Analysis Of User Acceptance Of Digital Voice Acceptance

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Abstract
This conceptual paper delves into the complexities surrounding user acceptance of digital voice assistants, exploring theoretical frameworks and potential influencing factors. Rooted in the Technology Acceptance Model (TAM) and related theories, it investigates the underlying mechanisms driving users' intentions to adopt and engage with digital voice assistants. Through an examination of variables such as perceived usefulness, perceived ease of use, trust, and social influence, the paper aims to construct a holistic understanding of the determinants shaping user acceptance. Furthermore, methodological approaches for studying user acceptance, including surveys, interviews, and usability testing, are discussed to provide insights into best practices for empirical research in this field. By synthesizing existing literature and theoretical perspectives, this paper contributes to the development of a conceptual framework for comprehending user acceptance of digital voice assistants. It sets the stage for future empirical investigations and offers valuable guidance for the design and implementation of voice-based technologies.

I. Introduction

Digital intelligent assistants (DIAs) often referred to simply as intelligent assistants or virtual assistants are sophisticated software applications designed to perform various tasks and provide information to users through voice commands or text input (Rubin et al., 2010). These assistants utilize artificial intelligence (AI) and natural language processing (NLP) to understand and respond to user queries effectively. DIAs assistants have become an integral part of modern life. Forbes Insight survey of 700 C-suit executives indicated that 86% of companies that adopt AI for providing better customer services utilize chatbots for customer service (Alger, 2018).

One of the key features of these assistants is their ability to adapt and learn from user interactions, continuously improving their performance and providing increasingly personalized experiences. Major tech companies like Apple with Siri, Amazon with Alexa, Google with Google Assistant, and Microsoft with Cortana have all developed their own versions of digital intelligent assistants, each with its own set of capabilities and integrations with other services and devices. As technology continues to advance, we can expect digital intelligent assistants to become even more intuitive, proactive, and seamlessly integrated into our daily routines, ultimately enhancing productivity and convenience for users across various domains. The implications of digital intelligent assistants are vast and multifaceted, permeating numerous aspects of daily life and society. These assistants have the potential to revolutionize how individuals interact with technology, offering unprecedented convenience and efficiency. In the realm of accessibility, they provide invaluable support to individuals (Moriuchi, E., 2019). There are evidences provided by previous studies for acceptance of digital voice assistant in educaton and health field (Abdullah et al., 2018; Laranjo et al., 2018; Tegos et al., 2016; Vaidyam et al., 2019), or amongst specific populations, such as children, patients, and the elderly (Macedonia et al., 2014; Ring et al., 2015). Moreover, digital intelligent assistants hold promise in healthcare, where they can assist medical professionals in accessing patient information, scheduling appointments, and even providing basic medical advice. In education, these assistants can serve as personalized tutors, offering tailored learning experiences and adaptive feedback to students. Future growth of conversational assistants is very promising (Brandtzaeg & Følstad, 2018). However, along with their benefits, digital intelligent assistants raise concerns regarding privacy and data security, as they often require access to personal information to perform their tasks effectively. Furthermore, there are ethical considerations surrounding the use of AI in decision-making processes, particularly in sensitive domains such as law enforcement or finance. As these technologies continue to evolve, it is essential to address these implications thoughtfully and proactively to ensure that the benefits of digital intelligent assistants are maximized while minimizing potential risks. Gartner (2020) predicted that by 2022, 70% of customer interactions would involve emerging technologies such as ML

applications, chatbots and mobile messaging, up from 15% in 2018. Digital voice assistants have become a prominent fixture in India, fundamentally altering how individuals engage with technology and access information. With the widespread proliferation of smartphones and the steady rise in internet usage, platforms like Google Assistant, Amazon Alexa, and Apple's Siri have seamlessly integrated into the daily routines of many Indians. These assistants cater to a myriad of needs, ranging from furnishing weather forecasts and setting reminders to aiding in language translations and managing smart home devices. Notably, in a country as linguistically diverse as India, these assistants offer support for multiple Indian languages, thereby enhancing accessibility and inclusivity across different regions and linguistic communities. This linguistic inclusivity has been pivotal in narrowing the digital divide and empowering users from various cultural backgrounds. Furthermore, digital voice assistants are increasingly being assimilated into key sectors such as e-commerce, banking, and healthcare, delivering tailored and convenient services to consumers. Nonetheless, challenges like dialectal variations and accent recognition persist, necessitating ongoing refinement and localization efforts to bolster accuracy and user satisfaction. As India continues its trajectory of digital evolution, digital voice assistants are poised to assume an ever more central role in shaping the landscape of technology and communication in the country. Utilization of DVAs is increasing in number. It is required to analyze its advantage on the society.

II. Literature Review

There are multiple theories available which are discussing about the acceptance of the technology. One of the famous theories for the same is "Technology Acceptance Model". TAM is given by Davis, 1986. There are two main variables which are explaining the acceptance behavior. The Technology Acceptance Model (TAM) stands as a pivotal theoretical construct utilized to elucidate and anticipate individuals' embracement and integration of novel technologies. TAM posits that the "perceived utility" and "perceived simplicity" of use serve as the primary determinants shaping an individual's inclination toward utilizing a specific technology, subsequently influencing their actual engagement with it. "Perceived utility denotes the extent to which an individual believes that employing a given technology will bolster their efficiency or effectiveness", whereas "perceived simplicity of use pertains to the degree to which a person views the technology as straightforward to operate". According to TAM, if individuals perceive a technology as both beneficial and user-friendly, they are more inclined to incorporate it into their routines. TAM has found extensive application across diverse domains and technologies, ranging from enterprise software to consumer electronics, consistently demonstrating its efficacy in comprehending user behavior. Moreover, subsequent iterations of TAM, such as TAM2 (Venkatesh, V., & Davis, F. D., 2000) and TAM3(Venkatesh & Bala 2008), have expanded upon the model by incorporating additional variables like social influence and facilitating conditions. Overall, TAM furnishes valuable insights into the drivers behind technology adoption, empowering researchers and practitioners to design more intuitive and efficacious technologies that align closely with users' preferences and requirements. Perceived usefulness and perceived ease of use are two needed constructs for assessing acceptance behavior of the users. These two constructs have significant impact on attitude of the users to use chatbots (Zarouali et al., 2018). The extension of the TAM theory also gave subjective norms, computer playfulness and perceived enjoyment (Yang, H., et al., 2019) which seems relevant with the adoption of DVAs. There are studies available which done in-depth work in having knowledge about factors affecting the same (Ling, E. C et al., 2021). Subjective norms have significant impact on adoption of personal assistants (McLean, G., & Osei-Frimpong, K., 2019a).

The widespread adoption of DVAs underscores a fundamental shift in the way humans interact with technology, highlighting an increasing acceptance and incorporation of advanced innovations into everyday routines. With a mindset characterized by receptiveness and inquisitiveness, people are embracing these assistants as invaluable tools that streamline tasks, boost efficiency, and deliver tailored support. This favorable disposition arises from the acknowledgment of the substantial benefits DVAs offer, ranging from simplifying mundane activities such as scheduling and home automation to facilitating hands-free internet searches. Furthermore, the adaptability and continuous refinement of these assistants, coupled with their capacity to tailor responses to individual preferences and learn from user interactions, contribute to their widespread appeal. As society continues to embrace the seamless integration of technology into various aspects of life, the attitude toward embracing digital voice assistants reflects a collective yearning for convenience, productivity, and interconnectedness in an ever-evolving digital landscape. The attitude construct significantly influences the adoption of DVAs. Attitude encompasses individuals' beliefs, feelings, and behaviors towards a particular technology, impacting their readiness to engage with it. In the context of digital voice assistants, a positive attitude often correlates with perceptions of usefulness, ease of use, and enjoyment of the technology. Attitude and behavioral intention to use facebook chatbot has significant impact (Zarouali et al., 2018). Users who view digital voice assistants as valuable tools for simplifying tasks, boosting productivity, or offering entertainment are more inclined to adopt them. Furthermore, favorable attitudes are nurtured by positive user experiences, social influence, and perceived compatibility with existing habits and values. Conversely, negative attitudes

arising from concerns about privacy, security, or doubts about the technology's capabilities can impede adoption. Hence, comprehending and addressing users' attitudes are crucial for fostering widespread acceptance and utilization of digital voice assistants across various domains. There are studies available which indicated that positive attitude transformed into behavioral intention to use adoption of DVAs (Lee and Choi, 2017). Users are not satisfied with website service, usually turned towards live chat service (McLean and Osei-Frimpong, 2019b). Personal innovativeness also has needed impact on adoption of DVAs (Richad et al., 2019). Hedonic motivation also has positive needed impact on perceived usefulness and attitude which in turn have significant impact on behavioral intention (Gursoy et al., 2019). There is another theory which explains adoption behavior. Unified theory of acceptance and use of technology (UTAUT) provided holistic explanation for the same. Performance expectancy and effort expectancy constructs are provided by UTAUT, taken in place of perceived usefulness and perceived ease of use given by TAM.

III.   Research Methodology

This review paper serves as the foundation for developing a conceptual framework that outlines key influencing factors such as perceived usefulness, ease of use, social influence, and trust. The methodology begins with an extensive literature review, where existing studies on digital voice assistants and established theories of technology adoption are critically examined. Through this review, key factors influencing adoption, such as perceived usefulness, ease of use, social influence, and trust, are identified and synthesized into a conceptual framework. Hypotheses may still be formulated to guide theoretical exploration and argumentation within the paper, although they are not tested against empirical data. The methodology focuses on conceptual analysis and theoretical development, utilizing existing knowledge to construct a coherent narrative around the factors affecting digital voice assistant adoption. This methodological approach allows for a deep understanding of the theoretical underpinnings of adoption dynamics, providing valuable insights for theory development and practical applications.

Theoretical Framework of Digital Voice Assistant

As per above discussion, theoretical framework is develop which includes various factors affecting adoption of DVAs.

IV.   Discussion

The adoption of digital voice assistants represents a dynamic and multifaceted process influenced by a myriad of factors. Through the synthesis of existing literature, this conceptual paper has identified several key factors that play pivotal roles in shaping individuals' decisions to adopt digital voice assistants. One of the primary factors highlighted in the literature is perceived usefulness. Users are more likely to embrace digital voice assistants if they perceive them as valuable tools that simplify tasks, enhance productivity, or provide entertainment. This perception is often influenced by the functionality and capabilities of the voice assistant, as well as the extent to which it meets users' specific needs and preferences. Ease of use emerges as another critical determinant of adoption. Individuals are more inclined to adopt digital voice assistants if they find them intuitive and easy to interact with. The adoption of digital voice assistants is influenced by various factors, including performance expectancy and effort expectancy, as identified in the literature. Users are more likely to adopt these assistants if they perceive them as capable of delivering satisfactory performance outcomes, such as simplifying tasks, improving efficiency, or enhancing entertainment experiences. Moreover, effort expectancy, which refers to the perceived ease of use and convenience associated with interacting with the technology, plays a crucial role. Intuitive interfaces, seamless interactions, and minimal cognitive effort required for task completion positively impact adoption intentions. Social influence further shapes attitudes, with recommendations from trusted sources facilitating adoption, while privacy and security concerns can act as barriers. Individual traits like technology readiness and prior experience also influence adoption behaviors.

Factors such as user interface design, responsiveness, and natural language processing capabilities significantly impact users' perceptions of ease of use. Moreover, social influence plays a significant role in shaping attitudes and adoption intentions. The influence of peers, family members, and social networks can either facilitate or hinder the adoption of digital voice assistants. Positive recommendations and endorsements from trusted sources can enhance users' perceptions of the technology, while negative experiences or perceptions shared within social circles can deter adoption. Additionally, individual characteristics such as innovativeness, and prior experience with similar technologies shape adoption behaviors. Users who are early adopters or have a high tolerance for technological complexity may be more willing to experiment with digital voice assistants, while others may exhibit greater resistance due to lack of familiarity or comfort with such technologies.

V.   Conclusion

In conclusion, this conceptual paper sheds light on various factors influencing the adoption of digital voice assistants. Through an exploration of factors such as perceived usefulness, ease of use, social influence, performance expectancy, hedonic motivation, perceived enjoyment, personal innovativeness and effort expectancy, it becomes evident that attitudes play a crucial role in shaping users' adoption behaviors. Recognizing the significance of these factors provides valuable insights for stakeholders, including developers, marketers, and policymakers, to design and implement strategies that promote the widespread acceptance and integration of digital voice assistants into everyday life. However, this conceptual paper is not without its limitations. Firstly, the scope of factors discussed may not encompass the entirety of influences affecting adoption, as the landscape of technology adoption is multifaceted and constantly evolving. Additionally, the paper primarily focuses on theoretical frameworks and may benefit from empirical validation through studies examining real-world adoption behaviors. Moreover, the generalizability of findings may be limited by contextual factors such as cultural differences and technological infrastructure. Despite these limitations, this paper serves as a foundational framework for further research and practical initiatives aimed at facilitating the seamless integration of digital voice assistants into society.

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