

Studying Customer Utility of Artificial Intelligence Assistants via Technology Acceptance Model

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Artificial intelligence (AI) assistants have become an inseparable component of society due to their usefulness, efficiency, and affordability resulting in an increased demand on them. While there are various AI assistants in the market, the four frontrunners in the AI assistant industry are Amazon (Alexa), Apple (Siri), Google (Google Assistant), and Microsoft (Cortana). Despite their benefits, ramifications may evolve as they expose their user's privacy to potential danger.

This paper studies the potential dangers encountered by AI users as well as the reasons driving the demand for AI through the Technology Acceptance Model (TAM). The variables studied herein are efficiency, affordability, usefulness, trustworthiness, ease of use, risk, and trendiness. From TAM, consumers are drawn to AI assistant products due to perceived efficiency and usefulness. For the sake of this study, perceived affordability and perceived potential risks were added to the model as each factor plays a role in the consumer's decision to adopt these products (Boonsiritomachai & Pitchayadejanant, 2017).

Keywords: Artificial Intelligence (AI) Assistants, risks, demand

LITERATURE REVIEW

The escalating progress in modern living style implores the consumers to invest in the newest digital trends to remain relevant to the ever-changing living circumstances. In fact, it has currently been apparent in many domains that the base of their operations is heavily reliant on technology and data analyzing (Hausmann and Domiguez, 2022). For instance, the fields of education, medicine, airplanes, cars and government cannot operate without the application of technology and artificial intelligence (Wolff, J., 2021). Due to the increase in the amount of information and data humans are privy to, it became a necessity to find different managing systems that are technology-based to store the multiplying information, in which case artificial intelligence was found to be the most suitable solution for such tasks (Boonsiritomaachai & Pitchayadejanant 2017).

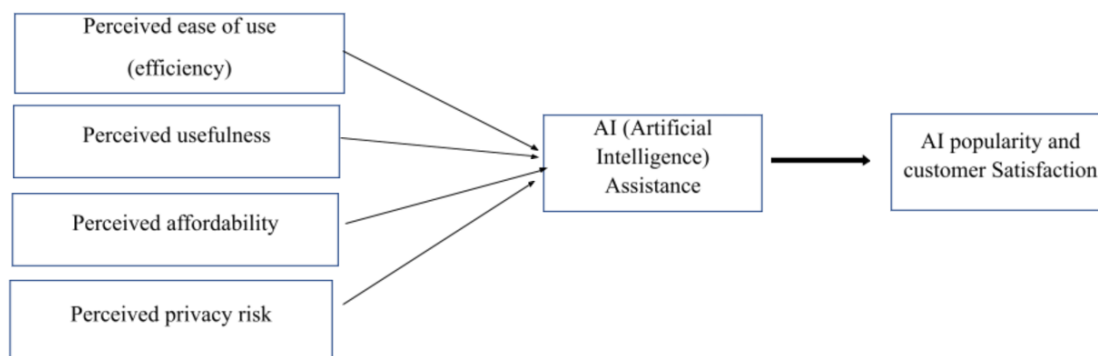
Artificial Intelligence (AI) is defined as a system developed to execute humanly tasks related to reasoning, analyzing, and problem solving in a more efficient and faster manner (Copeland, 2022). It has been proven that AI is able to efficiently execute tasks faster than humans with a minimum marginal error. Hence, it is widespread in the world for both industrial and personal uses. The everyday consumer has been influenced by the over advertisement of AI products and its ubiquitous presence in every platform, that it easily made its way into many households. Among the many AI products that became a staple item in households include but are not limited to voice assistants such as Google, Siri, Cortana, smartphones, smart

home products, smartwatches and smart doorbells. While AI has been beneficial to many due to the efficient services it offers for humans, it has also been labeled as a “blessing in disguise” due to its many downsides (Bushnell, 2018). According to recent research done about the effects of AI, “the impact of artificial intelligence on human society and bioethics”, the author mentioned that AI has negative impacts such as being the main cause of unemployment, causing social distance between people, causing wealth inequalities as well as developing its own algorithms beyond its human controller, which will affect many vulnerable users’ information (Cheng-Tek Tai, 2020). Therefore, the importance of recognizing the cons of AI is imperative given the many possible ramifications that can be caused once users become heavily reliant on different versions of AI in their daily lives.

METHODS

This study implemented a survey to collect information from AI users regarding why they owned an AI device and how they viewed these devices in terms of efficiency and safety. The survey was also used to gather additional patterns that users experienced when using an AI or when purchasing an AI device. The results were analyzed to understand reasoning behind owning an AI device, usage patterns and reflections on their overall experiences. The survey was given to users from the ages of 17-30 years old, in which the total number of participants was 83. The study also used the Technology Acceptance Model (TAM) to analyze the user’s decisions and attitudes towards AI. (See Figure 1).

**FIGURE 1
RESEARCH MODEL**



RESEARCH QUESTIONS

The following three questions were the core questions for this research: the first question asked why people made the decision to invest in voice assistant devices. The second question addressed in this study was whether people could live without AI, and if not, how they were able to execute their daily tasks before this invention. Finally, the third question was regarding if users were aware of the ramification of voice assistant devices, and if they were, what their plan was to avoid potential danger.

PARTICIPANTS

The survey was distributed to the students in one of the MISY 1013 sections in Prairie View A&M University (PVAMU), which is classified as one of the Historically Black Universities (HBCU) in the United States. A total of 83 students from Prairie View, Texas completed and returned the survey questionnaire. Among the participants 47.6% were female and %52.4 were male all of which ranged within

the 17-30 age group. The race identified in the study was 90.36% African American, 6% of the participants identified as Hispanic or Latino and 3.61% identified as other.

MEASURES

This study used the Survey for a pool of students in one of the MISY sections within the Information Technology department at PVAMU. The items were designed to obtain information related to understanding reasons behind AI's popularity, usage, whether its users were aware of its ramifications and shortcomings and how prepared users were in an event a security breach took place.

DATA ANALYSIS

The data from the survey was collected using a google spreadsheet. Each data point was converted to percentages to gain a better perspective on AI users' opinions and behaviors towards their AI devices. The data was also used to indicate the direction of which the majority of participants were leaning towards for each question.

RESULTS

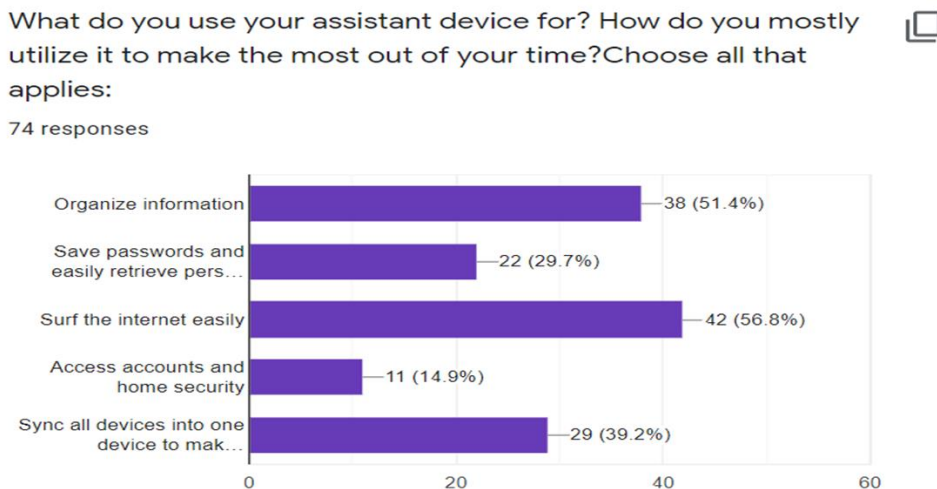
After analyzing the answers of the 83 participants, the following were the main patterns concluded. 79.5% of the participants owned an AI device whereas 16.9% of the participants neither owned an AI device nor did they think they needed it. Interestingly, 3.6% of the participants did not own one but were thinking of buying one. The percentages of those who owned an AI answered the following when addressing the three core questions of this study. For question 1, which asked them about the reason why they decided to own an IA device, 90% of the answers were that the AIs came with their devices for free. However, 3% answered that it was a gift, and 7% answered that AIs are very useful and efficient. For question 2, asking if the participants thought that daily functions were still easily doable without an assistant device, 84.1% of the participants answered yes while 15.9% answered no. Finally, for question 3, which asked why individuals made the decision to invest in voice assistant devices, the following variables were part of the multiple choices included in this question to see which one or more were the motive behind the consumer's decision to invest in AI or voice assistants (efficiency, affordability, usefulness, trustworthiness, ease of use, trendiness, and less risks) (see Figure 2).

FIGURE 2
PARTICIPANTS' ANSWERS TO RESEARCH QUESTION 3



For question 4, which asked participants about what they used their assistant device or AI for as well as how they utilized it to make the most out of it, the following figure (Figure 3) demonstrates their responses.

FIGURE 3
PARTICIPANTS' ANSWERS TO RESEARCH QUESTION 4



From the previous data collected, usefulness, efficiency and ease of use were the main reasons why AIs were used. Around 45% of the participants were at risk from getting hacked because they relied on their AIs to save sensitive information such as passwords and account log-ins. 10% of the participants noted that their AI devices were hacked at least once. Further, only 16.9% of the participants feel prepared to face a hacking problem within their AI devices.

FINDINGS

Based on the survey, the majority of the participants owned an AI because it came with their mobile devices. Further, the majority of the participants claimed its usefulness but are also underprepared to face any potential risks. 45% of the participants declared that they utilize their AI to remember passwords and account information, which makes them prone to potential hacking efforts. In fact, 10% of the 83 participants' AI devices have been hacked. Only 16% of participants felt prepared to face potential hacking problems.

To conclude, this generation's excitement to try new things is leading Artificial Intelligence to the forefront of technology given its many uses and affordability. However, the safety and trustworthiness of AI are becoming an alarming issue that many users are prone to facing especially if they were not prepared nor trained to face hacking attempts such as some of the participants in this study.

FUTURE CONSIDERATIONS

The focus of this study was understanding the reasoning behind the spread of using AI and how prepared the users are for facing its potential negative impacts. Further, this micro study was designed to shine the light on potential risks caused by voice assistants that are overlooked by consumers who are driven to purchase items for excitement, trendiness and ease of use. Moreover, this paper calls for consumers' consciousness when making decisions in regard to investing in smart devices or any future AI device sold in the market. Future research would include ways to help consumers protect themselves against any security breaches, hacking efforts or AI malfunctions that might jeopardize their personal information or

their passwords (Zeng, Zhu, Chi, Du, Guizani, 2019). Also integrate more related issues such as The Internet of Things (IoT), Phishing (Trautman et al 2020 & 2021), Climate, Cyber Risk, and Technology Employment, Information and Communication in the Digital Age (Hussein et al 2020, 2021&2022).

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