age of the majority is 18-25 (67.7%) followed by those ranging between 25-35 with (14.2%). Moreover, the analysis showed that the majority have income less than or equal 5000 (53.9%), followed by those whose income is ranging between (5000-10000) per month with (18.1%). Finally, concerning educational background, the majority are college students (63.4%) followed by others with (16.5%).

Regarding the general information about the smart speaker voice assistant, the bar charts show that 94.4% know what the smart voice assistant is and 84.52% use them

Alpha Cronbach's (A measure of reliability) for the items in the questionnaire: The outcome shows that the range of the Cronbach's Alpha value is (0.8 - 0.9). Furthermore, the primary purpose of Cronbach's alpha is to evaluate the internal consistency of a questionnaire composed of several Likert-type scales and items. According to established wisdom, a Cronbach's alpha score of 0.6–0.7 indicates an adequate degree of reliability, whereas 0.8 or more indicates an extremely good level.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Perceived enjoyment	249	1.00	5.00	3.5522	.99534
Perceived value	251	1.00	5.00	3.6773	1.01450
Perceived convenience	242	1.00	5.00	3.7580	.96520
Perceived security	248	1.00	5.00	3.4647	.98471
Attitude	248	1.00	5.00	3.6579	.97715
Intention	243	1.00	5.00	3.7443	.91521
Valid N (listwise)	224				

Table 2: Reliability analysis

Constructs	number of items	Cronbach`s Alpha
Perception	18	0.921
Perceived enjoyment	4	0.917
Perceived value	3	0.908
Perceived convenience	7	0.952
Perceived security	4	0.811
Attitude	6	0.924
Intention	7	0.930

Table 3: Sample perception of perceived enjoyment

Items	Strongly Disagree	Dis-agree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation	Rank
I think it's fun to use smart speakers voice assistant for voice shopping	12	20	73	86	62	3.6561	1.07844	1
The process of using a smart speakers voice assistant for voice shopping makes me very happy	16	24	87	71	55	3.4941	1.12200	4
I enjoy the process of using smart speakers voice assistant for voice shopping	17	21	77	84	53	3.5357	1.11612	2
Smart speakers voice assistant gives me a feeling of excitement	17	22	80	79	55	3.5257	1.12526	3
Weighted Mean	**3.5529**							
Weighted Standard Deviation	**1.110455**							

Table (3) shows descriptive statistics for perceived enjoyment, from which we find that the highest average was awarded to the first statement of the section " I think it's fun to use smart speakers voice assistant for voice shopping " with mean 3.6561 and standard deviation of 1.07844, followed by " I enjoy the process of using smart speakers voice assistant for voice shopping " and then " Smart speakers voice assistant gives me a feeling of excitement" The mean of this section is 3.5529.

Table 4: Sample perception of perceived value

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation	Rank
I think it's worth using a smart speakers voice assistant for voice shopping	12	25	67	87	62	3.6403	1.09882	2
The use of smart speakers voice assistant offers good value	15	12	63	91	70	3.7530	1.09670	3
The use of smart speakers voice assistant is beneficial to me	18	13	69	90	63	3.6601	1.12117	1
Weighted Mean	**3.684467**							
Weighted Standard Deviation	**1.105563**							

Table (4) shows descriptive statistics for perceived value, from which we find that the highest average was awarded to the second statement of the section " The use of smart speakers voice assistant offers good value " with mean 3.7530 and standard deviation of 1.09670, followed by " The use of smart speakers voice assistant is beneficial to me " and then " I think it's worth using a smart speakers voice assistant for voice shopping" The mean of this section is 3.6844.

Table 5: Sample perception of perceived convenience

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation	Rank
It is more convenient for me to complete tasks just with a voice command	**15**	**19**	**61**	**85**	**72**	3.7143	1.13515	6
I can automate some of my routine tasks using my smart speakers voice assistant	**15**	**11**	**51**	**104**	**68**	3.7992	1.07756	3
I like the ability of my smart speakers voice assistant to save my time and effort in doing things	**14**	**13**	**59**	**85**	**81**	3.8175	1.11062	2
Smart speakers voice assistant allows multi-tasking	**15**	**10**	**62**	**96**	**66**	3.7550	1.07774	4
Smart speakers voice assistant shopping is easy to understand and navigate	**19**	**13**	**66**	**84**	**69**	3.6813	1.15326	7
A smart speaker's voice assistant can help me find what I'm looking for quickly	**14**	**4**	**53**	**96**	**85**	3.9286	1.05376	1
Using my smart speakers voice assistant is a convenient way to manage my time	**10**	**19**	**68**	**85**	**69**	3.7331	1.106792	5
Weighted Mean	**3.728571**							
Weighted Standard Deviation	**1.092429**							

Table (5) shows descriptive statistics for perceived convenience, from which we find that the highest average was awarded to the sixth statement of the section " A smart speaker's voice assistant can help me find what I'm looking for quickly " with mean 3.92 and standard deviation of 1.053, followed by " I like the ability of my smart speakers voice assistant to save my time and effort in doing things " and then " I can automate some of my routine tasks using my smart speakers voice assistant" The mean of this section is 3.728571.

Table 6: Sample perception of perceived security

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation	Rank
I think smart speakers voice assistant is safe	21	22	69	75	65	3.5595	1.20111	3
Smart speakers voice assistant will be manipulated	14	22	78	73	63	3.5960	1.12331	1
Can smart speakers voice assistant misuse my stored information	17	28	71	63	72	3.5777	1.20538	2
I think smart speakers voice assistant it's safe for smart speakers to hear my sensitive messages	42	42	61	49	56	3.1400	1.38567	4
Weighted Mean	**3.4625**							
Weighted Standard Deviation	**1.2287**							

Table (6) shows descriptive statistics for perceived security, from which we find that the highest average was awarded to the second statement of the section " Smart speakers voice assistant will be manipulated " with mean 3.59 and standard deviation of 1.123, followed by " Can smart speakers voice assistant misuse my stored information " and then " I think smart speakers voice assistant is safe" The mean of this section is 3.4625.

Table 7: Sample perception of attitude

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation	Rank
I like using smart speakers voice assistant based voice assistants	21	17	65	77	70	3.6320	1.19930	4
I feel good about using smart speakers voice assistant based voice assistants	14	17	69	79	70	3.6988	1.11877	2
Interactions with my smart speakers voice assistant range over a wide variety of topics	13	16	74	79	68	3.6920	1.09633	3
I can freely talk with smart speakers voice assistant	19	25	67	73	67	3.5737	1.19898	5
Smart speakers voice assistant responses like a human	18	27	69	74	62	3.5400	1.18237	6
Smart speakers voice assistant immediately response through voice when I ask anything	12	13	65	87	73	3.7840	1.07235	1
Weighted Mean	**3.6500**							
Weighted Standard Deviation	**1.13833**							

Table (7) shows descriptive statistics for attitude, from which we find that the highest average was awarded to the second statement of the section " I feel good about using smart speakers voice assistant based voice assistants " with mean 3.69 and standard deviation of 1.118, followed by " Interactions with my smart speakers voice assistant range over a wide variety of topics " and then " I like using smart speakers voice assistant based voice assistants" The mean of this section is 3.6500.

Table 8: Sample perception of intention

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation	Rank
I want to spend more time with my smart speakers voice assistant	21	32	64	67	66	3.5000	1.24265	7
I intend to use my smart speakers voice assistant frequently for a long period of time	17	18	71	80	63	3.6185	1.14080	6
Interaction with the smart speakers voice assistant personal assistant does not require a lot of my mental effort	13	11	59	95	71	3.8032	1.06513	3
I find the smart speakers voice assistant personal assistant to be easy to use	8	10	56	105	71	3.8840	97279.	1
My interaction with the smart speakers voice assistant is clear and understandable	9	12	66	94	67	3.7984	1.00991	5
I plan to continue using a smart speakers voice assistant in the future	9	16	54	104	65	3.8065	1.01549	2
In the future I will recommend my friends to use a smart speakers voice assistant	13	18	55	84	80	3.8000	1.12296	4
Weighted Mean	3.740							
Weighted Standard Deviation	1.26058							

Table (8) shows descriptive statistics for perception intention, from which we find that the highest average was awarded to the fourth statement of the section " I find the smart speakers voice assistant personal assistant to be easy to use " with mean 3.88 and standard deviation of 0.97, followed by " I plan to continue using a smart speakers voice assistant in the future " and then " Interaction with the smart speakers voice assistant personal assistant does not require a lot of my mental effort" The mean of this section is 3.740.

Table 9: Pearson Correlation between the independent and mediator variables and smart speakers' intention

Correlations							
		Perceived enjoyment	Perceived Value	Perceived Convenience	Perceived Security	Attitude	Intention
Perceived enjoyment	Pearson Correlation	1		.734**	.539**	.629**	.604**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	249	247	239	244	244	239
Perceived Value	Pearson Correlation	.823**	1	.876**	.592**	.696**	.683**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	247	251	240	246	246	241

Perceived Convenience	Pearson Correlation	.734**	.876**	1	.677**	.748**	.695**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	239	240	242	239	238	233
Perceived Security	Pearson Correlation	.539**	.592**	.677**	1	.783**	.621**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	244	246	239	248	245	240
Attitude	Pearson Correlation	.629**	.696**	.748**	.783**	1	.824**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	244	246	238	245	248	241
Intention	Pearson Correlation	.604**	.683**	.695**	.621**	.824**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	239	241	233	240	241	243

**. Correlation is significant at the 0.01 level (2-tailed).

According to table (9), the results of Pearson Correlation between the independent variables (perceived enjoyment, perceived value, perceived convenience and perceived security) mediator (attitude) and dependent variable (intention) indicated that there is a strong and moderate positive relationship between them.

Table 10: regression analysis of perception dimensions on intention

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.741[a]	.548	.540	.61683

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	102.109	4	25.527	67.093	.000[b]
	Residual	84.086	221	.380		
	Total	186.195	225			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
B		Std. Error	Beta		T	Sig.
1	(Constant)	.952	.176		5.422	.000
	Perceived Enjoyment	.096	.072	.104	1.339	.182
	Perceived Value	.293	.100	.322	2.940	.004
	Perceived Convenience	.161	.094	.173	2.705	.000
	Perceived Security	.216	.056	.234	3.834	.000

In order to test the hypotheses, regression analysis was needed. First, the Adjusted R-square is 0.540 and it indicates that 54 % of the discrepancy in intention was been considerably explained by perception dimensions.

Then, according to the results of table (10), based on the ANOVA table, it is found that the significance level is 0.000 (p = .000), that is less than 0.05. Since that the p value is 0.000 < 0.05, thus it shows that the independent variables can, to a good extent, impact intention, which

is the dependent variable. Table 10 shows that perceived value, Perceived convenience and Perceived security have positive significant impact on intention since the p-value is less than 0.05. Hence, H2: Perceived value of smart voice assistant has significant effect on the intention to use smart voice assistant, H3: Perceived convenience of smart voice assistant has significant effect on the intention to use smart voice assistant and H4: Perceived security of smart voice assistant has significant effect on the intention to use smart voice assistant, are accepted. While, the results also show that Perceived enjoyment has insignificant impact on intention, so, H1: Perceived enjoyment of smart voice assistant has significant effect on the intention to use smart voice assistant is rejected.

Table 11: regression analysis of perception dimensions on attitude

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.843a	.711	.705	.53306

ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	157.615	4	39.404	138.671	.000
Residual	64.219	226	.284		
Total	221.834	230			

Coefficients						
Model	Unstandardized Coefficients			Standardized Coefficients	T	Sig.
	B	Std. Error	Beta			
	(Constant)	.257	.151		1.706	.089
	Perceived Enjoyment	.088	.062	.088	1.420	.157
	Perceived Value	.190	.086	.192	2.216	.028
	Perceived Convenience	.183	.081	.181	2.251	.025
	Perceived Security	.491	.049	.490	10.063	.000

In order to test the hypotheses, regression analysis was needed. First, the Adjusted R-square is 0.705 and it indicates that .5 % of the discrepancy in attitude has been considerably explained by perception dimensions.

Then, according to the results of table (11), based on the ANOVA table, it is found that the significance level is 0.000 (p = .000), that is less than 0.05. Since that the p value is 0.000 < 0.05, thus it shows that the independent variables can, to a good extent, impact attitude, which is the dependent variable. Table 11 shows that perception has a positive significant impact on intention since the p-value is less than 0.05. Hence, H6: Perceived value of smart voice assistant has significant effect on the attitude to use smart voice assistant, H7: Perceived convenience of smart voice assistant has significant effect on the attitude to use smart voice assistant and H8: Perceived security of smart voice assistant has significant effect on the attitude to use smart voice assistant are accepted. While the results also show that perceived enjoyment has insignificant impact on attitude, so, H5: Perceived enjoyment of smart voice assistant has

significant effect on the attitude to use smart voice assistant is rejected.

Table 12: regression analysis of attitude on intention

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.824[a]	.680	.678	.52055

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	137.351	1	137.351	506.887	.000[b]
	Residual	64.762	239	.271		
	Total	202.113	240			

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients		
B		Std. Error	Beta		T	Sig.
1	(Constant)	.943	.129		7.307	.000
	Attitude	.767	.034	.824	22.514	.000

In order to test the hypotheses, regression analysis was needed. First, the Adjusted R-square is 0.678 and it indicates that 67.8 % of the discrepancy in intention has been considerably explained by attitude.

Then, according to the results of table (12), based on the ANOVA table, it is found that the significance level is 0.000 (p = .000), that is less than 0.05. Since that the p value is 0.000 < 0.05, thus it shows that the independent variable can, to a good extent, impact intention, which is the dependent variable. Table 12 shows that attitude has positive significant impact on intention since the p-value is less than 0.05. Hence, H9: The attitude toward using smart voice assistant has significant effect on the intention to use smart voice assistant is accepted.

Table 13: indirect relationships (mediation effect)

	Hypothesis	Sample (Mean (M	Standard Deviation ((STDEV	T-Statistic (|O/ (|STDEV	P values	mediation / no mediation
H9a	Perceived enjoyment →attitude → intention	0.1359	0.0430	3.1652	0.0018	mediation
H9b	Perceived value →attitude → intention	0.1940	0.0443	5.5433	0.000	Mediation
H9c	Perceived convenience →attitude → intention	0.1709	0.0597	5.5659	0.0012	Mediation
H9d	Perceived security→ attitude → intention	-0.0531	0.0544	-0.9746	0.3308	No mediation

As shown in Table 13, it ensures the mediation of attitude in the relationships between perceptions dimensions (enjoyment, values, convenience, and security) and intention. Hence, H4: Perception has significant effect on the intention to use smart voice assistant mediating by attitude, H4a: Perceived enjoyment of smart voice assistant has significant effect on the intention to use smart voice assistant mediating by attitude, H4b: Perceived value of smart voice assistant has significant effect on the intention to use smart voice assistant mediating by attitude, H4c: Perceived convenience of smart voice assistant has significant effect on the intention to use smart voice assistant mediating by attitude and H4d: Perceived security of smart voice assistant

has significant effect on the intention to use smart voice assistant mediating by attitude are accepted.

7. Discussion

The results indicate that users derive more enjoyment from using smart voice assistant with more humanlike traits (e.g., appropriate tone and phrasing) and more positive behavioral traits (e.g., politeness and helpfulness). These factors also increase the positive attitude toward smart voice assistant use. These results correspond with the study of (Rouibah et al., 2021).

in addition, the article by Yu-Teng Jacky Jang highlights the positive correlation between perceived convenience in voice shopping via smart speakers and customers' purchase intention. Convenience, defined by factors like time, money, and effort, is crucial in the shopping context, particularly regarding product variety and purchase frequency. During the browsing and search phases of voice shopping, elements such as system design, search functionality, and product organization influence perceived convenience. Voice shopping through smart speakers enables customers to shop using voice commands, which is confirmed with our results.

In contrast, the study of Yılmaz and Rızvanoğlu (2022) contradicts this perspective. They emphasize integration as a key factor affecting service quality (SQ). Similarly, Yılmaz and Rızvanoğlu (2022) research indicates that iPhone users express concerns about the integration success of virtual assistants, specifically Siri.

Moreover, the results underscore the significance of perceived security in driving the adoption of voice shopping, as it positively influences user satisfaction and intention to embrace this technology. It emphasizes the importance of safeguarding personal information and transaction security, given the uncertainties surrounding privacy in the voice shopping environment. The study of Yılmaz and Rızvanoğlu (2022) supports these findings, highlighting information retrieval as the primary reason for users to engage with virtual assistants (Vas), with accuracy and reliability being crucial considerations. Privacy and security concerns, including those related to data collection practices, impact users' trust in Vas, as revealed by the PwC survey in 2018. Also, the study of Jang and Liu (2022) confirms these findings, affirming that perceived security positively affects user satisfaction and adoption intention in voice shopping. It stresses the importance of protecting personal information to establish trust and satisfaction in smart speaker voice shopping.

8. Implications

For customer providing hands-free operation for things like playing music, setting reminders, and managing smart home devices, smart voice assistants provide convenience. By incorporating these gadgets into their daily life, customers can anticipate a streamlining of their regular duties and routines.

For Managers should highlight the unique value proposition of intelligent smart voice assistants, including: Hands-free operation, personalized experience, and integration with other smart devices. Clearly communicating these benefits increases perceived value and increases adoption managers need to ensure that intelligent smart voice assistants are seamlessly integrated into users' daily routines and tasks, making it easy to perform common activities such as setting reminders, checking the weather, and controlling smart home devices Increase convenience by recognizing user needs and providing intuitive solutions.

For Marketers Enable voice commands for accessing marketing analytics data. Marketers can ask questions like "Hey Google, what were the website traffic numbers for last week?" or "Alexa, how many leads did we generate from the latest campaign?"

This allows marketers to quickly obtain important insights without manually analyzing data. Marketers can retrieve customer information, update contact details, and add notes using voice commands. For instance, “Hey Google, add a note to the customer profile about their marketing campaign preferences.” Enable voice commands to manage email marketing campaigns. Marketers can ask smart voice assistants to create and send emails, check open rates, and track email campaign performance.

9. Limitations and future research:

In this study there are several research limitations. Firstly, the survey data were primarily collected from college students, potentially skewing the results towards a younger perspective on voice assistants. The majority of the sample fell within the 18-25 age range, aligning with Generation Z demographics. One of the noted limitations is the ongoing challenge for smart voice assistants to accurately understand natural language commands, particularly in noisy environments or with dialects, leading to user frustration and errors. Additionally, privacy concerns arise from the continuous listening and potential storage of user voice data, potentially deterring users due to fears of data misuse or surveillance. Dependence on internet connectivity poses another limitation, particularly in areas with limited or unreliable internet access.

Future studies could address these limitations by focusing on experienced users to reflect real customer behavior, expanding the scope to investigate the relationship between attitude and continued use intention, and conducting comparative studies in different contexts. While this study provided valuable insights into the perception of smart voice assistant, future research could delve into developing more robust speech recognition algorithms, leveraging advancements in deep learning and natural language processing to improve accuracy, especially in challenging environments. Efforts to enhance privacy and security should include mechanisms for user-controlled data deletion. Research should also explore techniques to enhance contextual understanding and conversational capabilities, enabling more natural and relevant interactions, as well as improving offline functionality for better accessibility in diverse environments. By addressing these limitations and exploring new research avenues, future smart voice assistant systems can be more accurate, privacy-conscious, contextually aware, and personalized, ultimately enhancing user satisfaction and usability across various domains and applications.

10. Conclusion and Recommendation

This research investigates the effect of perception and customers’ attitudes towards using smart voice assistant. It is anticipated that smart voice assistants integrated into smart home devices will emerge as leading players in future markets. The study found that perception enhances customers’ perceived enjoyment, value, convenience, security, and satisfaction, thereby influencing their inclination to utilize voice shopping through smart voice assistant. Unlike previous research that primarily focused on product features or shopping experiences, this study offers insights into how the perception characteristics of smart voice assistant impact customers’ adoption of voice shopping. Moreover, companies developing smart voice assistant can use these findings to enhance their voice shopping capabilities. Leveraging smart voice assistant to enhance enjoyment, value, convenience, and security is crucial for attracting more customers to voice shopping, The emergence of smart voice assistants is fueled by a confluence of technological advances, such as machine learning, artificial intelligence, and natural language processing, which have given these virtual assistants the ability to understand, interpret, and interact with human speech intelligently and with amazing accuracy. Through this skill, smart voice assistants have gone beyond simple tools to become reliable partners that help people complete tasks, obtain information, and

deal with the challenges of modern life with unparalleled efficiency and ease.

This study investigates customer attitudes towards smart voice assistant driven by smart assistants and their intention to use them. The data collected from 254 individuals in Cairo, Egypt, revealed significant findings. The majority of respondents were female (64%) and aged between 18-25 (67.7%). Most participants had an income of less than or equal to 5000 Egyptian pounds per month (53.9%) and were college students (63.4%). Descriptive statistics indicated high levels of awareness and usage of smart speaker voice assistants.

The reliability analysis showed strong internal consistency among questionnaire items, with Cronbach's Alpha values ranging from 0.8 to 0.9. Descriptive statistics for perceived enjoyment, value, convenience, security, attitude, and intention demonstrated positive perceptions overall, Regression analyses confirmed that perception significantly influenced the intention to use smart voice assistant, with perceived value, convenience, and security playing crucial roles. Attitude towards using smart voice assistant also had a significant impact on intention, Furthermore, perception significantly influenced attitude, with perceived value, convenience, and security positively influencing attitude. However, perceived enjoyment did not significantly impact attitude, Mediation analysis revealed that attitude mediated the relationships between perception dimensions (enjoyment, value, convenience, and security) and intention to use smart voice assistant. Overall, the findings support the importance of perceived value, convenience, security, and attitude in influencing the intention to use smart voice assistant. These insights can inform marketing strategies and product development efforts in the smart voice assistant industry.

At the end, ensuring the security of a smart voice assistant is crucial to protect both user privacy and prevent unauthorized access to sensitive information. Here are some recommendations for improving the security of a smart voice assistant: Security is an ongoing process, and it's essential to stay vigilant and keep up with the latest security practices and technologies to protect voice assistant systems effectively.

To encourage and motivate customers to interact with the smart voice assistant on a frequent basis, incorporate gamification features and incentive programmers. Incentives, accolades, or accomplishments can enhance the fun and engagement of interactions, which can result in a more positive attitude towards technology.

Enhance the ability of smart voice assistants to accurately understand and interpret natural language commands, even in noisy environments or with diverse dialects. Develop smart voice assistants with improved offline functionality to perform basic tasks and provide responses even without an internet connection, increasing accessibility in areas with limited connectivity.

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