

“A Study on "Consumer Attitude towards Digital Voice Assistants”

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Abstract:- Usage of digital voice assistants is increasing rapidly among consumers around the world, in 2020, 4.2 billion digital voice assistants were being used and they are projected to grow to 8.4 billion units by 2024. Looking to the rapid usage of voice assistants it is crucial to analyze consumers attitude and preferences towards it.

Digital voice assistants are highly complex and voice enabled artificial intelligence based technologies. Consumers use digital voice assistants to perform a series of tasks such as making call, online shopping, listening to music, etc.

This article critically examines the frequency of usage of virtual assistants across different age groups. We analyzed that younger user, used the voice assistants more frequently and they used voice assistants for a variety of tasks. On the other hand, elder people relied less on these assistants and used it rarely.

Also, we analyzed gender-based differences in awareness of consumers regarding virtual assistants and learning rate of consumers of different age group.

In this study, 120 survey responses from a variety of consumers were analyzed. Customers attitude was measured using sampling method.

So we have decided to study consumers attitude towards digital voice assistants and various factors which influence consumers attitude. The population of the study is students and faculties of lovely professional university, phagwara. The sample size is 120(60 males and 60 females) and we have used sampling method for the study.

Our findings indicate that males have higher awareness rate as compared to females, and younger people found it easy to use voice assistants on their own. On the other hand, elderly people felt the need of a technical person to use voice assistants.

The research also found that various factors such as Accuracy, Confidentiality, Functionality and Ads free greatly influence consumers attitude towards voice assistants. We analyzed the consumers preference towards these factors.

It is expected that this study will help marketers to better understand consumers attitude about voice assistants and they can build better relations with consumers.

I. INTRODUCTION

The field of artificial intelligence (AI) research has made great strides in recent years, all newly developed technologies are closely related to the AI. Thus, AI is seen as the next big thing that will change the world forever. Voice assistants are one such type of voice enabled artificial intelligence, which are the second fastest growing consumer technology after smartphones. As a result, voice assistants are revolutionizing consumer behavior. (Simms, 2019)

Presently “Siri”, “Alexa”, “Google assistant” and “Cortana” are the most popular digital voice assistants and are being widely embraced by consumers as these virtual assistants are offered by market leaders (Google, Apple, Amazon and Microsoft) and provide a wide range of benefits to its consumers. These technologies provide highly personalized content to its used on a real time basis and are more reliable and convenient. (Baier, Reese, & Roglinger, 2018)

Digital voice assistants are advance artificial intelligence technologies, still the use of voice assistants varies from one user to another. (Kuar et al. ,2016). Consumers can use voice assistants to perform basic personal tasks (e.g., text message, phone call, listening to music, set alarm) as well as for advanced functions (e.g., monitoring health)

Consumer behavior is greatly influenced by their attitudes. Therefore, it is crucial to understand consumer attitudes. Consumer researcher measure attitudes by asking questions or by making inferences from consumers behavior. In a consumer behavior context, an attitude is a learned predisposition to behave in a consistently favorable or unfavorable way with respect to a given object (Schiffman & Kanuk, 2004).

Consumers and businesses are rapidly adopting Siri, Alexa and other digital assistants.

Digital assistants and other artificial intelligence technology can be used to transform businesses by automating complex jobs (online shopping, ordering food) and enhancing customer service. This has resulted in higher productivity in business. However, there is scant empirical support for customers finding digital assistants to be satisfactory.

II. LITERATURE REVIEW

(M. Bhuvaneshwari, 2022) This study explores the rise in customer acceptance of digital assistants like Siri, Alexa, and Cortana as well as how they have the potential to upend industries by increasing productivity and automating processes. However, there isn't much empirical data on consumer satisfaction with digital assistants, and they have some drawbacks like possible privacy issues and calculation errors. The Expectations Confirmation Theory was used in the study's analysis of 122 consumer poll answers to determine how satisfied customers were with digital assistants. The research provided managers with insights to better understand the factors that influence customer satisfaction with digital helpers by emphasizing the significance of building user confidence and resolving information privacy concerns. The research emphasizes the significance of giving high-importance customer satisfaction areas that call for performance enhancements top priority.

Customer satisfaction has become a focus, this study ensures that the consumers expectations and confirmation contribute to evaluate customer satisfaction. In addition, it provides insights the importance of building a strong perception of user trust while addressing user concerns about privacy. These factors can affect customer satisfaction ratings.

(Thomas M. Brill, Laura Munoz & Richard J. Miller, 2019) Customer satisfaction with digital assistants like Siri, Alexa, Google Assistant, and Cortana is the main emphasis of this research. It emphasizes how little empirical data there is on consumer satisfaction with digital assistants, and the study seeks to close this knowledge deficit. The research examines 244 poll answers and bases its findings on the Expectations Confirmation Theory in order to comprehend the factors that influence and the level of customer happiness with digital assistants. The findings support the notion that consumer satisfaction with digital assistants is positively and significantly correlated with hopes and confirmation of expectations. The research indicates that firms must help consumers correctly identify what to anticipate from the interactive experience in order to meet their expectations and offers insights that enable managers to prioritize marketing and management activities. The study emphasizes the significance of building solid user perceptions of trust while addressing user concerns about information privacy, which might affect user assessments of customer satisfaction.

(ARTIN ESMAILZADEH & MAGNUS ROLANDSSON, 2020) Launched in 2010, Siri was the first successful voice assistant, and a lot of people considered this as beginning of a new era in technology. since 2019, businesses started to integrate voice assistants across different devices. In voice commerce, language assistants are primarily used to find information and evaluate alternatives early in the consumer purchasing process. These results ultimately translate into management impact for key stakeholders in the business. Additionally, early adopters of the technology valued purchasing a voice assistant more than average voice assistant users.

We found that user frequency for a particular activity is primarily based on context and convenience. In voice commerce, voice assistants are primarily used to perform information retrieval and evaluate alternatives in the early stages of the consumer buying process. Voicebot.ai (2019) claims that the number of smart speaker owners in the US increased by 40% in 2018 to 66.4 million, representing 26.2% of US residents.

(Komal sharma, 2020) The study paper examines the growing e-commerce trend in India as a result of widespread Internet access. The study looks at the variables affecting consumer attitudes regarding online buying and the challenges that consumers face when purchasing online. The study recruited 60 respondents from various Indian states and using a practical sampling technique. According to the research, factors like easy access, prompt delivery, safe and secure payment methods, a wide selection of products that are available, a system for handling complaints, and simple return and replacement procedures all have a positive impact on consumers' attitudes towards online shopping. Contrarily, obstacles including apprehension about disclosing credit card information, subpar goods, falsified product reviews, and disappointing purchases have a negative impact on customer sentiments regarding online buying. According to the report, this knowledge can assist Indian internet businesses in developing stronger bonds with customers and formulating effective e-commerce strategies. The study comes to the conclusion that although customers prefer online shopping for a variety of reasons, including savings and a large selection of products, manual shopping is still the preferred method for everyday purchases. The majority of respondents are content with internet purchasing overall.

(Asheesh Trivedi & Adarsh Sachan, 2020) This descriptive study examines and analyzes consumer attitudes towards tobacco in Kanpur. Clients' attitudes were measured using a three-factor model with three main components: cognition, affection, and willingness. This study will focus on the impact of demographic factors on consumers' purchasing attitudes toward cigarettes. With the help of averages, we can find out which cigarette is better between the ITC and the consumer's monthly expenditure, the PMI. In order to test the effect of demographic factors on consumer purchasing attitude, an ANOVA test that demographic factors do not affect consumers' purchase intention was applied. The purpose of this study was to find out which brands consumers prefer, their behaviors, beliefs and smoking preferences. Consumer preferences are tested against various parameters such as price, quality and availability of cigarettes and consumers' suggestions are solicited.

(Sandeep, 2018) Despite potential productivity gains, new voice enabled artificial intelligence such as voice commands are slowly introduced (Soronen, Turunen, & Hakulinen 2008). While few technologies such as voice assistants (Teng and Lu 2009) saw rapid consumer adoption, virtual assistants (VAs) were rarely used in practice (Soronen, Turunen, & Hakulinen 2008). Empirical studies suggest that avoidance of

interacting with devices is a result of various social norms (Legris, Ingham, and Colletette 2003) and is also influenced by perceptions of ease of use; It has been suggested due to lack of privacy, consumers avoid using voice assistants. (Muscanell and Guadagno 2012)

(Page 2015). Various reasons for using innovative devices and VA to assess and evaluate avoidance behavior have been discussed in the literature, with social norms and privacy concerns being the most common. However, there currently appear to be research gaps investigating differences in avoidance behavior and age groups, and differences in VA ownership and frequent use. Consumers are generally more receptive to using different ways of interacting to make tasks less difficult (Elvin 2003) or more productive.

(Tom brill, 2020) Meet customer expectations through interactions with your digital assistant. As businesses start to integrate voice assistants into their process, they need to offer an interactive experience to their consumers.

III. OBJECTIVES

After analyzing various literature review on consumer attitude and behavior towards digital voice assistants, following objectives have been formulated:

- To identify if there is any significant difference in

awareness levels between males and females towards voice assistants.

- To determine frequency of usage of voice assistants with respect to different age groups.
- To analyze ease of learning of voice assistants across different age profiles.
- Ascertain the importance of various attributes in the minds of consumer (accuracy, confidentiality, functionality, and ads free).

IV. RESEARCH METHODOLOGY

A. Research Design:

The research follows qualitative approach and primary data will be collected by survey. Here, we take survey of 120 people and then apply various statistical methods to recognize overall patterns and relations. This research is designed to identify the consumers attitude towards digital voice assistants, and we try to analyze if there is any significant difference in awareness between males and females.

B. Sampling

Convenience sampling method is used to select only samples who are willing to participate. The respondents vary from college and school students to teachers and professors, also families of various background in order to collect a proper diversified data.

Design the
Questionnaire

Select the
Sample

Distribute the
Questionnaire

Collect the
Questionnaire

C. Various factors affecting the consumers happiness towards voice assistants:

- Accuracy
- Confidentiality
- Functionality
- Ads free

Research methodology involves a series of steps like collection of data, assembling it and evaluating the data. Specific tools and techniques are used in this process for instance surveys, interviews, publication research and questionnaires.

D. Method of Research:

According to our objectives, the most suitable method of research is a Questionnaire. So, we have opted for this method. Questionnaires are designed to measure the attitudes of consumers by getting answers from them.

E. Type of Research:

The type of Research we are conducting is an “Exploratory Research”. It is a type of research area that needs to be studied and observed more clearly.

F. Data Type:

The type of data type we have worked on is “Primary or Raw” data type. “Primary data or raw data” is a data type that is collected for the first time, by conducting surveys, and questionnaires.

G. Data Collection Tools:

The tool we have opted for our research is a Questionnaire, which is a very easy way to collect data about my topic, because this tool will help us to understand people’s views and opinions and it will give us some knowledge about the area of improvements.

➤ Sampling Plan:

We have done our survey in Punjab (Jalandhar) and our sample size is 120 people, where we have targeted mainly the college student, and faculties.

➤ Sampling Technique:

The sampling technique that we have used for our research purpose is “Simple Random Sampling” where we used to distribute a questionnaire to the individuals, and they used to fill up the questionnaire according to their choice of answers.

➤ Sampling Frame:

As per our research, our sampling frame are from own college Lovely professional university, which is based in Jalandhar, Punjab.

➤ Sample Unit:

An individual person is considered as a sample unit.

➤ Sample Size:

Our sample size consists of 120 individuals.

V. ANALYSIS

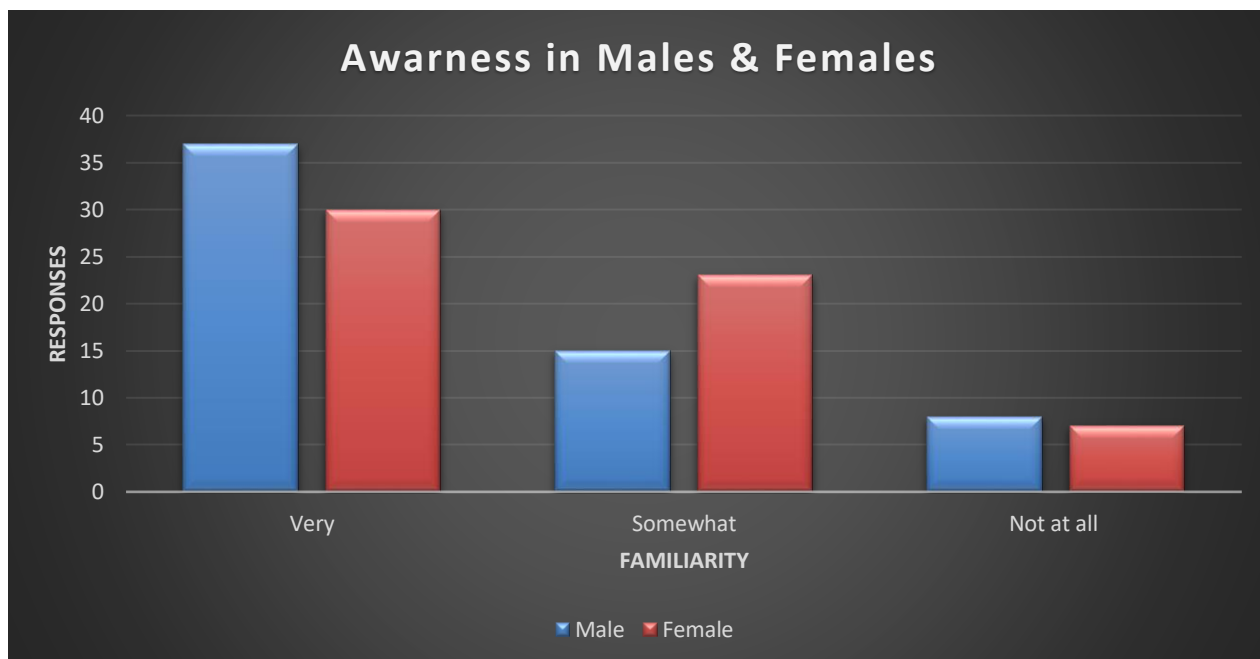


Fig. 1: Level of awareness in males & females

Rate of familiarity	Male	Female
Very	37	30
Somewhat	15	23
Not at all	8	7

Table 1: Level of awareness in males and females

- **Interpretation:** This graph shows awareness levels in male and female consumers, and there are three categories of familiarity: "Very", "Somewhat", and "Not at all." Looking at the gender-wise analysis, it can be observed that a higher number of males than females are "Very" familiar with the level of awareness (37 males compared to 30 females). Overall, the table suggests that there is some level of awareness among both males and females regarding voice assistants, with males being more familiar.

According to the table, out of the total respondents surveyed, 67 (37 males and 30 females) are "Very" familiar with the subject. Similarly, 38 respondents (15 males and 23 females) fall under the "Somewhat" familiar category, while only 15 respondents (8 males and 7 females) fall under the "Not at all" familiar category.

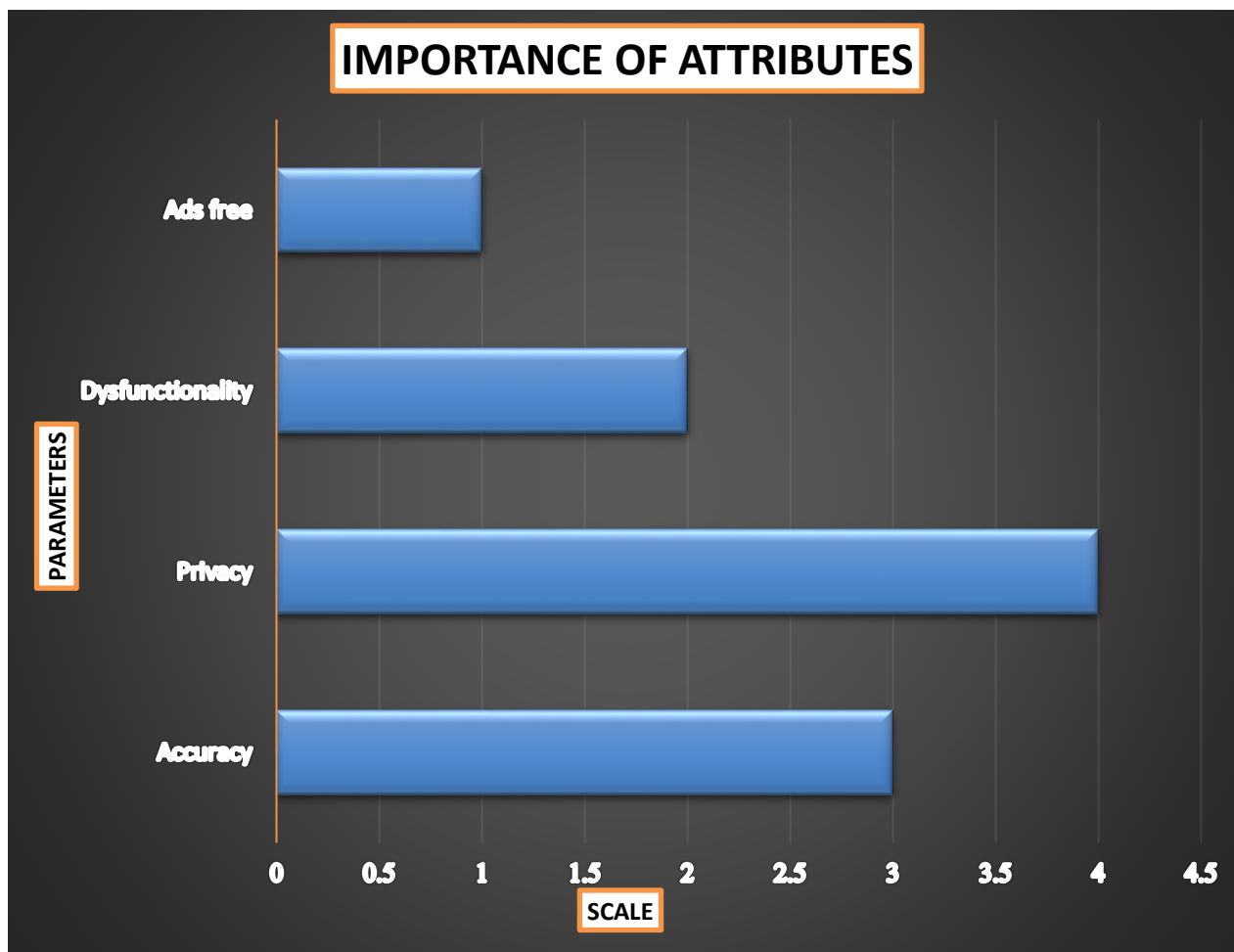


Fig. 2: Importance of attributes

- **Interpretation:** Overall, the table suggests that consumers value privacy, followed by accuracy, and functionality in digital voice assistants. Digital voice assistant providers can use this information to develop and market their products, focusing on these key attributes. Additionally, they may want to consider addressing privacy concerns in their products and services to meet consumer expectations.

Privacy and accuracy are particularly the most relevant attributes for digital voice assistants, as they often involve collecting and processing personal information. Privacy

concerns are particularly relevant given recent data breaches and concerns over data privacy. Accuracy is important for ensuring that the digital voice assistant can understand and respond to user requests correctly. Dysfunctionality is also an important attribute, as consumers expect digital voice assistants to work smoothly and without glitches. Consumers may be frustrated if a digital voice assistant does not work as expected. The least important attribute, according to the table, is ads free. This may be because consumers are used to ads in digital products and services.

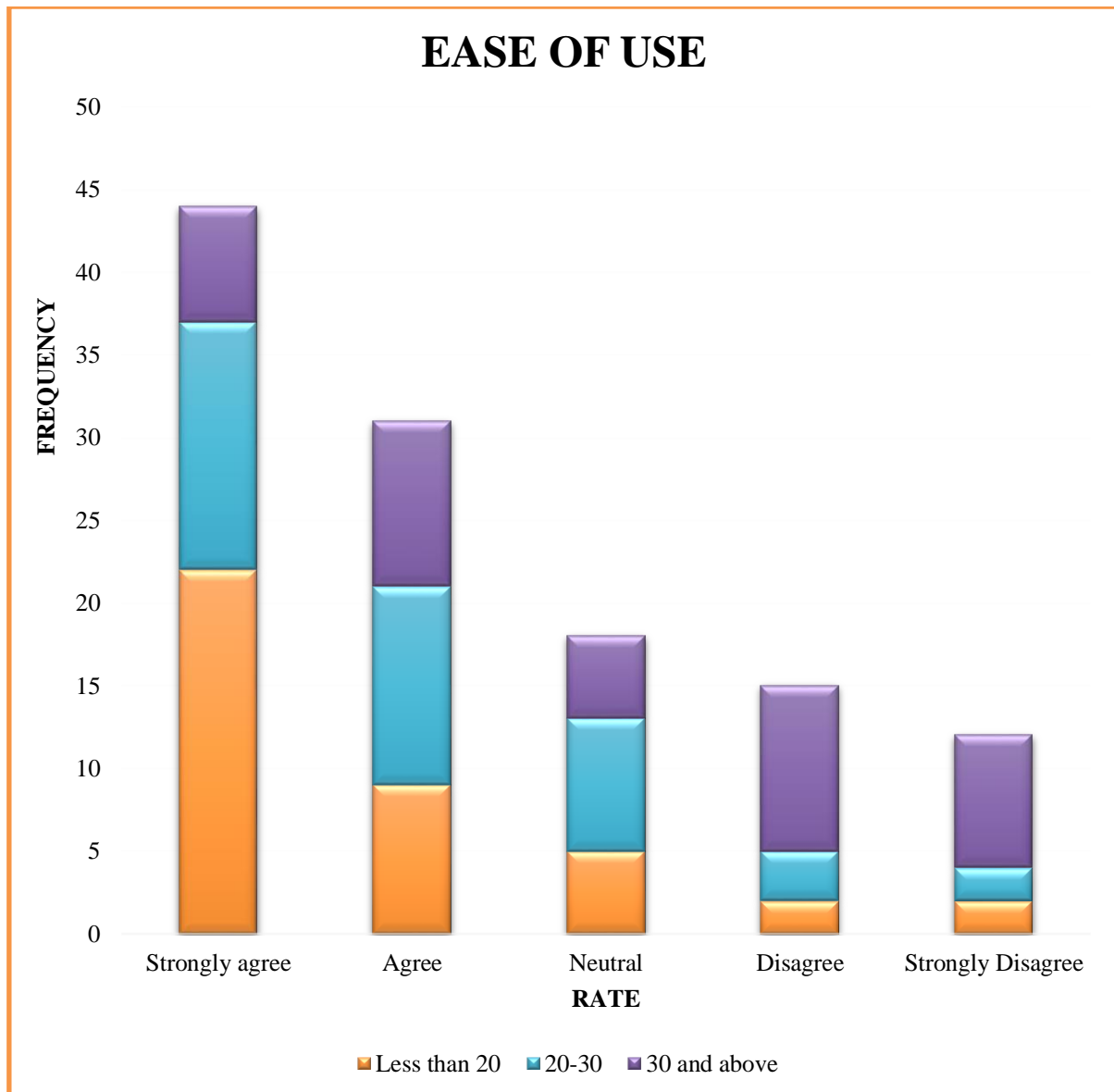


Fig. 3: Ease of using voice assistants.

- **Interpretation:** This graph gives the tally regarding the perception among consumers of different age groups regarding the ease of use of a voice assistant, with the responses categorized into five levels of agreement: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree.

Looking at the table, it appears that the majority of individuals of younger age groups found the voice assistant easy to use, with 22 individuals below the age of 20 strongly agreeing and 15 individuals aged between 20 and 30 strongly agreeing. On the other hand people above the age of 30 found it comparatively difficult to use. This may be due to factors such as declining cognitive abilities or less familiarity with new technology.

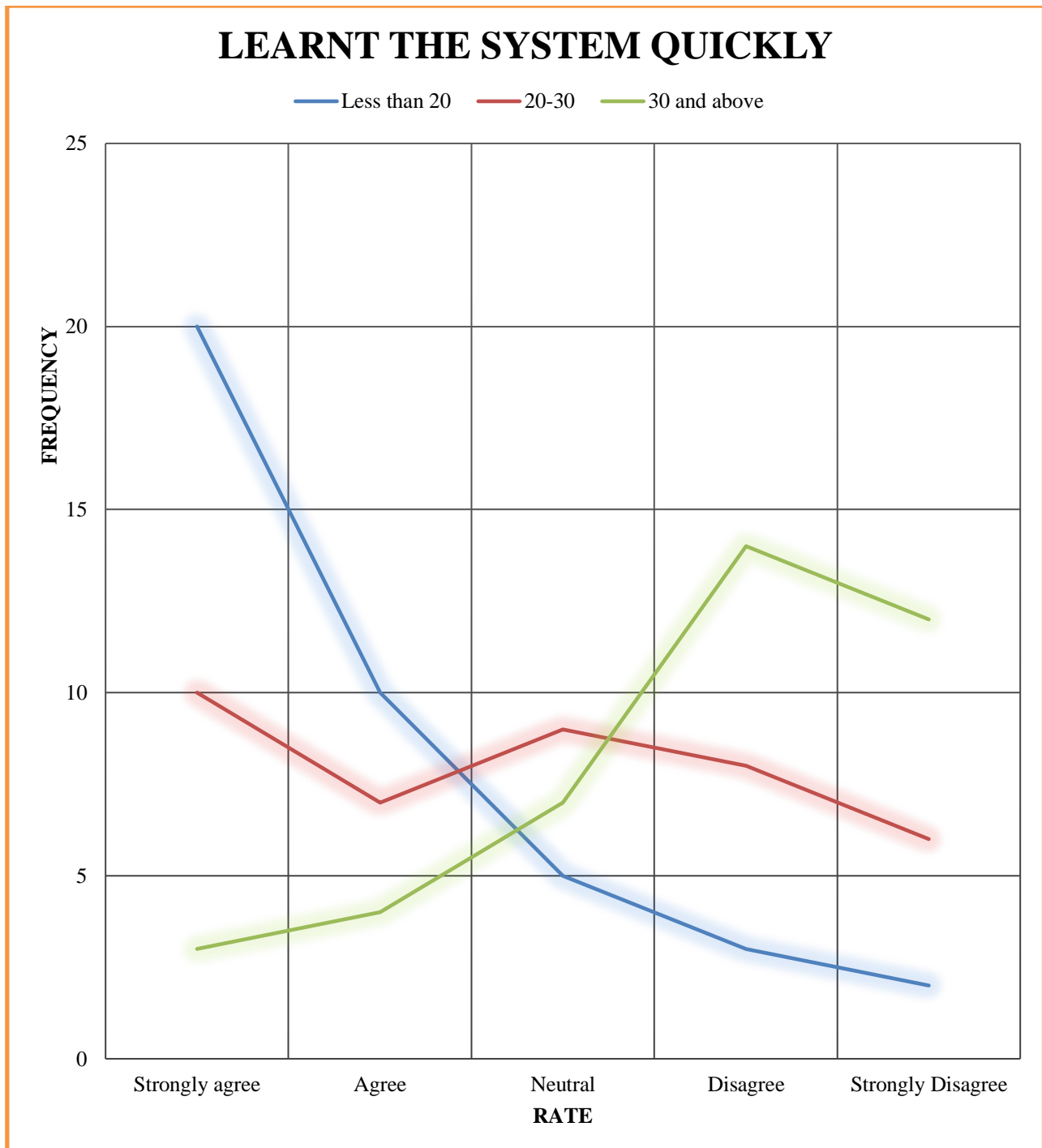


Fig. 4: Ease of learning rate

- Interpretation:** This graph shows consumers' adaptation rate to VAs (i.e., how fast they learned, and how to use virtual assistants). The analysis shows that Consumers of age less than 20 adapted and learned the VA system faster than other consumers.

Overall, the table suggests that younger individuals were more likely to learn the system quickly compared to those in the older age groups. Additionally, the number of individuals who disagreed or strongly disagreed increased with age, indicating that older individuals may have more difficulty learning new systems.

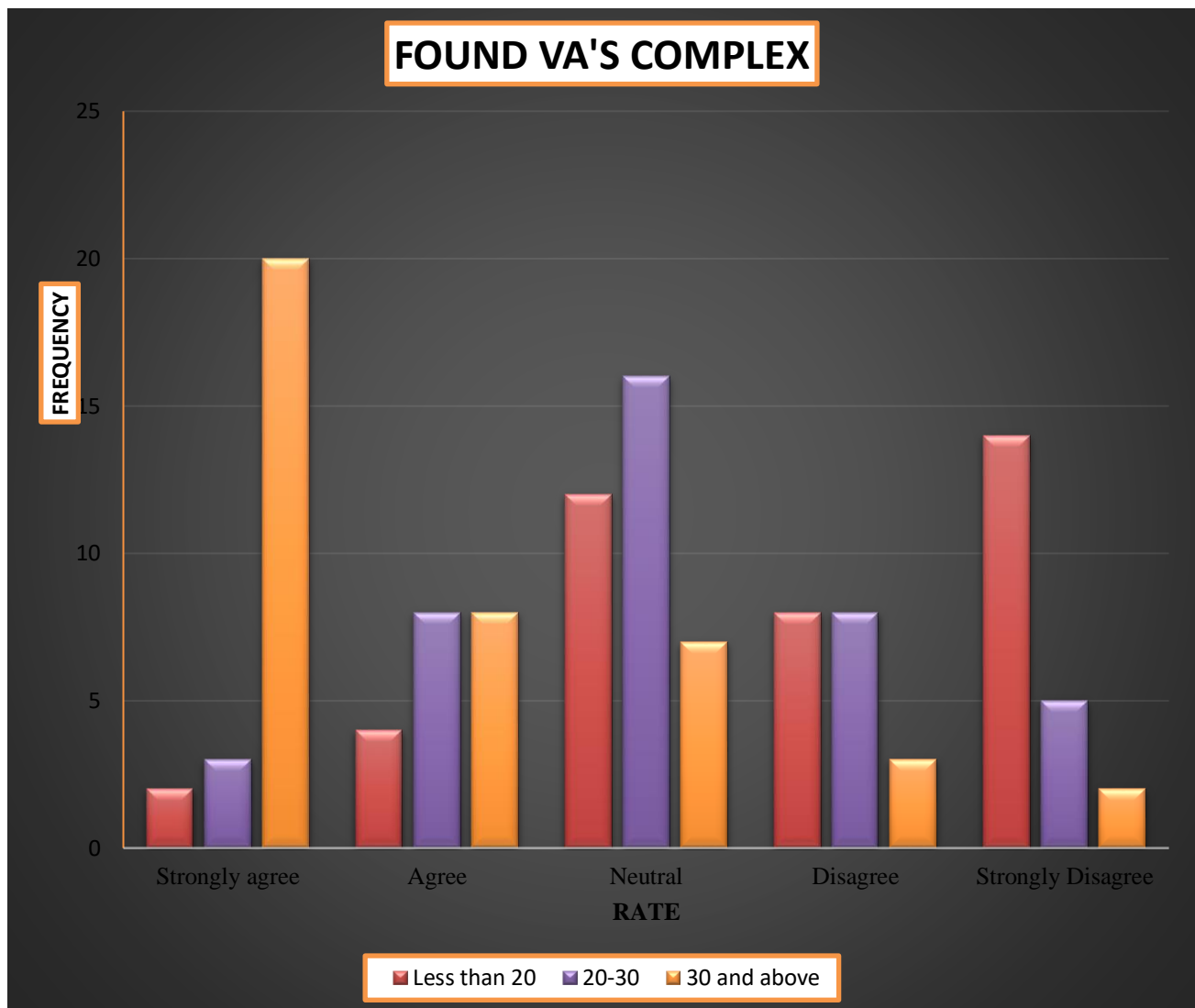


Fig. 5: Level of complexity of virtual assistants

- **INTERPRETATION:** This graph represents complexity faced by consumers with respect to VAs. Through the graph we can analyze that consumers of age 30 and above find it more difficult to use VAs.

The number of individuals who strongly agreed or agreed with the statement was highest for individuals aged 30 and above, with 20 individuals in this age group strongly agreeing that the virtual assistant was complex. In contrast, only 2 individuals below the age of 20 strongly agreed with the statement.

Overall, the table suggests that the virtual assistant may be perceived as more complex by older individuals compared to younger individuals. This may be due to factors such as declining cognitive abilities or less familiarity with new technology.

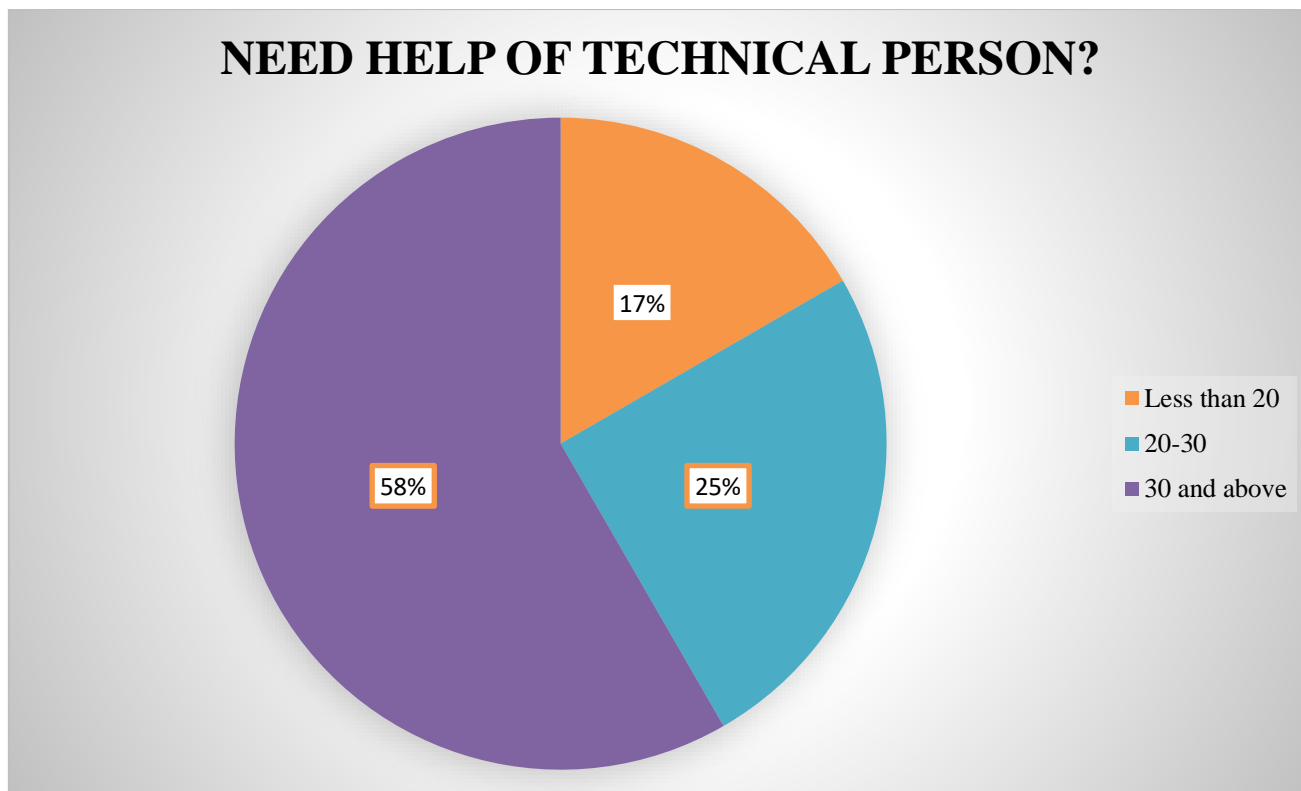


Fig. 6: Need of help while using virtual assistants

- **Interpretation:** Looking at the chart, it appears that a significant proportion of individuals aged 30 and above (58%) reported needing help while using a virtual assistant. In contrast, a much smaller proportion of individuals aged below 20 (17%) and between 20 and 30 (25%) reported needing help.

This suggests that older individuals may be more likely to have difficulty using virtual assistants and require more assistance. This may be due to factors such as declining cognitive abilities or less familiarity with new technology.

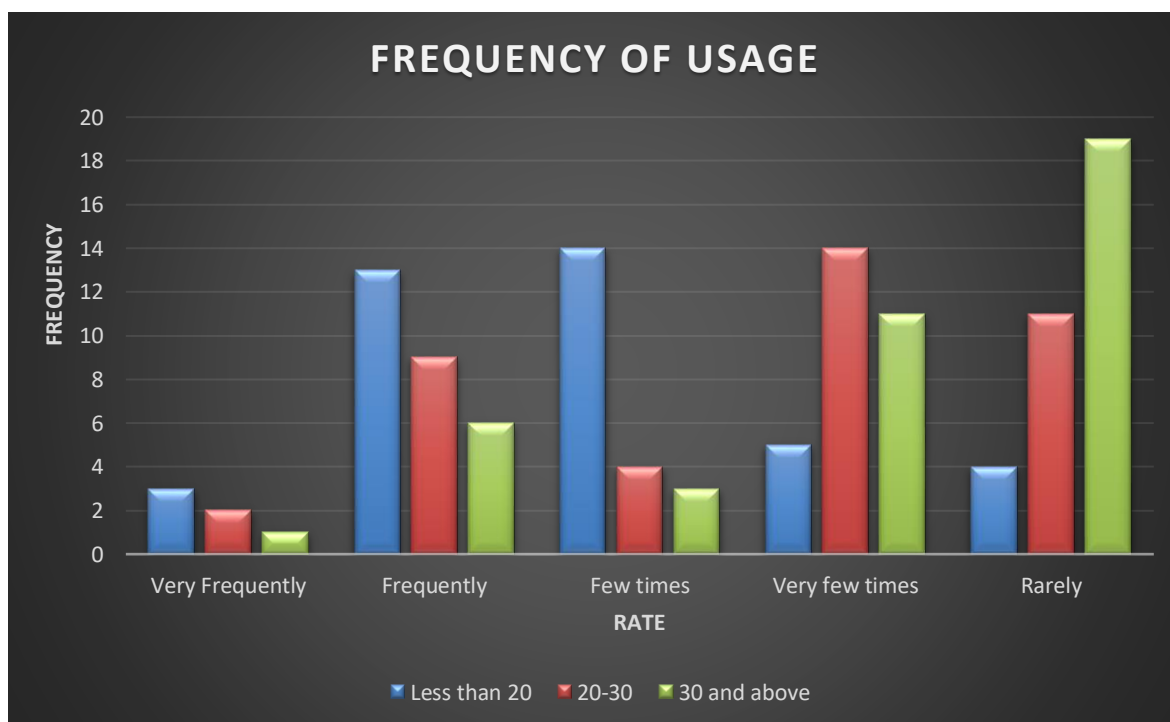


Fig. 7: Frequency of usage across different age groups

Rate	Less than 20	20-30	30 and above
Very Frequently	3	2	1
Frequently	13	9	6
Few times	14	4	3
Very few times	5	14	11
Rarely	4	11	19

Table 2: Frequency of usage across different age groups

- **Interpretation:** According to the results of the poll survey, we can observe that younger consumers (age less than 20) use the VAs more frequently than other consumers, on the other hand, older consumers (age more than 30) use the VAs rarely or less frequently.

VI. CONCLUSION

- *RQ1: Ascertaining the importance of various attributes in the minds of consumer?*

Among the four attributes that were tested, confidentiality was the highest rated factor. Users, consider privacy of their data as the most important aspect while using voice assistant.

Also, accuracy and functionality of voice assistants were second and third preference of users. The least important attribute for consumers was ads-free.

- *RQ2: To find out whether males and females differ significantly in awareness towards voice assistants.*

After analyzing, researchers found that there was a significant difference in awareness about voice assistants between males and females. Males were comparatively more aware about the virtual assistants as compared to females.

- *RQ3: To determine difference in ease of learning across different age profiles.*

Researchers concluded that younger consumers (age less than 20) easily learnt how to use virtual assistants without feeling the need of technical person. And consumers of higher, found the system complex and felt the need of technical persons to understand virtual assistants.

- *RQ4: To analyze frequency of usage across different age groups.*

Frequency of usage of voice assistants was measured across different age groups and it was concluded that younger consumers (age less than 20) use the voice assistants more frequently than older consumers. Also, consumers below the age of 20 felt that VAs make our life easier. On the other hand, elder consumers (age 30 and above) found VAs less important.

VII. QUESTIONNAIRE

Dear respondent, I am conducting a survey on "Consumer attitude towards digital voice assistants" in lovely professional university. I ask you to kindly spare your valuable time and filling up this questionnaire. I assure you that the information provided by you will only be used for the purpose of research.

Respondent's Profile:

Name: _____

Age: Less than 20, Between 20-30, Above 30

Gender: Male, Female

- How familiar are you with voice assistants (ex. Google Assistant)?
- Select the Purpose of using VA?
- How frequently you use Voice Assistants?
- Voice Assistants are easy to use?
- Did you find the system unnecessarily complex.
- Did you learn the system very quickly.
- I need help of technical person to use Voice Assistant?
- While selecting a VA which attributes are more important?
 - ✓ Accuracy
 - ✓ Confidentiality
 - ✓ Functionality
 - ✓ Ads free
- What do you expect from AI Voice Assistant in your near future?
- How likely are you to recommend a voice assistant to a friend or family member?

Thank you for sparing your valuable time for filling up this questionnaire.

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