Project Dissertation Report on

IMPACT OF AI VOICE AGENTS ON CUSTOMER PERCEPTION AND PURCHASE DECISION

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CERTIFICATION

This is to certify that the project entitled “Impact of AI Voice Agents on Customer Perception and Purchase Decision” has been successfully completed by Srajal Mishra, Enrolment No. 24/DMBA/279, in partial fulfilment of the requirements for the award of the degree.

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DECLERATION

I hereby declare that the project report titled “Impact of AI Voice Agents on Customer Perception and Purchase Decision” submitted to the Delhi School of Management, Delhi Technological University.

I further declare that this project has been prepared for academic purposes only and has not been submitted earlier, either fully or partly, for the award of any degree, diploma, or certification to any other university or institution. The information and data presented in this report are true and based on the study conducted by me. All sources of information used in this project have been properly acknowledged.

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EXECUTIVE SUMMARY

AI voice agents are currently emerging as the key drivers of transformation in business and sales processes. They are widely adopted by companies in order to enhance communication with their customers, providing them with instant service and encouraging buying behaviour. AI voice agents are powered by technologies such as natural language processing (NLP), machine learning and speech recognition, aiming to mimic human interaction and communication styles. The study explores how AI voice agents affect customer perceptions, buying decisions, company sales performance and their impact on the various stages of the sales funnel.

The research is done with primary as well as secondary data. Primary data was gathered through survey on customers' perceptions, behaviours and opinions on the usage of AI voice agents during the sales process. Responses gathered were then employed to calculate different factors, including the level of trust and satisfaction of customers and their intent to purchase, or adopt, AI enabled communication. The secondary data was gathered by conducting research using papers, journal articles, scientific reports and studies, which were available on existing literature related to AI voice technology, customer behaviour and digital selling strategies. This will enable the researcher to give practical knowledge a balance with theory.

In particular, various theoretical perspectives such as the Elaboration Likelihood Model (ELM), the Technology Acceptance Model (TAM), the Heuristic-Systematic Model (HSM), the Behavioural Reasoning Theory (BRT), the Persuasion Knowledge Model (PKM), and the CASA paradigm are applied to explain and understand how an AI voice agent affects consumer purchase decisions in terms of personalization, emotional cues, trust building, and logical information about a product.

The research shows that AI voice agents impact the effectiveness of the sales process for all stages. In the awareness stage, they enable businesses to attract potential customers through instant response, assisted product discovery and always availability. Customer engagement has been increased and businesses can easily manage their customer interactions by simultaneously interacting with a vast number of clients. The degree of impact is even greater in the consideration stage, where AI voice agents help customers by suggesting personal recommendations, comparing products and providing detailed information on products to make decisions. This has been the most effective stage for AI because customers want reassurance when they have to decide whether to buy or not.

However, the results have shown that AI voice agents have limited impacts on the last stage of the buying process which is purchasing the final product. The lack of human interaction before concluding purchases has made the customers doubtful over the privacy issues and trust concerns and it has also led to the absence of emotional assurance on the part of AI agents. AI voice agents thus perform moderately well in the post-purchase phase, maintaining relationships between the firm and its customers by ensuring follow-up actions and resolving customer service issues.

In this research, AI voice agents are compared with human sales representatives and text-based chatbots. When compared with chatbots, AI voice agents are more efficient and productive in performing repetitive, routine tasks at lower costs and managing larger volumes of sales interactions. However, compared with human sales representatives, they underperform in contexts requiring high emotional appeal, service recovery, and negotiating complex business deals where relationship-building between two parties is critical. On this basis, this study argues that the hybrid approach that combines AI's efficiency with human service providers' roles offers businesses both short-term and long-term advantages.

Furthermore, AI voice agents offer numerous advantages to a business, including Increased customer engagement and customer experience, conversion rates, sales performance. There are concerns, about data privacy and security, transparency, to ensure the safe use of AI and avoid its potential misuse, it is crucial to take a responsible approach to using AI to maintain customer Protect and foster the sustainable development of enterprises. This means that voice AI the position of the agents is one of the most powerful that help businesses and sales. processes of the present day. The system cannot take the place of human touch, Enhances the sales process with improved customer relationships and Engagements at various points in the sales cycle. On that note, personalization, trust-building features, and human-AI integration will further deepen the influence of AI voice agents on customer purchase decisions and business sales performance

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CHAPTER 1: INTRODUCTION

1.1 Background

1.1.1 Artificial Intelligence in Business.

It can be said that artificial intelligence (AI) is one of the most important technological innovations. Many businesses today are implementing AI solutions in diverse sectors for efficient management, customer interaction, sales process and marketing initiatives. Due to the increasing usage of digital platforms, e-commerce, and the constant communication with customers through the internet, businesses have changed the communication way with their customers. Nowadays, customers expect quick response, personalized interaction, convenient support and a seamless customer journey. Thus, the organization are spending a large investment on these AI based systems to improve communication with customers while providing high quality service.

AI is widely implemented in a broad range of industries such as retail, e-commerce, finance, health, education, hospitality and telecommunications. Businesses adopt the applications of AI in their processes for various purposes, including customer service, product recommendation system, predict analysis, automatic marketing, sales management, etc. Of all these AI applications, AI voice agent is one of the crucial systems in order to interact and support customers at sales, since it can provide instantaneous and human-like service. [1][6][11] [8][14][15] [2][3][28]

1.1.2 Concept of AI Voice Agent.

AI voice agents are an advanced type of AI that can communicate with customers through voices. It usually involves several AI technologies such as Natural Language Processing (NLP), Machine Learning, Speech Recognition and Conversational AI to understand what customers demand, and to respond to customers in a timely manner. Businesses can utilize AI voice agents to answer their questions, recommend products to them, assist them in solving technical problems, handling complaints, booking appointments, guiding customers throughout their buying processes and more. [3][17][18] [1][6][11]

In contrast with older automated telephone systems, which sounded mechanical, AI voice agents are designed to have more natural and human-like conversation with customers. While traditional businesses have to rely on human representatives or text based chatbot for communication, the former can understand what customers feel and build customer relationships, but their limitation is the time and money consuming aspect when handling numerous customer services. On the other hand, text based chatbots are fast and automated, but their conversation lacks of natural feel. AI voice agents however are able to balance automation and interaction efficiently to enhance communication with customers. Currently, organizations are widely using AI voice agents for their customer service, sales

assistant, appointment booking, recommendation, handling complaint and support after sale services. [1][6][11] [8][14][15] [2][3][28]

1.1.3 Evolution of AI Voice Agents in Sales and Customer Service.

The evolution of AI voice technology has greatly transformed how businesses manage their customer interactions and sales. Early AI systems were very limited due to its poor natural language understanding and simple rule-based system. Current AI voice agents however have evolved to become capable of understanding intent, dialogue context and customer behaviour patterns. What we've seen is that, with AI voice agents, the use has moved from being a mere customer service tool to forming customer relationships and creating a great customer experience. It's not just about customer problem solving anymore; businesses are now working to enhance the entire customer experience and build lasting customer relationships. These systems can also enable more interactive and conversational communications. The integration of AI voice agents in online sales and e-commerce is highly valuable, since clients may need real-time assistance at each level of the sales funnel. Such systems help increase customer engagement and conversion rates from the stage of awareness to post-purchase. The dependency on AI voice agents for strengthening relationships with clients and boosting sales is expected to increase further. [3][17][18] [33][34][35] [1][6][11] [6][13][17] [26][45]

1.1.4 Customer Experience growing importance.

It has already been argued that customer experience is becoming increasingly competitive in the present world. Nowadays, customers not only value the quality and price of products but they are also expecting the service provided by the company be fast, reliable, personalised and more communicative. Companies which are able to create a positive experience will always achieve better customer satisfaction, higher customer loyalty and repeat purchase. The AI voice agents play a big role to enhance customer experience by providing a 24/7 service, instant response to customers, and personalized communication. The system is also capable of interacting with many customers at the same time without the need to hire new staff and therefore helps reducing operation cost. In addition, it also enables business to collect and analyze data in order to understand their customers, create better sales strategies, and offer a personalized purchasing experience with better product recommendations. As a result, various organizations are implementing the technology of AI voice agents in their customer engagement and sales strategies. [3][17][18] [1][6][11] [6][13][17] [18][36] [2][3][28]

1.1.5 The Role of AI Voice Agents in the Sales Funnel.

AI voice agents are utilized in multiple stages of the sales funnel, specifically the awareness stage, consideration, decision-making, and post-purchase support stages. Customers gain attention by the AI's fast responsiveness, product knowledge, and interactive communication features when the

awareness stage comes. At the consideration phase, the AI voice agents will guide the clients by comparing products, demonstrating functions, and providing suitable recommendations based on individual requirements. It assists the customers throughout the process of purchase and reduces their concerns with intelligent dialogue while helping to convince them for final buying. After the purchase is made, AI voice agents assist customers to handle their issues through complaint handling, post-purchase support, following up interaction, and building strong relationship. In order to acquire maximum utilization of AI voice agents, it can assist customers through whole sales funnel, thus increases sales conversion rate and strengthens long-term customer relationship. Although, the degree of usage efficiency depends on many factors such as customers trust, emotional interaction, and communication quality. [4][11][12] [3][17][18] [33][34][35] [1][6][11] [2][3][28]

1.1.6 Business Benefit of AI Voice Agents.

In summary, there are several beneficial effects in utilizing AI voice agents for businesses. First, these systems can enhance operational efficiency by handling an overwhelming amount of customer interactions at the same time, without the need to hire new staff members. Second, they have the potential to significantly increase the work productivity since tasks like answering frequently asked questions, making appointments and delivering product information are allautomated by AI systems. Lastly, by making conversations interactive and individualized, AI voice agents can boost customer engagement, customer satisfaction and sales conversion rates. Last but not least, through collecting and analysing customer data from the conversations, businesses will be able to understand their customers much better, in turn enable them to further develop their sales and customer engagement strategies. [33][34][35] [1][6][11] [6][13][17] [18][36] [26][45]

1.1.7 Challenges and concerns regarding AI Voice Agents.

However, AI voice agents are facing some challenges and concerns among business and customers. Firstly, customers may lack of trust over the system because it might cause misinformation, lack of emotion and quality of conversation. Secondly, data privacy and security have become one of the key concerns of users since it may involve storing and using their information throughout interaction process. Customers are always concerned about where is their personal data saved and how can they be protected. Ethical issue, including manipulation and data abuse, can also affect the trust from the customers. Thirdly, the AI voice agents are still lacked of emotional intelligence; they are able to converse like humans, but are still not able to understand customer's emotions and empathy at critical times. Therefore, in emotionally intensive situations, or when clients have complaints and major decision-making concerns, they are still looking forward for human help. [4][11][12] [22][29][31] [22][29] [1][6][11]

1.2 Problem Statement

Artificial Intelligence (AI) is transforming modern business operations and changing the way companies interact with customers Businesses are increasingly adopting AI-powered technologies to improve customer communication, marketing strategies, sales performance, and customer service efficiency. AI voice agents have emerged as one of the most crucial technologies among them. Since they can deliver human-like dialogues, customised suggestions, and instant customer support. These systems use technologies such as Natural Language Processing (NLP), machine learning, and speech recognition to communicate with customers in real-time during the processes. At various stages of the customer buying process. AI voice agents have become commonplace in industries enhance, among others, retail, banking, health, hospitality, telecom, and e-commerce.Retail, banking, health, hospitality, telecom and e-commerce are among the sectors that can be improved. Customer engagement and business performance. [3][17][18] [33][34][35] [1][6][11] [6][13][17] [8][14][15] [2][3][28]

The surging rise of digital platforms, online shopping, and automated customer service channels has Rising customer expectations for quick response times, customization, and customer support. Growing customer demand for rapid response, customization and around-the-clock service. availability. Therefore, companies are increasingly reliant on AI voice technologies for managing. customer interactions efficiently. Yet, even as AI voice agents are gaining traction, there are still several challenges to address. There is a lack of understanding about how they actually affect customer perception, trust, emotional and physical connection to the brand. Satisfaction, buying choices, and lengthy client partnerships. Many organizations are Focusing on AI investment, yet still, there is doubt whether the customers completely embrace these. whether AI voice agents can actually drive the desired customer behaviour and the technologies involved. Enhance the effectiveness of business sales. [4][11][12] [3][17][18] [33][34][35] [1][6][11] [26][45]

1.2.1 Increasing Dependence on AI Voice Technology

AI voice agents enable businesses to enhance their communication and engagement skills, making them more relevant in today's digital era. customer support activities. The advent of ecommerce sites and digital services have given rise to robust platforms. wants for effective communication systems that can quickly offer help and personalized interactions. The customer today demands fast resolution of his problem, continuous support and convenience. while interacting with businesses. AI voice agents address these expectations by leveraging AI voice agents, organizations can: Providing live answers and automated customer support. With these benefits, enterprises are increasingly turning to these choices for their websites. across different industries are integrating AI voice agents into their sales and customer service operations. [1][6][11]

While AI voice technology is increasingly popular, businesses are uncertain about its application and the impact it will have. The acceptance and long-term performance of these systems by customers. Companies need better An awareness of how customers respond to content created by artificial intelligence and if systems like this exist. Have a positive impact on customer trust and buying. [4][11][12]

1.2.2 Lack of Understanding About Customer Perception

One of the major problems associated with AI voice agents is the lack of clear understanding Concerning customer perception and attitude towards these systems. Customer acceptance is a factor in the adoption of information technology. A crucial factor in the effectiveness of any AI technology. AI voice agents offer a range of advantages.AI voice agents have several benefits. Despite convenience and speed of communication and access, many customers still feel uncomfortable communicating with non- human systems. [1][6][11]

Consumers tend to have questions about trust, reliability, emotional understanding and safety of their personal information. AI systems also have the advantage of their fast response time, which is appreciated by some customers. and convenience support and others prefer human representatives which would give emotional support. Comfort, understanding and empathy in complex situations. Customers might also ask Whether AI recommendations are beneficial or primarily geared toward earning company profits. [4][11][12] [2][3][28] [26][45]

Further, customers' perceptions are different based on their age, technological know-how, Communication style, and prior experience with AI technologies. Businesses therefore face challenges related to comprehending customer expectations and creating AI systems that meet various needs. Delivers effective performance with different types of customers. [26][45]

1.2.3 Challenges in Influencing Customer Purchase Decisions

The other significant aspect is the impact that AI voice agents have on the buying decision-making process. decisions. Companies are increasingly employing AI systems for product suggestions, answering customer inquiries, and providing product details. answer customers' questions, and lead the customers in the purchasing process. Despite this, the question remains whether or not Some people are optimistic about AI voice agents and their potential to impact real-world customer transactions while others are skeptical. [3][17][18] [1][6][11] [2][3][28] [26][45]

If you're looking to boost your sales funnel from the awareness and consideration phase, AI voice agents might be able to help. They can give instant information, customized tips, and product comparisons. Yet, there seems to be a lack of confidence in AI systems for the final stage of a purchase. decisions, particularly in relation to spending money or making important purchases that

may impact a person's emotions. Human Emotions, confidence and trust remain significant factors in customers' purchase decisions, and unfortunately, AI systems can't accurately mimic these emotional elements of communication. [4][11][12] [3][17][18] [1][6][11] [26][45]

1.2.4 Problems Related to Trust and Emotional Connection

Trust and emotional connection are among the biggest challenges faced by AI voice agents. Although AI systems can imitate human conversations, they often fail to provide genuine emotional intelligence and empathy. Customers may feel that AI systems do not truly understand their emotions, personal situations, or concerns. [4][11][12] [1][6][11] [26][45]

This issue becomes more serious during complaint handling, customer frustration, or high-value purchase situations where customers usually expect emotional reassurance and personal understanding from human representatives. Customers may also doubt the transparency, fairness, and accuracy of AI-generated recommendations. If customers believe that AI systems are designed mainly to manipulate buying behavior for company benefit, their trust in the system may decrease significantly. [4][11][12] [3][17][18] [2][3][28] [26][45]

1.2.5 Privacy and Ethical Concerns

Privacy and ethical issues are significant challenges in the realm of AI-driven customer communication. AI voice agents gather, work with and assess customer information during conversations, making Worries about privacy of data, security of data, and the misuse of personal information. Customers are Becoming more conscious of the nature of gathering and processing business information. [22][29][31] [22][29] [1][6][11]

There is a common concern among customers regarding the recording, storage, and sharing of their conversations. without their permission. When customers are not made aware of how their data is used, it can instill a lack of trust in the organization. discourage customers from using AI communication systems. Ethical Issues also emerge when AI Persuasive communication techniques and over personalisation to influence in systems customer decisions. While these techniques can make salespeople more effective, they can also induce them to do so. Induces a sense of manipulation and diminishes customer trust in AI systems. [4][11][12] [22][29] [33][34][35] [26][45]

1.2.6 Uncertainty about business effectiveness

AI voice technology is a major investment targeted by businesses with hopes that they will be able to do what they can in terms of enabling them with AI. Optimize operations, increase the customer experience, enhance conversion rates, and boost sales performance. performance. In practice, though, the usefulness of AI voice agents is still not clear since they are not necessarily effective at Different

industries and customer segments can have varying business outcomes. [33][34][35] [1][6][11] [18][36]

For some companies, the benefits can include better customer engagement and lower operating expenses, and more. Others might experience issues like low communication quality, customer dissatisfaction, or similar issues, This leads to customer mistrust and reduced customer trust. The effectiveness of AI voice agents relies on a variety of factors, including industry. The nature of the communication, the design quality, the personalization of the communication, and customer expectations.

1.2.7 Need for the Present Study

The increase in application of AI voice agents in sales and customer service contexts paved way for this research. The number of usages of the AI voice agents is increasing by every day but, the number of research study has been conducted on how the AI voice agent affect the customers perception and purchasing decision and also the company sale has been found to be comparatively lesser. This study helps to cover the gaps by exploring on how AI voice agents can impact throughout the sales funnel and the factors affecting the customers trust, engagement, and purchase intent. This study primarily focuses on the shortcomings, business limitations and ethical issues of the use of the AI driven customer interactions. Various primary and secondary data sources were used in this study in order to provide theoretical and practical implication of the topic discussed. The results of this study can assist in managing business to understand the implementation process of the AI voice agents effectively so that customers do not lose trust on the system and help to grow the business in the long term. [4][11][12] [3][17][18] [22][29] [1][6][11]

1.3 Objectives of the Study

AI voice agents have emerged as a crucial component of contemporary business and sales techniques as businesses have embraced them. Businesses have welcomed AI voice agents as a vital element of modern business and sales tactics, and these agents are now playing a crucial role in this area. more and more are being used to streamline customer interactions, provide fast service, and build customer relationships. customized experiences. Transforming business challenges into opportunities with the power of advanced technology such as NLP, machine learning and speech recognition. In recognition systems, these systems communicate with the clients in a natural and human like way. AI voice agents These are used in many situations including customer service, e-commerce, sales support and digital. marketing to improve the level of interaction with customers and influence consumer purchasing behaviour. As the but as there is greater demand for improved customer experience in the digital world, companies are investing in it. A keen awareness of the strengths and limitations of AI solutions,

which are supposed to provide real-time responses and constant availability Good organization and effective handling of client contacts. [3][17][18] [1][6][11] [8][14][15]

With the growing use of AI voice agents, it has become imperative to study the impact of these agents on customer perceptions, buying behaviors and company sales performance. Although these systems the advantages of using are quite a lot, such as creating more scalable systems, personalizations and operational efficiency, these systems do not come without some disadvantages, namely related to trust, privacy, emotional Communication, ethics and so on. Some customers continue to opt for human interaction As AI agents might lack emotional intelligence, they may not be able to offer emotional support during critical purchases. Be able to communicate in a way that conveys reassurance or understanding of clients' feelings. Given the developments, the current, The goal of the study is to investigate how effective AI voice agents are at each step of the sales journey, In addition to grasping client responses to AI-powered conversations in sales, you need to understand the reactions of these clients. scenarios. In the section on the potential, limitations and future direction of AI, the research focuses on the potential of AI, its limitations, and its future direction. voice agents in enhancing customer engagement and company performance. [4][11][12] [3][17][18] [22][29][31] [22][29] [33][34][35] [1][6][11] [6][13][17]

1. To explore how AI voice agents affect customers' perceptions of the brand.

The aim of the present study is to find out the perception of customers towards AI voice agents. in sales and service situations. The research is aimed at forming opinions of customers regarding the levels of trust, convenience, quality of conversation, and their overall experience with the AI based systems. Although the goal is for AI voice agents to mimic the nature of human conversation, The comfort and reliability that such interactions may bring influences the levels of trust that customers place in their suppliers. The study also sets out to ascertain if these AI driven systems lead to the development of positive customer Personal experiences and interactions with a business. [4][11][12] [1][6][11]

2. To determine how AI voice agents affect customer purchases.

Another goal of this study is to determine how customers' decisions to purchase and decision making is shaped by the process of shopping. influenced by AI voice agents. The study reveals if the use of such personalized suggestions, prompt reactions and dynamic interactions motivate customers to finalize transactions. It also covers whether or not these systems enhance client belief and the closing sale, guiding them successfully towards concluding the purchase process. [3][17][18] [1][6][11]

3. To measure the efficiency of AI voice agents across the sales funnel.

The aim of the ongoing research is to test the effectiveness of the AI voice agents at what they do. Capable of accomplishing throughout the entire sales cycle, from first exposure through follow up and beyond services. The study attempts to discover the best way these can “catch” client interest, offer them something, and get them to return.The study aims to understand how these can capture the interest of the client, offer something and get them back again. Provide details of different products, help to compare and increase customer engagement. It also recognizes those stages in the sales process in which AI agents tend to perform well and others which may still need human assistance. [3][17][18] [1][6][11]

4. To understand what factors will impact customer acceptance and trust of AI voice agents.

The study's aim is to identify the key variables which determine customer trust in AI voice technology. Factors such as the tone of the voice, degree of personalization, perceived usefulness, reliability, The use of transparency and privacy aspects of data are treated in detail. It aims to learn how in which such factors affect customer satisfaction, customer confidence, and the customers' willingness to communicate with In sales conversations, use AI agents. [4][11][12] [22][29][31] [18][36]

5. To differentiate AI voice agents from human sales agents and text-based chatbots.

Another goal of the study is to contrast the usage of AI voice agents with other available methods of Interactions with human agents and chatbots powered by text. The study is designed to find out Variations in levels of customer engagement, scalability, emotional intelligence, trust and efficiency. This comparison will provide an indication as to whether AI voice agents have the capacity to fully Replace human workers or if AI and human interaction can be more effective for businesses. [4][11][12] [1][6][11] [6][13][17]

6. To examine the effect of AI voice agents on company sales performance.

This research will also seek to identify how AI voice agents contribute to overall company and sales performance. The impact these agents have on issues such as conversion rates, customer satisfaction levels, productivity, operational cost savings and operational efficiency will be investigated. The study further seeks to determine how businesses can use AI voice technology effectively to improve customer relations and achieve improved sales figures in highly competitive environments. [33][34][35] [1][6][11] [18][36]

7. To research the ethical issues associated with AI voice agents.

One more aim of the current study is to explore some of the ethical issues surrounding the deployment of AI voice agents in business environments. The research examines concerns related to data security, privacy issues, the manipulation of clients, information protection and other aspects. It also seeks to

investigate the way these ethical issues may affect long term customer loyalty towards AI based systems. [22][29][31] [22][29] [1][6][11]

8. To make suggestions for optimal implementation of AI voice agents.

Lastly, the final aim of this study is to develop some tangible suggestions regarding effective strategies that firms may adopt to improve the performance of their AI voice agents. This will include ways to enhance customer experience, meet ethical obligations, and effectively combine the benefits of AI technology with the human touch to ensure long-term business success. [22][29] [1][6][11]

1.4 Scope of Study

AI voice agents have a substantial part to play in current business activities, including customer service, sales, and marketing management. The use of AI-based voice systems has grown significantly over recent times to facilitate improved customer communication, personal support and overall customer experience. Rapid development of technological infrastructure and customer online activities means that business organizations can identify solutions to cater for fast responses, constant support and efficient customer transactions. AI voice agents are presently utilized in numerous sectors such as banking, e-commerce, telecommunications, health services, hospitality, and retail to aid customer support and business expansion. [1][6][11]

The current research study is geared towards the effect that AI voice agents have on customers and purchase behaviour, as well as overall sales performance of business organizations. Within the range of this study is how AI voice agents can improve sales funnel activities and customer communication. Also examined in this study are potential opportunities, limitations, and challenges to AI voice technology, and the possible application in sales and customer relationship management. [3][17][18] [33][34][35] [1][6][11]

1.4.1 Customer Perception Area:

The study is about examining customer perception via communication, trust, convenience of using, personal satisfaction, as well as customer comfort while dealing with AI voice agents. The study investigates how customer experience of AI systems, human agents, or even text-chatting bots can determine customer choice of using any sales agent. The voice characteristics such as tone, accent, speech pace used to interact with customers also effect customer's approach to the AI voice agent. [4][11][12] [1][6][11] [26][45]

1.4.2 Customer Purchase Decision Area:

This part of the study is to figure out how an AI voice agent can influence a customer's purchase decision. Is it about AI's recommendation to buy the product or it influences selection and final decision? It's also about the emotional comfort level, utility, and trust in the system; and how the

human agent still has an edge while in certain circumstances before the purchase decision, customer prefers to get human help. [4][11][12] [3][17][18] [1][6][11] [2][3][28]

1.4.3 Sales Funnel Area:

The study examines the suitability of AI voice agents at different stage of sales funnel including awareness, consideration, decision making and after sale supporting. The study assess the effectiveness of AI agents based on immediate response, recommendation ability, complaint handling skill, customer support, as well as the effectiveness at each stage of sales funnel in contrast to human agents. [1][6][11] [2][3][28]

1.4.4 Business Performance Area:

The section discusses on the business performance by checking sales conversion rate, retention rate of customer, operational efficiency and business scalability, the cost reduction and the effectiveness of AI agents in handling the mass of customers and enhancing their satisfaction as well as sales performance. [33][34][35]

1.4.5 Comparison Area with Human sales representatives:

The research compares AI voice agents to human sales representatives based on different aspect such as voice quality, understanding of emotion and trust by the customer, business scalability, and overall customer satisfaction as well as compares areas where humans agents stand better than AI (especially on emotionally driven complex situation) or vice versa. [4][11][12] [1][6][11] [18][36]

1.4.7 Future Trends and Development Area:

Also included are the possible future trends in voice agent technologies, the study talks about increasing intelligence level to understand human emotion, learning capacity of AI systems as well as the advancement of customization and integration within CRM systems. [1][6][11] [26][45]

The research confirms that future will be heavily invested in AI voice agents as part of the communication in modern business environments, with an increased need for customer trust and balance between AI systems and human communication. [4][11][12] [1][6][11] [26][45]

This research study explores all the related factors of AI voice agents, from the customers behavior toward the system, to their purchase decision-making process, the business gains, and the issues associated with ethical implications and future prospects of the technology. By providing the exploration of the practical and theoretical aspects of AI voice agents and the related business implications, the research provides a comprehensive review of how this emerging technology can alter current sales and customer service activities. These results will benefit companies to understand all pros and cons associated with the AI voice agents' implementation and how to incorporate them

effectively into their business processes in order to increase customers engagement, and improve their sales. [3][17][18] [22][29] [1][6][11]

CHAPTER 2: LITERATURE REVIEW

2.1 Theoretical Foundations and Conceptual Frameworks of AI Voice Agents

With the wide usage of AI voice agents in sales, customer service, and marketing industries, various marketing, psychology, consumer behaviour, and information system scholars developed different theoretical models to understand how consumers engage with AI voice agents and how the systems affect consumers trust, engagement, satisfaction, and intention to buy. These theories assist companies to understand why customers adopt or reject AI based communication systems and how AI voice systems impact on present-day buying behaviour. [4][11][12] [3][17][18] [1][6][11]

2.1.1 Uses and Gratifications Theory (UGT)

The Users and Gratifications Theory (UGT) posits that customers use certain media for personal satisfaction and to meet their own purposes and needs. The main reason customers use AI voice agents is convenience; thus consumers use AI voice assistants to have faster communication, efficient searches for goods and easier buying procedures during the purchase processes and finally achieve time-saving and workload reduction to improve decision making for online purchase tasks. [3][17][18] [1][6][11]

The key benefits of using AI voice agents are: entertainment, convenience, cognitive aids, and personalization. Researchers are also adopting UGT with technology adoption theories to understand customer behaviors toward voice commerce and AI supported purchasing environments. [1][6][11]

2.1.2 Technology Acceptance Models (TAM, UTAUT, ECM)

Technology Acceptance Models (TAM) were some of the most commonly utilized theories in research concerning AI voice agents. The factors which most impact customer adoption of AI voice assistants include TAM, UTAUT and ECM model: [1][6][11] [4][40]

- Perceived usefulness
- Ease of use
- Performance expectancy
- Customer satisfaction
- Confirmation of expectations

The main argument of these models is that AI voice assistants are highly to be adopted if they improve efficiency, offer useful recommendations, and fulfill customer expectations once usage has been performed. [1][6][11] [2][3][28]

2.1.3 Resource Scarcity Theory

Resource Scarcity Theory is the model explaining that customers prefer the use of technology that save time, efforts, and cognitive resources. In current market, customers are under high-pressure due to information overflow and they are time-constraint to search and make a purchase decision. The AI voice assistants, however, streamline purchase decision making by providing quick answers and accurate recommendations based on customer requests, thus reduce consumers' cognitive load and increase shopping efficiency in online purchasing behavior. [3][17][18] [1][6][11] [2][3][28]

2.1.4 Surrogate Shopping and AI Delegation

The concept of surrogate shopping describe the process where a consumer outsources the purchasing role to an intermediary, such as salespeople and other agents. The role of the intermediary in traditional settings has recently been assumed by AI voice agents to play a part as a shopping assistant to customers. [1][6][11]

Customer trust and responsibility are delegated to AI systems through recommendations and automated processes, making anthropomorphic voice agents important to build trust, authority and alignment with customer values. [4][11][12] [1][6][11] [2][3][28] [26][45]

2.1.5 Heuristic-Systematic Model (HSM)

The Heuristic-Systematic Model (HSM) offers an account for the consumers processing information transmitted through an AI voice assistant, with two modes: The heuristic processing (simple and rapid, and it implies low-involvement buying contexts), and the systematic processing (comprehensive and requires high-effort, it implies high-involvement buying contexts). Thus, while convenience and brief recommendations drive low-involvement products, high-involvement product purchase are driven by deep emotional reassurance, self-confidence, and detailed purchase decision evaluation of an AI voice agent; the theory explains why customers will react differently to the recommendations of an AI voice agent. [3][17][18] [1][6][11] [2][3][28]

2.1.6 Anthropomorphism and Uncanny Valley Effect

Anthropomorphism is defined as giving anthropomorphic characteristics to AI systems. The development of AI voice assistants with human-like voices and communication patterns enhance customer interaction engagement and emotions. Conversely, extreme anthropomorphism can cause humans feel uneasy and "uncanny," known as uncanny valley effect, and research suggest that appropriate anthropomorphism enhances trust and emotional intimacy between consumers and the system; while a high level of human likability will raise human fear and unease toward an AI. [4][11][12] [7][8][13] [7][9] [1][6][11] [8][14][15] [26][45]

2.1.7 Behavioural Reasoning Theory (BRT) and Engagement Dynamics

BRT accounts for both positive and negative reasoning behind AI adoption among consumers. Trust, usefulness, ease of use and convenience will have positive effects, while privacy concerns, fear of data security and privacy will create resistance in customers to adopt the technology. Such factors contribute to understand the differing engagement behavior exhibited by customers toward AI. [4][11][12] [22][29][31]

2.1.8 S-O-R model and the Impact on the Customer Journey

The stimulus-organism-response (S-O-R) model posits that certain stimuli of an AI voice assistant affects the organism (customer's emotions and mind) then triggers responses (behavior). The stimulus are the quality of the communication (voice, language) of AI, the personalization ability of the system, and the relevance of product recommendation; the organism could be described as a stimulus such as customers' trust in the AI, customers' excitement and satisfaction from interactions. Finally, the response would be reflected by customer's willingness to make a purchase and their future behavior and loyalty toward an AI voice assistant. The model can demonstrate the impact of AI voice agent on customer journey across stages. [4][11][12] [3][17][18] [1][6][11] [2][3][28]

2.2 Psychological Mechanisms and Consumer Perceptions of AI Voice Agents

Psychological mechanisms such as trust, emotional bonding, anthropomorphism and social presence have a great impact on the nature of human-computer interactions. With its anthropomorphic design, AI voice agents can enhance the interaction engagement and emotions, making it seem more natural and human like. Nevertheless, too high level of resemblance can trigger an "uncanny valley" effect. Trust formation is the critical psychological factors in determining customer's AI voice agents' adoption, the competence, the friendliness and the transparency of the AI voice assistant may boost the users' confidences. Voice-related features like tonal patterns, interactional behaviors and emotional expressions can further enhance it. [4][11][12] [7][8][13] [7][9] [1][6][11]

Compared with chatbot, AI voice assistant is capable of creating a stronger social presence and deeper emotional engagement with users. Convenience, emotional investment, usefulness, perceived ease of use, and confirmation of expectations were recognized as important psychological drivers that strongly influence customer purchase intentions and satisfaction from interaction with AI. [3][17][18] [1][6][11]

2.3 The Impact on the Customer Journey and Purchasing Decision Processes

AI voice assistants have significantly influenced customer buying behaviors throughout various phases of the customer journey. During the awareness and consideration stages, AI assistants streamline the search process and deliver personalized recommendations which stimulate consumer'

interests in the product or service. At the evaluation and decision-making stages, voice shopping agents are proved to boost consumers' willingness to buy by expediting the process and providing accurate information to meet consumer demands. Several studies have also demonstrated that AI enabled shopping can improve customers' purchasing volume and intention by utilizing the efficiency and personalization throughout the purchase journey. At the post-purchase stage, AI agents facilitate the continuous engagement and loyalty of customers with services like follow-up communication, problem solving, and individualized recommendations. Human-like AI agents also foster the emotional bond between customers and their brand. AI could also contribute positively and negatively to customer purchase decision process. While the function of AI is providing easy shopping experience with fast response and useful recommendation to the customers, it might create an apprehension and fear on the manipulated consumer due to excessive personalization and persuasion. Emotional factors such as reduced cognitive load, arousal, anthropomorphism, and trust are found to be significant drivers to explain customer responses toward AI voice agent's recommendations.2.4. Trust, Privacy, and Ethical Considerations in AI Voice Interactions [4][11][12] [7][8][13] [3][17][18] [22][29][31] [22][29] [1][6][11] [8][14][15] [2][3][28]

The increasing use of AI voice assistants raises important concerns regarding trust, privacy, transparency, and ethical implementation. [4][11][12] [22][29][31] [22][29] [1][6][11]

2.4 Trust, Privacy, and Ethical Considerations in AI Voice Interactions

Trust, privacy, and ethics are among the most important concerns related to AI voice assistants in customer interactions. As AI systems become more involved in customer communication and purchase decision-making, customers are becoming increasingly concerned about how these systems operate, collect data, and influence behavior. Trust plays a critical role in determining whether customers are willing to rely on AI voice agents for shopping, recommendations, and customer service activities. [4][11][12] [3][17][18] [22][29][31] [1][6][11] [2][3][28] [26][45]

2.4.1 Theoretical Foundations of Trust Development

Trust development in AI voice interactions is influenced by both emotional and cognitive factors. According to theoretical models such as the Heuristic-Systematic Model (HSM), customers develop trust based on perceived competence, usefulness, transparency, and emotional comfort during interactions. When it comes to trusting AI systems, accuracy is critical. If a system provides correct information, reliable recommendations, and works as expected time after time, customers are likely to believe it. [4][11][12] [2][3][28] [26][45]

Social presence, which also impacts trust development, comes from how the system interacts with the customer. Having anthropomorphic features and communicating in a human-like manner helps

make AI seem trustworthy and engaging. Customers often respond positively and perceive AI with warm, competent and conversational tones as more reliable. [4][11][12] [8][14][15] [26][45]

Customer's experiences with AI over time are also important to trust building. Customer experience, particularly the satisfaction or dissatisfaction gained from an interaction, has been identified as an element that will encourage or discourage usage. Customers become more likely to trust a system that has been responsive to their needs, and continued use will build that trust further. Conversely, poor recommendations, failed communication or unreliable functionality will erode customer trust and lower acceptance. It's important, therefore, for businesses to maintain consistent quality, transparency, and reliability to sustain customer trust over the long term. [4][11][12] [2][3][28]

2.4.2 Privacy Concerns and Data Security Challenges

A major barrier of the acceptance and usage of AI voice assistants concerns privacy. When people interact with an AI system, the system has to collect, store and process data such as voice recordings, history of purchases, and other personal information and behaviors. Many customers are skeptical about the collection, use and storage of this data and about whether conversations can be recorded. [3][17][18] [22][29][31] [1][6][11] [26][45]

In particular, the lack of transparency in the collection, use and storage of personal data reduces customer trust in the AI technology and the unwillingness to use the system if the data are used inappropriately or stolen. [22][29][31] [1][6][11]

In order to win customers' trust and adoption, it is vital that businesses have a secure data protection system, a way to store the data safely, and transparency on the ways it is collected and used. [4][11][12] [22][29][31]

2.4.3 Ethical Implications and Fairness Consideration

The ethical implications include manipulative suggestions, lack of transparency and unfair treatment of the customers. Customers increasingly expect that an AI system offers them fair recommendations, rather than employing manipulative selling tactics to gain revenue for the business. [22][29] [1][6][11] [2][3][28] [26][45]

Also, the possibility of unfair treatment because of the data collection patterns and the risk of manipulation and unfair recommendations can deter customers. For example, customers might not feel comfortable with the idea that the AI is overly persuasive or has a manipulative communication style, especially without a transparent explanation on how it works. [22][29] [2][3][28] [26][45]

Transparency and accountability in the design and use of the system are therefore important. Businesses should ensure that AI systems provide fair treatment to the customers, avoid manipulative

suggestions and can explain their recommendations and interactions. [4][11][12] [22][29] [2][3][28] [26][45]

2.5 Empirical Evidence and Performance Metrics of AI Voice Agents in Sales

Empirical research demonstrates clear advantages for using AI voice agents to improve business performance, operational efficiency, and customer satisfaction. Research reveals a substantial improvement in the conversion rate, customer engagement and performance for AI voice systems in various industries. [33][34][35] [1][6][11] [6][13][17] [18][36]

AI voice systems can obtain a higher conversion rate during sales than normal methods due to following factors: Quick response time of the AI system can reduce the waiting time and increases the user interaction. AI voice systems provide recommendations and suggestions to the user according to their interests and behaviour. The voice systems can give a quick conversational speed that will enable businesses to interact with customer quickly. The AI systems are improving with time due to ongoing optimization [33][34][35].

The systems can increase the customer satisfaction as well in many aspects: natural conversational system which allow user to communicate more naturally with the system. Instant problem resolution can make the customer more satisfied. Systems provide constant support 24/7 which allow customer to interact with the system anytime. It significantly reduces the cost as many of the customer service processes can be automated [18][36][26][45].

There are a set of important performance measures which can measure the efficiency of the AI voice agents, these measures are: conversion rate is a rate of users successfully converting to sale. Connection rate measures that rate how the AI voice agent connects with the user. Voice quality ensures that the voice can sound natural and it will give a better user experience. Personalization measure shows how well the system performs by tailoring their interaction towards customer's needs. There is also a set of performance measure: first-call resolution rate, average handling time, customer satisfaction, and cost reduction [1][6][11].Specific industry studies for the finance, health care, hospitality, retail and e-commerce sectors indicate that AI voice systems boost operational efficiency, customer interaction and revenue.

2.6 Future Research and Implementation Challenges

Though benefits of AI voice agents are numerous, there are still some gaps and implementation challenges within the research. Studies currently lack a combined perspective that bridges the research topics across various disciplines of marketing, psychology, and information systems into unified theoretical frameworks. [1][6][11]

Additional studies also need to be conducted on: Long-term customer behaviors, Cultural variations of the adoption of AI, Overtime relationships between human and AI trust, Emotional feedback toward AI, and Cross-cultural validity of findings.

Some of the remaining issues that research will face include the technical challenges of delays in response, factual accuracy, limited emotional intelligence of AI systems, as well as issues with multimodal integration. Ethics, regulation, privacy, transparency, algorithmic bias, and data security continue to pose a global threat and an implementation challenge. Researchers further argue that improved evaluation systems, anthropomorphic design and a more human-centered model of communication will be required. It is expected that further development will include a convergence with other future technologies like augmented reality, blockchain, predictive analytics, and integrated systems for omni-channel customer experience. Overall, a balance between technical proficiency, user trust, emotional comfort, and ethical responsibility is deemed important by most researchers.[4][11][12] [22][29][31] [22][29] [26][45]

CHAPTER 3: RESEARCH METHODOLOGY

Research methodology is an indispensable aspect of any research study, as it elaborates on the processes and methodologies employed in data collection, analysis, and interpretation. Such techniques help ensure a systematic, reliable, and objective study. This research study, "The Impact of AI Voice Agents on Customer Perception and Purchase Decisions," focuses on the evaluation of AI voice agents' effects on customer behavior, trust in AI, purchase concerns, and sales outcomes in various sales funnels stages. [4][11][12] [3][17][18] [33][34][35] [1][6][11]

Furthermore, it intends to examine the influence of AI voice agents on customer interaction, purchase decisions and to support business communication. Given the increasing use of artificial intelligence-based communication system in sales and customer services, this study aims to offer a research and operational understanding on how customers response to AI voice agent-based communication. [1][6][11]

The study process has addressed research design, process of collecting data, sampling method, instruments used for collecting data, analytical instruments, and statistical methods used for interpretation of the collected data.

3.1 Research Design

The present research is descriptive and analytical. A descriptive research design was adopted to identify the customer perceptions, opinions, and behaviors that are affected by AI voice agents. The analytical technique helped to determine relationships between multiple factors, including trust in the AI, the quality of the communication, purchase consideration, and customer comfort while making the purchase decision. [4][11][12] [3][17][18] [1][6][11]

The research seeks to highlight the patterns, the attitudes and the behaviors of the customers regarding interactions with AI-powered sales channels. It also helps in measuring the effectivity of AI voice agents at different stages of the sales funnel such as in the awareness, the consideration and final purchase stages. [3][17][18] [1][6][11]

Both quantitative and interpretive analysis have been utilized. Quantitative measures assist in numerically representing the customer responses. Interpretative methods are used to establish the business implications and patterns of the customer behaviors.

3.2 Sources of Data Collection

Both primary and secondary data collection methods were incorporated to ensure an equitable and extensive understanding of the subject matter.

3.2.1 Primary Data Collection

Primary data refers to the original information that is obtained directly from the respondent for a research study purpose. In this case, the data has been gathered using a structured questionnaire survey. The survey was developed considering the objectives and limitations of the research study.

The dataset collected for the study included multiple important attributes about customer perception and experience with AI voice agents. Attributes included customer familiarities with the AI voice agent (indicating how experienced they are), customer human likeness in their perception of communication (indicating if the customer finds AI natural in its response and interaction with customers), and customer perceived comprehension of AI (indicating the extent to which they feel the AI understood their statements and answers), customer naturalness in their flow of AI conversation (indicating if their interaction feels smooth), and customer belief of the given information from the AI (indicating how trustworthy they believe the given answer and recommendation is), customer purchase intention and comfort with purchasing via AI voice agent, and comparison of customer experience with AI voice agents compared to the experience with human agents.

The study also investigated customer annoyance with AI calls, and perceived impact of AI purchase.Majority of the questions were based on a Likert Scale to quantify the response on a scale that is based on customer's perception and opinion. Online distribution of the questionnaire was conducted via various online channels such as Google Forms. Students, working professionals, and individuals with previous experience of AI voice or automated services were the subjects of this survey.

Online distribution was deemed more cost-effective and faster. This enabled quick retrieval of a large number of survey responses, which were used to generate both statistical information and analytical insights.

3.2.2 Secondary Data Collection

Secondary data, from various sources of useful and helpful information, were collected to enhance the researchers' understanding of AI voice technology and customer behavior. Examples of such sources include research papers, academic journals, industry reports, business articles, online databases, and numerous others of published studies and reports regarding AI voice systems and customer purchasing behavior. The usage of secondary data aided in accumulating existing knowledge, findings and expert opinions from various researchers and organizations who study this area of research.

The usage of secondary research mainly contributed to the development of an understanding based on pre-established theoretical frameworks and findings from other sources already available, while

supporting the literature review by assisting the identification of significant trends, concepts, and correlations between AI voice agents and customer behavior and providing valuable background information on the matter. In this context, by using these different sources, the research was able to compare and present different viewpoints in relation to how AI communication technology is used and accepted by customers within present-day business contexts.

A significant number of theories were drawn from the literature review to explain customers' perceptions and decision-making toward the use of AI voice agents: the Technology Acceptance Model (TAM) explained how customers will accept and use a certain technology [7]; the Heuristic-Systematic Model (HSM) explored the way how human process information and makes decision [4]; the Behavioural Reasoning Theory (BRT) helped explain the reasons of customer behavior and decision-making; the Elaboration Likelihood Model (ELM) explained how persuasion can influence customers' attitude towards something [8]; the CASA Paradigm investigated people's social reaction to computers and humanlike agents [13]; and finally, the Persuasion Knowledge Model (PKM) explained how customer understand the persuader's persuasion strategies and knowledge [1].

3.3 Sampling Method and Sample Size

The sample was selected by Convenience sampling method, as the accessible population can be easily approached and sampled. The survey questionnaire was largely circulated using social media websites, personal networks and the internet. The sample had a total size of 94. The members of the sample had various ages and came from different working sectors, and professions (students and working people) thus enabling varied opinions to be collected. However, this method may introduce sampling bias, as the sample over-represents younger, digitally-literate individuals (students) and may not be generalizable to older or less tech-savvy populations.

3.4 Data Preparation and Cleaning

The responses were taken from the questionnaires which were completed by the respondents, these questionnaires were scanned, for inconsistencies and gaps, they were cleaned up and restructured in Microsoft Excel. The clean data was then imported into Python.

The clean data was uploaded to the Python Google Colab notebook using relevant python modules, so that analysis could be performed, data could be visualized, all variable names was transformed into a better format for statistical analysis.

3.5 Tools and Software Used

A variety of Python programming language tools and modules were utilized in conducting statistical analyses for this study, largely on the Google Colab environment. The Python programming language was chosen as the preferred language for its efficient capacity to conduct data analysis, statistical computation, visualization and machine learning operations. Google Colab was chosen for the fact that it provides a convenient, quick, and efficient method of running python code, manipulating data, and carrying out sophisticated statistical operations without requiring extensive local hardware or resources.

Critical python modules were involved in the research process as follows; pandas was used for data collection, compilation, cleaning, and manipulation enabling more convenient and efficient handling of extensive data sets, NumPy was utilized for numerical computation and calculation; for example using array and matrix operations, matplotlib and seaborn was used to visualize the data with graphs, charts and plots so as to enhance its understanding of patterns. SciPy was used to carry out scientific and statistical computations; statistics tests and regression analyses were done with statsmodels, while machine learning and predictive analytical operations was done using scikit-learn.

Factor Analyzer was beneficial when doing factor analysis as it helped detect patterns that existed within the variables in the dataset, also pingouin was employed to carry out advanced statistical analysis and tests.The above-mentioned Python modules were utilized to handle and organize data, for visualization, for testing various hypotheses, for determining relationships between variables using correlations and regression analyses, for identifying inherent patterns using factor analysis, and for analyzing different stages of the sales funnel.

3.6 Statistical Techniques Used

Various statistical methods and analyses were employed in the current research study to examine customer feedback. The methods used include:

1. Descriptive Analysis: Used to present basic descriptions and demographic characteristics of the respondents. Various charts and graphs were employed to exhibit the responses and patterns shown by the customers.

2. Reliability Testing: Cronbach's Alpha test was used to analyze the internal consistency and reliability of the questionnaire. A high Cronbach's alpha score would indicates that the scale used to collect data is statistically reliable.

3. Correlation analysis: Pearson correlation was utilized to explore the relationships between various customer behaviors with each other: Trust and consideration toward purchases, naturalness and influence, smooth flow and trust, AI understanding of products and purchase behavior. Correlation

coefficients are computed that indicated how strongly two variables are related to each other and direction of the relationship (positive or negative). [4][11][12] [3][17][18]

4. Hypothesis Testing: various hypothesis are tested based on the information that has been collected, to conclude whether AI voice agents have a significant effect on the perceptions and purchasing decisions. Pearson Correlation analysis was primarily used for hypothesis testing. [1][6][11]

5. Regression Analysis: Multiple Linear Regression was used in this research to study the effect that different variables has on customer purchase consideration and purchase comfort. This shows how independent variables predict behavior of customers toward purchasing decision, if it was confirmed from hypotheses that correlation exists between different variables. [3][17][18]

6. Bootstrapping analysis: The purpose of the bootstrapping technique is to provide an empirical measure of variability for each coefficient of the regression and to verify the robustness of the model estimates across multiple samples. It generates more stable and reliable estimates of the coefficients than a standard one-time calculation would otherwise do.

7. Factor Analysis: Factor analysis was used to simplify complex relationships between numerous survey variables by reducing them to a few underlying latent factors. This analysis enabled the grouping together of similar variables to provide insight into the common underlying issues impacting customer experience with AI voice agents. [1][6][11]

8. Group Comparison analysis: T-test and Chi-square analysis were conducted between groups of respondents to find significant associations among the variables and also among different customers to see how their opinions vary depending on their age group and career background.

9. Sales Funnel analysis: Analyzing sales funnel helps to assess and compare the effectiveness of the AI voice agents at various stages of the sales journey, namely: awareness, consideration and final purchase. Average scores for each of the sales funnel stages were calculated, to determine the role and contribution of the AI voice agents throughout these stages.3.7 Limitations of the Study [3][17][18] [1][6][11]

3.7 Limitation

While this study sheds light on important insights into AI voice agents and customers behavior, there are few limitations that should be mentioned: [1][6][11]

- The size of the sample consists of 94 respondents only.
- Mostly convenience sampling was used.
- Response based on customer opinion and personal judgment.
- Conducted within a shorter duration of time.

- Customers behavior is likely to differ depending on the industry and country of location.

Notwithstanding these limitations, the study has made an insightful contribution in understanding the efficacy of AI voice agents in today's business sales and communication settings. [1][6][11]

3.8 Conclusion to Research Methodology

This research methodology applied helps in analyzing the effects of AI voice agents on customer perception and purchase intentions. This uses both primary and secondary research and utilizes advanced statistical tools like python, to give both the practical and theoretical aspects of customers behavior toward AI voice technology. Application of multiple statistical methods like correlation analysis, regression analysis, hypothesis testing, bootstrapping, factor analysis and sales funnel analysis, the findings are reliable and accurate. Hence this methodology helped to obtain accurate data required in achieving research objectives. [3][17][18] [1][6][11]

CHAPTER 4: ANALYSIS, DISCUSSION AND RECOMMENDATION

4.1 Data Collection (Sources and Approach)

Data collection is an important part of every research study because the quality of research findings depends on the quality of data collected. In this study titled “Impact of AI Voice Agents on Customer Perception and Purchase Decisions”, both primary and secondary data collection methods were used to understand how AI voice agents influence customer behavior, engagement, trust, and purchase decisions. [4][11][12] [3][17][18] [1][6][11]

The investigation aimed at understanding how customers use AI voice agents at each level of the sales funnel including awareness, consideration, purchase decision and after sales service. The study aimed at customer satisfaction, personalization, communication quality and privacy. [3][17][18] [22][29][31] [1][6][11] [18][36] [26][45]

4.1.1 Primary Data Collection

Primary data was gathered directly from the respondents through an interview-based questionnaire survey. The questionnaire was formulated in a clear, understandable and simple language so that the respondents from varied backgrounds could understand it without any difficulty.

This questionnaire was composed of both closed-ended and opinion-based questions. These questions are aimed to gain insights on the customers perception, experience, and attitudes toward AI voice agents. Customer awareness towards AI voice agents, frequency of customer interaction with AI, level of trust towards AI recommendations and customer satisfaction toward the communication with AI are part of the questions. This questionnaire also examined the impact of AI on customer purchasing decisions and customer opinion toward AI agents versus human representatives were explored.

Moreover, quality of personalization and recommendation from AI systems and customer concerns over security and privacy issues are also part of the question. The questionnaire also raised general customer perception towards AI systems on the rise in sale and customer service environments with different form of questions which includes closed-ended questions and opinion-based questions so that both quantity data and opinion-based data from customers were gained.

The questionnaire was administered on the Google forms because it is cost-effective and time-saving while efficiently collecting large number of answers from customers. The question was disseminated through social media, online communities and networks to recruit a wide range of respondents including students, working professionals, online shoppers and general internet users who have been using AI based customer service or voice assistants before. All participants answered this survey voluntarily and were asked to report answers that were truthful and objective. [1][6][11]

Once all the survey data was collected and confirmed, both duplicate responses and missing answers were excluded so that reliability of the data set is maintained. Final data set was organized systematically and made available for statistical analyses. The primary research was used to understand the true experience of customers, trust of customers, customer comfortability, and influence of AI voice agents in customer buying behavior. [4][11][12][3][17][18][1][6][11]

4.1.2 Secondary Data Collection

To enhance and build knowledge about AI voice technology and its implementation in the business and sales context, secondary data were gathered from multiple reliable and pre-existing sources. Research papers, academic journals, industry reports, published articles, conference papers, books, online databases, and business case studies were among the secondary sources. Use of secondary data allowed gathering of pre-existing knowledge, professional views, empirical evidence, and theoretical ideas related to AI voice agents and consumer behavior.

By studying the secondary research it enabled a better understanding of both theoretical and practical implementations of AI voice technology within business contexts. It enabled to understand the way companies utilize AI voice systems in customer services, sales communication, and marketing tasks. The selected literature also gave insights to the potential of the technology and its advantages and disadvantages in improving customer experience and business efficiency.

A number of essential theories were explored and analyzed in order to support the research and understand consumer attitudes toward AI systems. The Technology Acceptance Model (TAM) explored the ways by which new technology would be accepted by consumers based on the principles of perceived usefulness and perceived ease of use. Also study of The Uses and Gratifications Theory (UGT) help to identify why customers interact with AI systems and what kind of satisfaction and value they derive from it. Behavioral Reasoning Theory (BRT) helped explain behavior based on reasons and argumentation, while Heuristic-Systematic Model (HSM) analyzed information processing during interaction with AI systems.

The Stimulus-Organism-Response (S-O-R) Model was employed to examine how external stimuli, such as human-like interactions with AI systems, affect human emotions and subsequent behavior. In addition, the Anthropomorphism Theory explored the human tendencies to relate the concept of a conscious agent to non-living objects and creatures; to think of an inanimate thing or entity as being like a human. All these theories were useful for examining customer trust, perceived usefulness, emotionality and behavioral responses toward the usage of AI voice agents. [4][11][12][26][45]

Through analysis of secondary data many advantages and disadvantages were recognized when working with AI voice agents. Some advantages of AI systems identified were the opportunity of engaging customers better, providingpersonalizedrecommendations and enhancing business operational efficiency. At the same time the limitations researchers found, included privacy, ethical issues, lack of emotions and no ability to understand humans and complex conversations. [22][29][31][22][29][1][6][11][6][13][17]

4.1.2 Research Approach

In order to broaden and increase our knowledge and understanding of AI voice technology and the implications of AI voice technology in the context of business and sales activities, secondary data was collected. This secondary data was gathered from a variety of trusted and already existing resources, such as research papers, academic journals, industry reports, articles published in magazines and on the web, conference papers, books, databases, and business case studies. In essence, by using secondary data sources, we were able to gather existing knowledge, expert opinion, factual findings and theoretical ideas pertaining to AI voice agents and customer behavior.

Our examination of secondary research revealed the nature of the theoretical and practical application of AI voice technology in business organizations, in particular identifying ways in which businesses apply AI voice agents in customer support, sales communication and marketing activities. Literature reviewed offered critical insights into the pros, cons and future potential applications of AI voice technology within business organizations, to facilitate improvement of both customer experience and operational performance, and provided a grasp of industry trends, customer expectations and challenges related to AI communication systems.

Various important theories were reviewed and explored which aided our understanding of the topic. The Technology Acceptance Model (TAM) which indicates that customers accept and adopt new technology based on usefulness and ease of use, and The Uses and Gratifications Theory (UGT), which provided an explanation on the underlying reasons of customer engagement with AI agents and the resulting value, satisfaction and benefit they acquire was used to establish why customers interact with AI agents and what type of value and satisfaction is attained. The Behavioral Reasoning Theory (BRT), which explained customer behavior through a decision-making process, and the Heuristic-Systematic Model (HSM) which explained how individuals process information in the face of AI systems, were also investigated and explored to aid the study and enhance our understanding of customer attitudes and behaviors in relation to new technology.

Finally, The Stimulus-Organism-Response (S-O-R) Model and Anthropomorphism Theory, the latter pertaining to the assigning of human traits, emotions and personality to non-living or technical objects

such as AI voice agents, were analyzed so as to better comprehend the response of the customer based on stimuli, their emotion toward an AI agent, and the final reaction toward the human like nature of AI voice technology and consequently, customer behavior. These theories allowed for analysis of customer trust, perceived utility, affective connection, communication experience, and customer behavior toward using AI voice agents. [4][11][12][26][45]

As part of our analysis of secondary data, various pros and cons relating to AI voice agents were identified. Pros such as improved customer interaction and communication, increased personalization, high customer service responsiveness and better operational efficiency for businesses, among others, were reported in the literature. The reduced operating cost and constant availability of customer service to businesses also proved beneficial, as did support to businesses during low availability. However, some critical limitations to AI voice technology that were recognized include privacy issues, ethical considerations, poor emotional intelligence and difficulty in understanding and interpreting complex human emotions and speech. [22][29][31][22][29][1][6][11][6][13][17]

4.1.3 Data Analysis Method

Once all the responses were collected, they were organized and cleaned meticulously, and the data analysis was carried out in an organized manner for the validity and reliability of the data, concentrating primarily on various crucial areas related to AI voice agents and customers. These were customer trust towards AI system, AI impact on customer purchase intention, customer engagement, communication efficiency, customer satisfaction level while interacting with AI voice agents.

Furthermore, the comparison between AI voice agents and human representatives was studied to determine customer perceptions and preferences about both the types of communication; effectiveness of AI voice agents through the entire sales funnel; interaction of customers, conversion of lead, purchase facilitation; also, ethical concerns related to AI systems, concerns about data privacy, and responsible usage of the AI systems, were taken into consideration. The analysis of combined data, both primary and secondary, was done to derive conclusive and strong arguments concerning AI voice agent effectiveness in business and sales sectors today; by integrating customer responses with existing academic researches and industry trends, a comprehensive understanding of the advantages, challenges, and impact of AI voice agents on customer engagement, communication and shopping behavior in the contemporary context has been obtained. [1][6][11]

The entire data collection process not only contributes to a practical understanding of the research topic but also aids in a theoretical comprehension of the subject under investigation. Primary data aids in comprehending actual customer reactions, attitudes, emotions, trust, and behavioral intentions

towards AI voice systems, while secondary data provides a sound academic foundation of AI technologies, theoretical perspectives, industry experience and previous findings regarding AI technology and customer interaction. Combining these research methodologies helped to obtain and strengthen the reliability, thoroughness and accuracy of the findings, aiding the researcher in better achievement of the research objectives by providing a broad understanding of the effect of AI voice agents on customer communication, engagement, satisfaction and shopping behaviors.

4.2 Data analysis

In this chapter, the data that has been collected to the research project named 'The Effect of AI Voice Agents on the Perception and Purchase Behavior of Customers in Sales Interactions' are described and analyzed. The objective of this chapter is to understand the perceptions, trust, satisfaction, communication experience and purchase behavior of customers on the AI voice agents utilized in the process of sales.

Data for the study was collected through the means of a questionnaire which was circulated amongst the respondents belonging to varying demographics. A structured questionnaire containing various questions on the customer's perception of the technology, their communication with the system, convenience, personalization, trust, satisfaction and their purchase intentions with AI voice agents, was used for data collection. The collected answers were compiled and analyzed systematically.

Various methods and techniques of statistics were employed in the process of data analysis. Descriptive statistical techniques like frequency, percentages, mean, and standard deviations were used to understand the responses of the customers on the variables and the pattern of the data as a whole. Various graphs and charts like pie charts, bar charts and histograms were also used.

Advanced techniques of statistics were used to test the relationship between various variables. A reliability analysis was conducted on the questions asked to the customers using Cronbach's alpha test. Correlation analysis was used to analyze the relationship between customer trust, effectiveness of communication, customer satisfaction, and purchase intentions. Regression analysis was employed in order to analyze the effect of AI voice agents on the purchase behavior and decisions of the customers.

Various customer preferences between the use of AI voice agents and human in the sales funnel were also examined. This analysis of the variables involved would also aim to ascertain at what stage of the sales funnel, the customers were more comfortable using the AI voice agents and human interaction still takes precedence over AI.

The chapter has been divided into various parts for clarity and a better understanding of the research. The different sections are: demographic analysis, descriptive analysis, reliability testing, correlation

analysis, regression analysis, and hypothesis testing. The explanations and interpretations of all the statistical outputs are done to have a clear idea of the findings.

4.2.1 Data Preparation and Library Import

We start by loading the necessary Python libraries and then uploading the survey data into the Google Colab environment. The libraries are utilized to manipulate, visualize and perform statistical analyses that determine the role of AI voice agents on customer attitudes and purchase decisions.

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

from scipy.stats import pearsonr
from scipy.stats import ttest_ind
from scipy.stats import chi2_contingency

from sklearn.preprocessing import LabelEncoder

import statsmodels.api as sm
import statsmodels.formula.api as smf

from factor_analyzer import FactorAnalyzer
from pingouin import cronbach_alpha
```

Figure 4.1: Python libraries imported for data analysis

After importing the necessary libraries the survey data was imported to python to perform analysis. The data was in excel file format which was then read with Pandas library. By looking into the data we understood the structure of the data along with the variable taken in to study and if the responses are read properly in order to analyze it.

```
from google.colab import files
uploaded = files.upload()
```

```
df = pd.read_excel("RESPONSE.xlsx")
```

Figure 4.2: Importing the dataset into Python for analysis.

```
df.head()
```

	Age:	Occupation:	received_ai_call	identified_ai	ai_human_like	ai_understanding	smooth_conversation	trust_ai_information	data_privacy_concern	purchase_consideration
0	21–25	Student	Yes	Yes	5	4	3	5	3	1
1	21–25	Student	Yes	Yes	4	3	5	3	5	4
2	26–30	Working professional	Yes	No	5	4	5	4	3	4
3	21–25	Student	No	No	1	1	1	3	3	3
4	21–25	Student	Yes	Not sure	4	3	4	4	4	2

Figure 4.3: Preview of the survey dataset used for analysis.

The dataset preview showcased the initial records in the accumulated survey responses. It contained variables from demographic data and from the aspects of customer attitude, belief in, communication ease, purchase intention, and actual purchase towards AI voice agents. Visualizing the dataset at this point helped to ensure data was imported and was appropriate to the next stage.

4.2.2 Data Cleaning and Preprocessing

The data file was first cleaned up and processed using Microsoft Excel then imported to Python. These cleaning and processing step include delete missing values and response, correction of data type, and modification of column names. This step makes sure the file is well structured and ready to use for statistical analysis.

Once the data file was imported in Python, it was first check that all variables are entered correctly to make sure all responses are entered in a correct structure of variable. The file was checked for any inconsistency and well formatted before conducting graphical and statistical analysis. The dataset is relatively clean and little work is needed for preprocessing data in Python.

4.2.3 Dataset Preview

```
df.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 94 entries, 0 to 93
Data columns (total 17 columns):
 #   Column                    Non-Null Count  Dtype
---  ------                    --------------  -----
 0   Age:                      94 non-null     object
 1   Occupation:               94 non-null     object
 2   received_ai_call          94 non-null     object
 3   identified_ai             94 non-null     object
 4   ai_human_like             94 non-null     int64
 5   ai_understanding          94 non-null     int64
 6   smooth_conversation       94 non-null     int64
 7   trust_ai_information      94 non-null     int64
 8   data_privacy_concern      94 non-null     int64
 9   purchase_consideration    94 non-null     int64
 10  prefer_human_agent        94 non-null     int64
 11  ai_calls_irritating       94 non-null     int64
 12  irritation_reason         94 non-null     object
 13  no_purchase_reason        4 non-null      object
 14  ai_product_understanding  94 non-null     int64
 15  ai_purchase_influence     94 non-null     int64
 16  comfort_final_purchase    94 non-null     int64
dtypes: int64(11), object(6)
memory usage: 12.6+ KB
```

Figure 4.4: Information and structure of the survey dataset.

After importing into python, the data structure of the dataset was investigated using df.info(). It appears there are 94 survey answers and 17 variables relating to customer perception, trust, communication experience, privacy concerns, purchase factors, and interaction experience. The variables measured are those about customer experience with an AI voice agent.

Categorical variables, such as age, occupation, reception status of call, and reasons for irritation have been stored as 'object' data types. This is appropriate as the values for these variables represent categorical information gathered from a survey response. Variables relating to customer opinions and attitudes, however, have been stored as 'int' data type, which reflects the numerical data collected via rating scales.

The data summary indicates there are 94 non-null values for all the variables, which indicates the dataset is almost entirely complete. An exception is 'no purchase reason', which indicates fewer than 94 respondents. However, this simply reflects how questions that are conditionally asked in survey responses would be observed.

The structure of the data provides evidence the data have been properly imported into python. From here the dataset is ready for further statistical analysis and modeling techniques.

4.2.4 Demographic Analysis of Respondents

This is to analyze the demographic backgrounds of the respondents selected for this study in order to describe the population within the study sample. Also to investigate which of the demographics is already aware of and accustomed to interacting with an AI voice agent. Analysis was done on both age and occupation, to analyze the distributions of the subjects that were involved.

Age Distribution of Respondents

The age distribution analysis was performed to identify the different age groups participating in the study and to understand which age category had greater exposure to AI-based sales interactions.

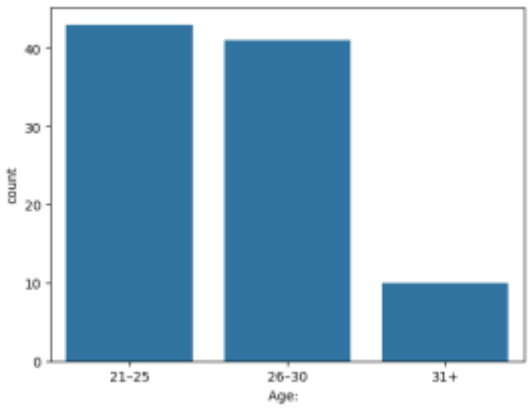


Figure 4.5: Age distribution of the respondents.

Above is the age wise classification of the respondents included in the study. It can be clearly seen from the above bar graph that majority of the respondents were of the age group 21-25 and 26-30 years. Less than the above amount of respondents were of more than 31 years of age.

It indicates that major chunk of the respondents who participated in the survey were younger in age. Since older age groups have least acquaintance and familiarity to digital technologies and AI based communication system, the opinion of respondents of the younger age groups were taken in consideration in order to assess consumer attitudes towards AI voice agents in sales. [1][6][11]. The results suggest that the response are representing those digitally inclined individuals and this segment is the one most likely to engage with AI-based customer communication systems.

Occupation Distribution of Respondents

Figure 4.4: Occupation Distribution of Respondents

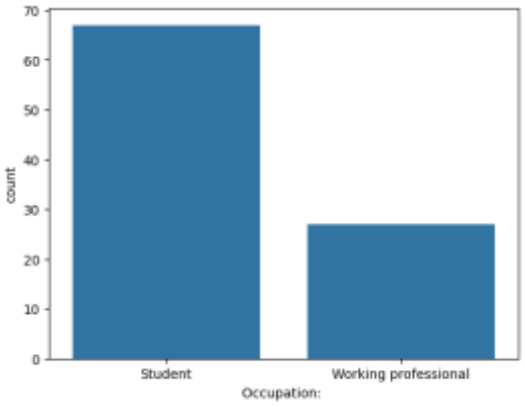


Figure 4.6: Occupational distribution of the respondents.

The above diagram shows the occupational distribution of respondents involved in the study. Students comprised of the larger majority of the respondents and were mostly complemented by working professionals. The presence of the higher percentage of students signifies that the sample is primarily a younger and digitally-oriented population who would have more access to online systems and AI communications tools. Simultaneously, data from working professionals would provide further practical data in terms of how consumers interact with AI voice agents during practical buying and service transactions.

4.2.5 Reliability Analysis

Reliability analysis was performed on the questionnaire used in the research in order to assess the internal consistency of the survey. Cronbach's Alpha test was conducted in order to check whether the items related to customer's perception, trust, communication quality, purchase considerations and interaction with AI were measuring the same things in a reliable way. The reliability analysis is a part of the statistical analysis, which measures if the received responses are reliable to be further analyzed.

```
# Relaibility Test
likert_cols = [
    'ai_human_like',
    'ai_understanding',
    'smooth_conversation',
    'trust_ai_information',
    'purchase_consideration',
    'prefer_human_agent',
    'ai_calls_irritating',
    'ai_product_understanding',
    'ai_purchase_influence',
    'comfort_final_purchase'
]

cronbach_alpha(df[likert_cols])
```

```
(np.float64(0.8533925978044183), array([0.805, 0.894]))
```

Figure 4.7: Reliability test using Cronbach's Alpha.

The Cronbach's Alpha from the reliability analysis yielded a value of 0.853. Cronbach's Alpha score that is higher than 0.70 are accepted in statistic research, while a score of higher than 0.80 shows a good internal consistency within variables.

The finding revealed a strong internal reliability and relation between the questions of the study. Therefore, the responses collected from the participants were internally consistent and appropriate for advanced statistical analyses, including correlation analysis, regression analysis, factor analysis, and hypothesis testing. The reliable results demonstrate that the questions of AI communication, customer trust, purchase influence, and interaction quality are effective at assessing customer perception of AI voice agent in sales encounter and thus were appropriate for further analysis.

4.2.6 Correlation Analysis

The correlation analysis was performed on the related variables about the AI voice agent and purchase behaviors in order to understand the direction and strength among them. Trust, smoothness of conversation, AI understanding and the variable regarding influencing purchase behaviors are analyzed whether they correlate positively or negatively by using the Pearson correlation analysis.

```
corr = df[likert_cols].corr()

plt.figure(figsize=(12,8))
sns.heatmap(corr, annot=True, cmap='coolwarm')
plt.show()
```

Figure 4.8: Python Code for Correlation Analysis

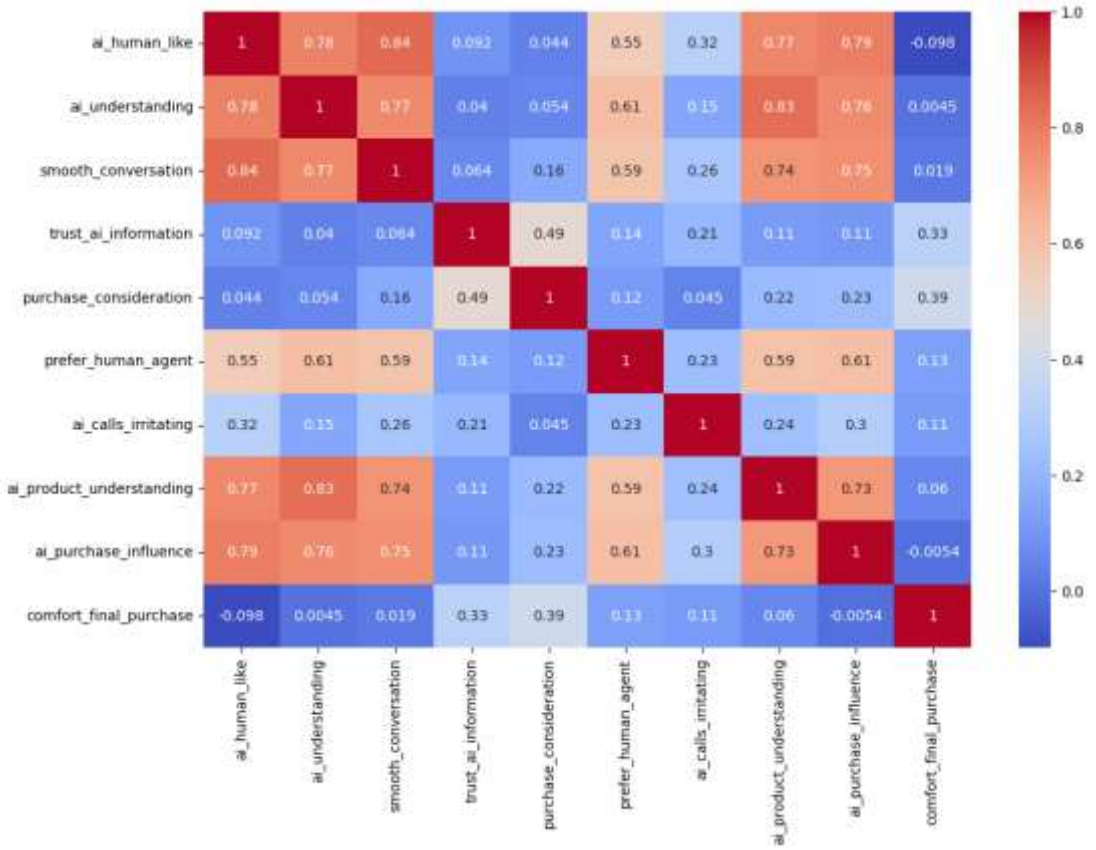


Figure 4.9: Correlation Heatmap of Variables

The correlation heatmap summarizes the intercorrelations between all the major variables that are part of the study. The numbers in the heatmap are between -1 and +1 and positive indicates a positive correlation between variables and negative indicates a negative correlation. The larger the positive number the strong is the correlation between two variables.

As is evident from the table there was a strong positive correlation between aihumanlike and smoothconversation with a correlation of 0.84. Thus customers who were able to rate the AI voice agent as more human-like had a smoother interaction. There was a strong positive correlation between aiunderstanding and aiproductunderstanding (0.83), which means that the customers felt that better AI understanding of concepts made for good understanding of the products by the customers.

There was a strong positive correlation between aihumanlike and aipurchaseinfluence (0.79), there was also a strong positive correlation between smoothconversation and aipurchase_influence (0.75), implying that human-like communication by an AI voice agent will make customers have higher purchase influence.

A moderate positive correlation was found between trustaiinformation and purchase_consideration (0.49), indicating that a trust in AI voice agent provided information does have influence on purchase consideration in the sale process.

From the heatmap one can also observe that the variable comfortfinalpurchase had relatively poor correlations with some of the variables that were part of the AI context. This indicates that though AI voice agent may play an influence role in awareness, communication, consideration etc the customers did not feel inclined to rely fully on the AI agent in the final purchase consideration stage. The variable ai_calls_irritating had also had relatively poor to moderate correlations with the other variables.

In short, the correlation analysis suggests a positive correlation between communication quality related variables of the AI voice agent and customer purchase behavior. However, it looks like AI voice agent will be effective only during earlier stage of the customer interaction but perhaps for final purchase a human interaction will be required.

Variables Compared	**Correlation Value**	**Interpretation**
AI Human-like & Smooth Conversation	0.84	Strong Positive Relationship
AI Understanding & AI Product Understanding	0.83	Strong Positive Relationship
AI Human-like & AI Purchase Influence	0.79	Strong Positive Relationship
Smooth Conversation & AI Purchase Influence	0.75	Strong Positive Relationship
Trust AI Information & Purchase Consideration	0.49	Moderate Positive Relationship
Purchase Consideration & Comfort Final Purchase	0.39	Moderate Positive Relationship
AI Calls Irritating & Purchase Consideration	0.04	Very Weak Relationship

Table 4.1: Correlation analysis of study variables.

The table above summarizes the major relationships identified through correlation analysis. The findings highlight that communication quality, trust, and AI understanding are important factors influencing customer perception and purchase consideration related to AI voice agents.

4.2.7 Hypothesis Testing

This section of tests used hypothesis testing to evaluate if relationships between variables that are concerned with AI voice agents and customer purchase were significant. Correlation analysis was done through using a Pearson's correlation to test the proposed hypotheses and determine the

significance between particular variables. The findings provide insight into whether the levels of communication, trust, the understanding by the AI, and purchase affect customer opinion and purchasing significantly.

4.2.7.1 Hypothesis 1

Statement of Hypothesis

H0: There is no significant association between AI voice agents and customer purchase decisions.
H1: There is a significant positive association between AI voice agents and customer purchase decisions.

Statistical Test Used

Pearson Correlation Test

```
#Hypothesis 1
# H0:AI voice agents do NOT influence purchase decisions.
# H1:AI voice agents positively influence purchase decisions.

pearsonr(df['trust_ai_information'],
         df['purchase_consideration'])

PearsonRResult(statistic=np.float64(0.5393532416514264), pvalue=np.float64(2.4308448854486466e-08))
```

Figure 4.10: Hypothesis 1 Output

Interpretation

Correlation analysis provided the result of correlation value as 0.539 with p value less than 0.05, representing the moderate positive and significant correlation between customers' trust towards AI information and purchase consideration. Hence, null hypothesis is rejected and alternative hypothesis is accepted. This finding indicates a significant positive association between trust toward AI-generated information and customer purchase consideration.

4.2.7.2 Hypothesis 2

Statement of Hypothesis

H0: There is no significant association between human-like AI communication and customer purchase behavior.
H1: There is a significant positive association between human-like AI communication and customer purchase behavior.

Statistical Test Used

Pearson Correlation Test

```
#Hypothesis 2
# H0: Human-like AI communication does NOT influence customer purchase behavior.
# H1: Human-like AI communication positively influences customer purchase behavior.

pearsonr(
    df['ai_human_like'],
    df['ai_purchase_influence']
)
```

```
PearsonRResult(statistic=np.float64(0.7890423943832167), pvalue=np.float64(5.8406141940644714e-21))
```

Figure 4.11: Hypothesis 2 Output

Interpretation

The correlation value calculated was 0.789 with a highly significant p value of less than 0.05. This shows that human-like AI communication and AI purchase influence are positively correlated. So the null hypothesis is rejected and the alternative hypothesis is accepted. These results imply that if the AI communication feels human-like, a stronger positive association is observed.

4.2.7.3 Hypothesis 3

Statement of Hypothesis

H0: Smooth AI conversation is not significantly associated with customer trust.
H1: Smooth AI conversation has a significant positive association with customer trust.

Statistical Test Used

Pearson Correlation Test

```
#Hypothesis 3
# H0: Smooth AI conversation does NOT affect customer trust.
# H1: Smooth AI conversation positively affects customer trust.

pearsonr(
    df['smooth_conversation'],
    df['trust_ai_information']
)
```

```
PearsonRResult(statistic=np.float64(0.08081851407347915), pvalue=np.float64(0.4412373186911971))
```

Figure 4.12: Hypothesis 3 Output

Interpretation

Correlation analysis resulted in a correlation of 0.081 with a p-value of >0.05. There appears to be a very weak relationship that is not statistically significant between smooth conversation and customer trust. So, we retain the null hypothesis and reject the alternative. These results suggest that smooth conversation on its own is not significantly associated with customer trust.

4.2.7.4 Hypothesis 4

Statement of Hypothesis

H0: AI product understanding is not significantly associated with purchase consideration.
H1: AI product understanding has a significant positive association with purchase consideration.

Statistical Test Used

Pearson Correlation Test

```
#Hypothesis 4
# H0: AI product understanding does NOT influence purchase consideration.
# H1: AI product understanding positively influences purchase consideration.

pearsonr(
    df['ai_product_understanding'],
    df['purchase_consideration']
)
```

```
PearsonRResult(statistic=np.float64(0.20839747315746895), pvalue=np.float64(0.0450059833055264 3))
```

Figure 4.13: Hypothesis 4 Output

Interpretation

The calculated correlation was 0.208 with p-value less than 0.05. There is a negative but weak significant positive relationship between AI product understanding and product purchase consideration. We reject null hypothesis and accept alternate hypothesis. AI product understanding shows a weak positive association with purchase consideration.

4.2.7.5 Hypothesis 5

Statement of Hypothesis

H0: AI purchase influence is not significantly associated with customer comfort for final purchase.
H1: AI purchase influence has a significant positive association with customer comfort for final purchase.

Statistical Test Used

Pearson Correlation Test

```
#Hypothesis 5
# H0: AI purchase influence does NOT affect customer comfort for final purchase.
# H1: AI purchase influence positively affects customer comfort for final purchase.

pearsonr(
    df['ai_purchase_influence'],
    df['comfort_final_purchase']
)
```

```
PearsonRResult(statistic=np.float64(-0.007382201201388647), pvalue=np.float64(0.9440110169237789))
```

Figure 4.14: Hypothesis 5 Output

Interpretation

An analysis resulted in a p-value of over 0.05 and a correlation of -0.007. This implies that the amount that the purchase is influenced by AI has no statistically significant affect on how comfortable the customer is with making a final purchase decision. This means that we fail to reject the null hypothesis and do not support the alternative hypothesis. The findings suggest that AI purchase influence does not show a significant association with customer comfort during the final purchase decision.

4.2.7.6 Hypothesis 6

Statement of Hypothesis

H0: AI sales call irritation is not significantly associated with purchase consideration..
H1: AI sales call irritation has a significant negative association with purchase consideration.

Statistical Test Used

Pearson Correlation Test

```
#Hypothesis 6
# H0: AI sales call irritation does NOT affect purchase consideration.
# H1: AI sales call irritation negatively affects purchase consideration.

pearsonr(
    df['ai_calls_irritating'],
    df['purchase_consideration']
)
```

```
PearsonRResult(statistic=np.float64(0.050230867114185236), pvalue=np.float64(0.63253670343913))
```

Figure 4.15: Hypothesis 6 Output

Interpretation

The correlation analysis showed a correlation of 0.050 with a p-value of >0.05. This indicates that AI call irritation had a very weak and non-significant relationship with purchase consideration, hence, null hypothesis was accepted while alternative was rejected..

4.2.7.7 Hypothesis 7

Statement of Hypothesis

H0: AI understanding capability is not significantly associated with customer trust.
H1: AI understanding capability has a significant positive association with customer trust.

Statistical Test Used

Pearson Correlation Test

```
#Hypothesis 7
# H0: AI understanding capability does NOT influence customer trust.
# H1: AI understanding capability positively influences customer trust.

pearsonr(
    df['ai_understanding'],
    df['trust_ai_information']
)

PearsonRResult(statistic=np.float64(0.03220007185381213), pvalue=np.float64(0.759295591453319))
```

Figure 4.16: Hypothesis 7 Output

Interpretation

For the above analysis, the calculated result was a correlation of 0.032 and p-value greater than 0.05. This proves that there is no or a very insignificant and very weak correlation between AI understanding capability and customer trust. Therefore null hypothesis is accepted and alternate hypothesis is rejected. It can be concluded that AI understanding capability alone does not show a significant association with customer trust.

4.2.7.8 Hypothesis 8

Statement of Hypothesis

H0: There is no significant association between preference for human agents and customer comfort during final purchase decisions.
H1: There is a significant association between preference for human agents and customer comfort during final purchase decisions.

Statistical Test Used

Pearson Correlation Test

```
#Hypothesis 8
# H0: Customers do NOT prefer human agents during final purchase decisions.
# H1: Customers prefer human agents during final purchase decisions.

pearsonr(
    df['prefer_human_agent'],
    df['comfort_final_purchase']
)

PearsonRResult(statistic=np.float64(0.12694984996540454), pvalue=np.float64(0.22527689138093726))
```

Figure 4.17: Hypothesis 8 Output

Interpretation

The correlation analysis has a correlation value of 0.127 and a p-value of>0.05, this shows that preference of human agent and customer comfort during making final purchase decision is weak and not significant. Therefore, null hypothesis is accepted and alternative hypothesis is rejected. This

shows that some customer still prefer interaction with human but the he relationship was not found to be statistically significant in this study.

Hypothesis	**Correlation Value (r)**	**P-Value**	**Result**
H1: Trust in AI has a significant positive association with purchase consideration	0.539	< 0.05	Accepted
H2: Human-like AI communication has a significant positive association with customer purchase behavior	0.789	< 0.05	Accepted
H3: Smooth AI conversation has a significant positive association with customer trust	0.081	> 0.05	Rejected
H4: AI product understanding has a significant positive association with purchase consideration	0.208	< 0.05	Accepted
H5: AI purchase influence has a significant positive association with customer comfort for final purchase	-0.007	> 0.05	Rejected
H6: AI sales call irritation has a significant negative association with purchase consideration	0.050	> 0.05	Rejected
H7: AI understanding capability has a significant positive association with customer trust	0.032	> 0.05	Rejected
H8: There is a significant association between preference for human agents and customer comfort during final purchase decisions	0.127	> 0.05	Rejected

Table 4.2: Hypothesis testing results of the study.

From the results of the hypotheses testing, it can be noted that the trust of AI information, human-like communication and the understanding of AI product have a positive effect on the customers buying behavior. In contrast, the results also reflect that the AI system is still unable to overcome certain shortcomings in the purchase phase and customers need human help in terms of their comfort and trust for the final purchase stage.

4.6 Regression Analysis

As derived from the hypothesis test results, it could be identified that AI information trustworthiness, human-likeness of the communication and the customers' understanding of AI product significantly influence the buying behavior. As the outcome from the hypotheses test results, on the other hand, the AI system still failed to deal with the problems in purchase phase and customers still requires human assistance in the aspect of comfortability and trust to the purchase process.

4.2.8 Regression Model: Factors Affecting Purchase Consideration

Objective of the Model

The purpose of the regression analysis was to determine the effect of communication quality, AI comprehension, trust, and product knowledge on customer purchase consideration during the AI-assisted sales process.

```python
#regression Analysis
X = df[[
    'ai_human_like',
    'ai_understanding',
    'smooth_conversation',
    'trust_ai_information',
    'ai_product_understanding'
]]

Y = df['purchase_consideration']

X = sm.add_constant(X)

model = sm.OLS(Y, X).fit()

print(model.summary())
```

Figure 4.19: Python Code for Regression Analysis

```
                            OLS Regression Results
==============================================================================
Dep. Variable:     purchase_consideration   R-squared:                       0.362
Model:                                OLS   Adj. R-squared:                  0.326
Method:                     Least Squares   F-statistic:                     9.891
Date:                    Sat, 23 May 2026   Prob (F-statistic):           1.64e-07
Time:                            21:56:13   Log-Likelihood:                -117.04
No. Observations:                      93   AIC:                             246.1
Df Residuals:                          87   BIC:                             261.3
Df Model:                               5
Covariance Type:                nonrobust
==============================================================================
                             coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const                      0.8939      0.305      2.933      0.004       0.288       1.500
ai_human_like             -0.3003      0.142     -2.121      0.037      -0.582      -0.019
ai_understanding          -0.2040      0.140     -1.454      0.150      -0.483       0.075
smooth_conversation        0.2746      0.132      2.076      0.041       0.012       0.537
trust_ai_information       0.4613      0.084      5.461      0.000       0.293       0.629
ai_product_understanding   0.3082      0.138      2.239      0.028       0.035       0.582
==============================================================================
Omnibus:                        8.485   Durbin-Watson:                   2.092
Prob(Omnibus):                  0.014   Jarque-Bera (JB):                8.541
Skew:                           0.579   Prob(JB):                       0.0140
Kurtosis:                       3.929   Cond. No.                         26.8
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 4.20: Regression Output for Purchase Consideration

Interpretation

As we look at the regression analysis, the entire model shows significance at an R-squared of 0.362. This signifies 36.2% of customer purchase consideration variation can be accounted by these five AI-related independent variables within this regression. For the significance, the value below 0.05 confirms the regression model has the integrity to undergo analysis. As for the impact of each individual independent variables, 'trust_ai_information' presented a strong positive association to purchase consideration with the coefficient value of 0.461 and significant p-value (below 0.05). Customers who trust the AI voice agents' information will significantly increase the intention in purchasing products through them. The variable 'smooth_conversation' has positive significant impact on purchase consideration. Customers are willing to seriously contemplate in purchasing when interacting with an AI voice agent in smooth conversations. 'ai_product_understanding' also exerts a significant positive impact on customer's consideration for purchasing. Customer respond well and take AI voice agents in high regard when these agents effectively understand and articulate the information about the products. Conversely, 'ai_human_like' presented a statistically significant but negative coefficient in the regression analysis, which may mean customers found their interaction with a human-like AI to be more uncomfortable and thus less acceptable during sales process. Finally, 'ai_understanding' did not show a significant effect on customer's purchase consideration ($p>0.05$), as perhaps other factors such as the trusting relationship between the customer and the AI voice agents or smooth communication play more significant role in purchase consideration rather than the understanding capability itself. All in all, customer trust, AI voice agent conversation quality, and the understanding capabilities are key factors to a successful customer consideration stage in AI-enabled sales process. This suggests that the AI voice agents may play better during customer consideration phase rather than the concluding stage of a customer decision-making process.

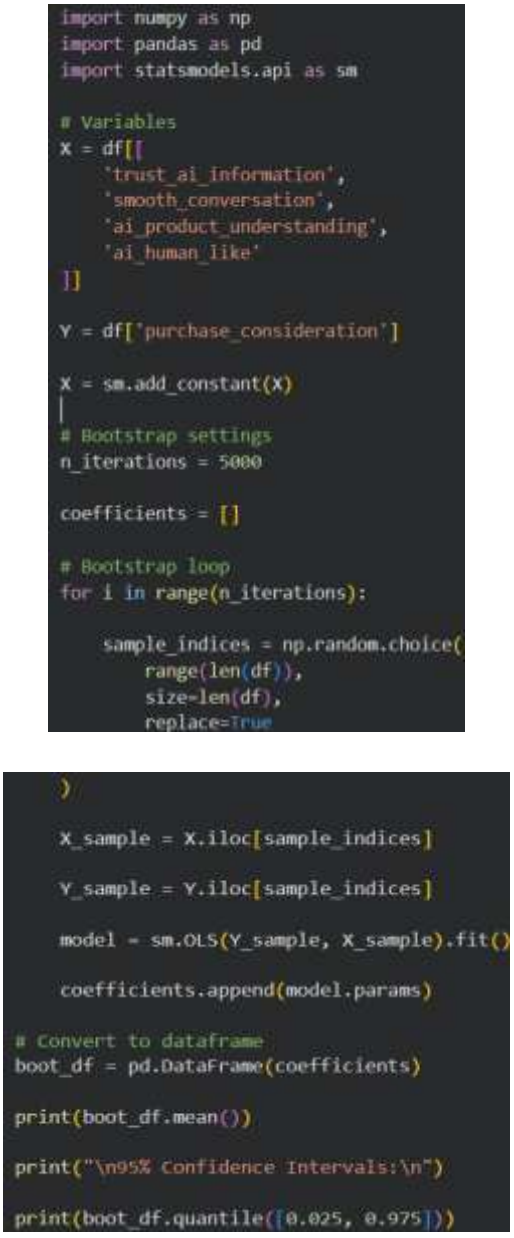
Variable	Coefficient Value	P-Value	Interpretation
AI Human-like Communication	-0.300	0.037	Significant Negative Impact
AI Understanding	-0.204	0.150	Not Significant
Smooth Conversation	0.275	0.041	Significant Positive Impact
Trust in AI Information	0.461	0.000	Strong Significant Positive Impact
AI Product Understanding	0.308	0.028	Significant Positive Impact

Table 4.3: Summary of Regression Analysis Results

The results of the regression analysis demonstrate that two key variables influence customers' purchase consideration during AI sales conversation, which are trust and the quality of the communication. In addition, this analysis is consistent with the previous argument that AI voice agents could contribute to sales at the earlier stages of the funnel.

4.2.9 Bootstrapped Regression Analysis

In addition, to obtain a more reliable and robust regression results, bootstrapped regression analysis was undertaken. Bootstrapping is one kind of complex and sophisticated resampling procedure for evaluating regression coefficients; through many time random sampling from a dataset, it reduces the sampling variability and estimates a more robust regression result. In this study, there were 5,000 bootstrapped samples obtained from random re-sampling with replacement in the study to check the regression coefficient of customer purchase consideration and variables on AI factors.



```
import numpy as np
import pandas as pd
import statsmodels.api as sm

# Variables
X = df[[
    'trust_ai_information',
    'smooth_conversation',
    'ai_product_understanding',
    'ai_human_like'
]]

Y = df['purchase_consideration']

X = sm.add_constant(X)

# Bootstrap settings
n_iterations = 5000

coefficients = []

# Bootstrap loop
for i in range(n_iterations):

    sample_indices = np.random.choice(
        range(len(df)),
        size=len(df),
        replace=True
    )

    X_sample = X.iloc[sample_indices]

    Y_sample = Y.iloc[sample_indices]

    model = sm.OLS(Y_sample, X_sample).fit()

    coefficients.append(model.params)

# Convert to dataframe
boot_df = pd.DataFrame(coefficients)

print(boot_df.mean())

print("\n95% Confidence Intervals:\n")

print(boot_df.quantile([0.025, 0.975]))
```

Figure 4.21: Python Code for Bootstrapped Regression Analysis

```
const                       0.844202
trust_ai_information        0.441129
smooth_conversation         0.241180
ai_product_understanding    0.225608
ai_human_like              -0.365333
dtype: float64

95% Confidence Intervals:

          const  trust_ai_information  smooth_conversation  \
0.025  0.466606              0.269079            -0.103142
0.975  1.289332              0.614083             0.548949

       ai_product_understanding  ai_human_like
0.025                 -0.028230      -0.708699
0.975                  0.454816       0.105057
```

Figure 4.22: Bootstrapped Regression Output and Confidence Intervals

Interpretation

The results of the bootstrapped regression analysis were consistent in terms of the coefficient values for the factors that affect customer purchase consideration. The customer trust_ai_information variable showed the largest coefficient in the set of selected variables. The trusting AI information is the most consistent driver for customer purchase consideration. The smooth_conversation variable has a positive coefficient as well, which suggests that the smoothness of conversation has positive impact on customer's purchase consideration. And ai_product_understanding also has positive coefficient which suggests that clear explanation for the product understanding also has positive effect on customer's purchase consideration. However, the ai_human_like has a negative coefficient which implies that overly human-like conversational style is not always appreciated by users. The 95% confidence intervals were used to demonstrate the reliability of the regression results through bootstrapping. The coefficients of each variable remain fairly stable, showing the statistical consistency of the regression results. The bootstrap regression results support original regression results as well.

Variable	**Bootstrapped Coefficient**	**Interpretation**
Trust in AI Information	0.441	Strong Positive Impact
Smooth Conversation	0.241	Positive Impact
AI Product Understanding	0.226	Positive Impact
AI Human-like Communication	-0.365	Negative Impact
Constant	0.844	Baseline Effect

Table 4.4: Bootstrapped Regression Coefficients

Variable	Lower Limit (2.5%)	Upper Limit (97.5%)
Trust in AI Information	0.269	0.614
Smooth Conversation	-0.103	0.549
AI Product Understanding	-0.028	0.455
AI Human-like Communication	-0.709	0.105
Constant	0.467	1.289

Table 4.5: 95% Confidence Intervals of Bootstrapped Regression

The bootstrapped results also add statistical backing to the regressions and bolster the credibility of the analysis performed.

4.2.10 Factor Analysis

In order to discover the dominant underlying dimensions that effect customer perception toward AI voice agent, factor analysis was conducted. This statistical method is applied to determine the group of related variables and common behavioral characteristics that the dataset exhibit. Using of Varimax rotation method can effectively improve the factors and interpretation.

```
# KMO+ Factor Analysis
fa = FactorAnalyzer(rotation='varimax')

fa.fit(df[likert_cols])

ev, v = fa.get_eigenvalues()

plt.scatter(range(1, len(ev)+1), ev)
plt.plot(range(1, len(ev)+1), ev)
plt.xlabel('Factors')
plt.ylabel('Eigenvalue')
plt.grid()
plt.show()
```

Figure 4.23: Python Code for Scree Plot and Factor Analysis

```
fa = FactorAnalyzer(n_factors=3, rotation='varimax')
fa.fit(df[likert_cols])

loadings = pd.DataFrame(
    fa.loadings_,
    index=likert_cols
)

print(loadings)
```

Figure 4.24: Factor Loading Matrix

	0	1	2
ai_human_like	0.898683	-0.064060	0.154843
ai_understanding	0.908659	-0.025962	-0.026454
smooth_conversation	0.871185	0.049278	0.099914
trust_ai_information	0.055618	0.653744	0.115407
purchase_consideration	0.123480	0.812743	-0.067484
prefer_human_agent	0.655892	0.123252	0.090284
ai_calls_irritating	0.194317	0.120708	0.971359
ai_product_understanding	0.879350	0.138598	0.055553
ai_purchase_influence	0.855505	0.096486	0.114249
comfort_final_purchase	-0.018959	0.506551	0.049394

Interpretation

The factor loading matrix indicates the correlation between variables and the extracted factors. The larger loading value signifies that the variables are strongly related to the factor.

The first factor displays high loadings for the variables ai_human_like, ai_understanding, smooth_conversation, ai_product_understanding, ai_purchase_influence. This factor largely encompasses the general communication quality and the functional capabilities of AI voice agents. The results seem to show that customers relate smooth communication, AI understanding, and human-like interaction heavily to the success of AI selling conversations.

The second factor shows high loading for variables like trust_ai_information, purchase_consideration, and comfort_final_purchase. This factor is conceptualized as a dimension of customer trust and confidence in the AI interactions that affects purchase decision making. The variables are highly clustered as these attributes of AI communication strongly influence customer purchase considerations.

The third factor represents the separate behavioral dimension for AI calls, it presents an exceptionally high loading for ai_call_sirritating. Customer irritation towards AI calls operates as a behavior distinct from all other positive AI communication factors.

The variable prefer_human_agent exhibits moderate loading scores on each factor, revealing that customer preference for human agents correlates partially with both communication quality and trust based dimensions. Overall, the factor analysis identified three major dimensions influencing customer perception toward AI voice agents:

1. AI Communication and Functional Effectiveness
2. Customer Trust and Purchase Confidence
3. Irritation and Resistance Toward AI Calls

From these results we can see that customer attitude toward AI voice agents are dominated by communication quality, trust, and emotional state during the calling. Additionally, these factor

analysis results further confirm the results of the previous regression and correlation by demonstrating a close relationship between trust-related and communication-related variables and customer purchase behavior.

4.2.11 Group Comparison Analysis

Analysis of comparing groups was implemented in order to identify whether the varying respondent groups have statistically significant different attitude toward the recognition and consideration of purchase for AI voice agents. Methods of Independent Sample T-Test and Chi-Square analysis were utilized in analyzing different respondent groups' behavior toward AI voice agent among occupation classification and customer identification behavior toward AI voice agents respectively.

Independent Sample T-Test

Objective of the Test

A group comparison analysis was conducted in order to test whether respondent groups had statistically different levels of awareness and buying consideration for AI voice agents. A customer analysis for comparing occupational groups and the customer recognition behaviors for AI voice agents was applied by employing statistical tools, which include Independent Sample T-Test and Chi-Square.

```
#GROUP COMPARISON
# T TEST
students = df[df['Occupation: ']==0]['purchase_consideration']
professionals = df[df['Occupation: ']==1]['purchase_consideration']

ttest_ind(students, professionals)
```

Figure 4.25: Python Code for Independent Sample T-Test

```
TtestResult(statistic=np.float64(0.034167972651823746), pvalue=np.float64(0.9728180408685703), df=np.float64(91.0))
```

Figure 4.26: T-Test Output

Interpretation

In Independent Sample T-Test, p-value calculated was 0.973 which is greater than the alpha level of 0.05. Hence, there is no statistically significant difference in purchase consideration of AI voice agents for students and working professional groups.

It reflects that both students and working professional have presented very similar attitudes toward sales interactions based on AI technology. The reason could be that none of the groups have showed significant differences in attitudes toward AI voice agents because it does not rely on occupation.

In the conclusion, the AI voice agents produce same amount of purchase consideration between these jobs included in the survey.

4.2.12 Chi-Square Analysis

Objective of the Test

The purpose of the Chi-Square analysis was to investigate if there is a difference in purchase consideration of the customer while dealing with sales calls when they are aware of the AI voice agent.

```
#Check association between:
#identified_ai
#purchase_consideration
table = pd.crosstab(
    df['identified_ai'],
    df['purchase_consideration']
)

chi2_contingency(table)
```

Figure 4.27: Python Code for Chi-Square Analysis

```
Chi2ContingencyResult(statistic=np.float64(22.101135983454483), pvalue=np.float64(0.004731918370247531), dof=8, expected_freq=array([[ 7.22580645,  9.03225806,  2.25806452,
1.58064516,  0.90322581],
       [ 3.78494624,  4.7311828 ,  1.1827957 ,  0.82795699,  0.47311828],
       [20.98924731, 26.23655914,  6.55913978,  4.59139785,  2.62365591]]))
```

Figure 4.28: Chi-Square Test Output

Interpretation

The p-value for Chi-Square was 0.0047 which is less than 0.05 (significance level). Therefore, there is a significant relationship between AI voice agent identification and purchase consideration.

These results suggest that customers' responses change after they have realized that they are interacting with an AI voice agent. When customers identify the AI participation, customers' perception towards the interaction may alter, hence leading to different levels of purchase consideration.

This finding implies the significance of customers' recognition and perception in AI mediated selling conversation. The result implies that transparency and customers' level of convenience dealing with

the AI are indeed important in affecting the customer's purchase consideration within a selling conversation.

Variables Compared	Test Used	P-Value	Result
Identified AI & Purchase Consideration	Chi-Square Test	0.0047	Significant Association Found

Table 4.6: Summary of Chi-Square Analysis

Occupation does not show a statistical difference for purchase consideration for AI voice agents in group comparison analysis, but customer perception to identify AI does have a significant impact on customer behavior.

4.2.12 Sales Funnel Analysis

We analyzed the sales funnel to understand the efficiency of AI voice agents in different customer decision phases. The purpose of this study was to know if the AI voice agents have the same effect in awareness, consideration and purchasing stage in the sales funnel.

In the analysis, variables that reflect communication quality, AI understanding, customer trust, influencing ability on purchase decision and customer final buying ease were grouped into different stages of customer purchase journey. We calculate the average value of each variable at each stage.

```
# SALES FUNNEL STAGE SCORES

funnel_scores = {

    'Awareness_Interest': df[[
        'ai_human_like',
        'ai_understanding',
        'smooth_conversation'
    ]].mean().mean(),

    'Consideration': df[[
        'trust_ai_information',
        'ai_product_understanding',
        'purchase_consideration',
        'ai_purchase_influence'
    ]].mean().mean(),

    'Final_Purchase': df[[
        'comfort_final_purchase'
    ]].mean().mean()

}
```

Figure 4.29: Python Code for Sales Funnel Stage Score Calculation

```
{'Awareness_Interest': np.float64(3.6021505376344085),
 'Consideration': np.float64(2.779569892473118),
 'Final_Purchase': np.float64(1.8172043010752688)}
```

Figure 4.30: Sales Funnel Stage Scores

```
import matplotlib.pyplot as plt

stages = list(funnel_scores.keys())

scores = list(funnel_scores.values())

plt.figure(figsize=(10,6))

plt.bar(stages, scores)

plt.title(
    "AI Effectiveness Across Sales Funnel Stages",
    fontsize=16,
    fontweight='bold'
)

plt.xlabel("Sales Funnel Stages")

plt.ylabel("Average Effectiveness Score")

plt.ylim(0,5)

plt.show()
```

Figure 4.31: Python Code for Sales Funnel Visualization

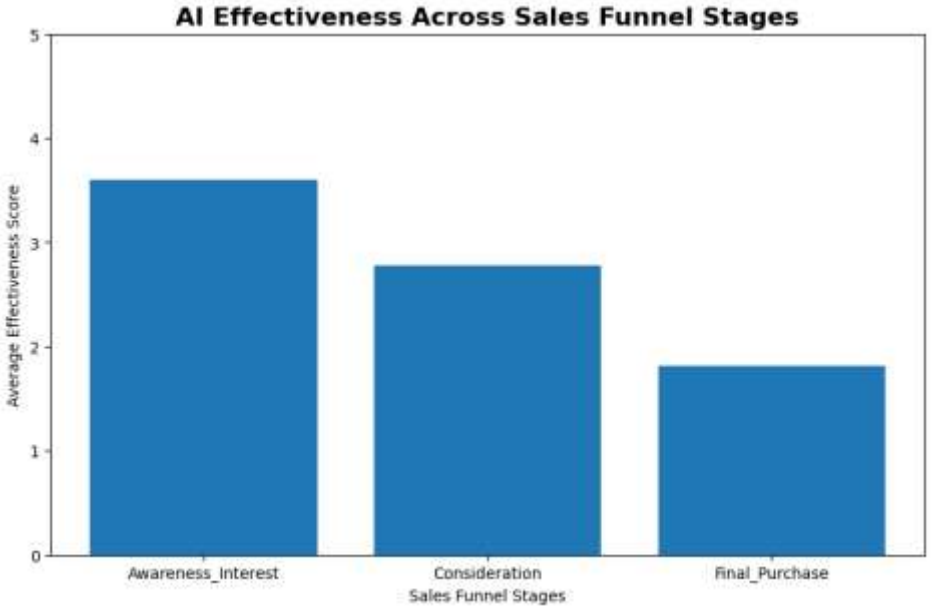


Figure 4.32: AI Effectiveness Across Sales Funnel Stages

Interpretation

AI voice agent effectiveness analysis throughout sales funnels indicates a varying performance in different stages of the decision making process. A higher effectiveness score was reported in Awareness and Interest stages with a mean score of 3.60. This illustrates AI voice agent as performing better in grabbing the customers attention and interest along with delivering elementary product information communication.

The performance in Consideration stage was recorded at a moderately effective score of 2.78. It implies AI agents are fairly successful in assisting the customers in product evaluation and purchase consideration where factors like trust in AI information, knowledge of the product, and purchase intent played positive contribution. But still at a lower stage than awareness stage.

Lowest performance was obtained at the Final Purchase stage with effectiveness score of 1.81, customer do not wish to completely rely on the AI voice agents for the final purchase stage, though AI agents can perform well and stimulate the interest and consideration they are less accepted in final stage. This depicts an insight, organizations may be relying more on AI for information and engagement but need a human for the final purchase decision.

The decreasing effectiveness across the stages shows an important business insight from the research; AI voice agents is performing better in earlier to middle stages of the sales funnels where information and engagement are the crucial components but is less successful as and when the final purchase stage approaches where customers gain more confidence and prefer to deal with human.

Henceforth, we can conclude that AI voice agent may serve as the tools of engagement, product information, purchase consideration, but at the final stage organizations may still depend on human support.

Sales Funnel Stage	**Average Effectiveness Score**	**Interpretation**
Awareness & Interest	3.60	High Effectiveness
Consideration	2.78	Moderate Effectiveness
Final Purchase	1.81	Low Effectiveness

Table 4.7: AI Effectiveness Across Sales Funnel Stages

The findings from the sales funnel analysis strongly support the overall research objective by identifying the stages where AI voice agents are most and least effective during customer sales interactions. [1][6][11]

4.2.13 Regression Analysis for Final Purchase Comfort

Objective of the Model

The regression model intended to investigate whether trust in AI info, human agent preference, and AI purchase influence has an impact on customers' comfort level during final purchase. The purpose of investigating this is to study if the customers are completely comfortable with trusting AI voice agents while making the final purchase or they still would prefer human agents to help them.

```
X = df[[
    'trust_ai_information',
    'prefer_human_agent',
    'ai_purchase_influence'
]]

Y = df['comfort_final_purchase']

X = sm.add_constant(X)

model = sm.OLS(Y, X).fit()

print(model.summary())
```

Figure 4.33: Python Code for Regression Analysis of Final Purchase Comfort

```
                            OLS Regression Results
==============================================================================
Dep. Variable:     comfort_final_purchase   R-squared:                       0.130
Model:                                OLS   Adj. R-squared:                  0.101
Method:                     Least Squares   F-statistic:                     4.437
Date:                    Sun, 24 May 2026   Prob (F-statistic):            0.00593
Time:                            04:55:57   Log-Likelihood:                -128.81
No. Observations:                      93   AIC:                             265.6
Df Residuals:                          89   BIC:                             275.7
Df Model:                               3
Covariance Type:                nonrobust
==============================================================================
                             coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const                      1.1265      0.367      3.069      0.003       0.397       1.856
trust_ai_information       0.3002      0.093      3.245      0.002       0.116       0.484
prefer_human_agent         0.1318      0.098      1.344      0.183      -0.063       0.327
ai_purchase_influence     -0.1044      0.097     -1.082      0.282      -0.296       0.087
==============================================================================
Omnibus:                       26.012   Durbin-Watson:                   1.774
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               39.722
Skew:                           1.229   Prob(JB):                     2.37e-09
Kurtosis:                       5.052   Cond. No.                         21.6
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 4.34: Regression Output for Final Purchase Comfort

Interpretation

The regression analysis indicated an R-squared value of 0.130 which shows that only around 13% of the variance of customer comfort in final stage of purchase can be attributed to selected factors which

were added to regression model. Even though model explanatory power is moderate the model as whole was significant, as p-value of the model is <0.05. Among the independent variables, the factors of trustaiinformation has significant impact on customer comfort at final purchase decision with positive relationship. This shows that, the trust of the customer in AI-given information plays significant role in building the customer's comfort and confidence in buying process. Other factors trust, preferhumanagent and aipurchaseinfluence were not statistically significant as their p-values are >0.05, these factors show that the customer while trusting the voice agent and considering buying influenced by AI voice agent will not necessarily feel completely comfortable in relying on AI agent when making the purchase commitment in the end. This implies that even though customers may trust the voice agent, still customers need certain level of assurance before making purchase decision for major items. In the end, AI voice agents might be performing well in initial phases of sales process and it appears the need of human agent at the last stage of purchase is still very significant.

Variable	**Coefficient Value**	**P-Value**	**Interpretation**
Trust in AI Information	0.300	0.002	Significant Positive Impact
Preference for Human Agent	0.132	0.183	Not Significant
AI Purchase Influence	-0.104	0.282	Not Significant

Table 4.8: Summary of Regression Results for Final Purchase Comfort

4.2.14 Human Dependency Gap Analysis

For the purpose of assessing further the dependence of customers to human support during their decision-making for the final purchase a comparison between the customer purchase consideration score and the final purchase comfort score was carried out. The calculation of a human dependency gap was carried out by measuring the difference between the variables.

```python
df['human_dependency_gap'] = (
    df['purchase_consideration'] -
    df['comfort_final_purchase']
)

df['human_dependency_gap'].mean()

np.float64(0.22580645161290322)

comparison = df[[
    'purchase_consideration',
    'comfort_final_purchase'
]].mean()

comparison.plot(
    kind='bar'
)

plt.title(
    "AI Influence vs Final Purchase Comfort"
)

plt.ylabel("Average Score")

plt.show()
```

Figure 4.35: Python Code for Human Dependency Gap Analysis

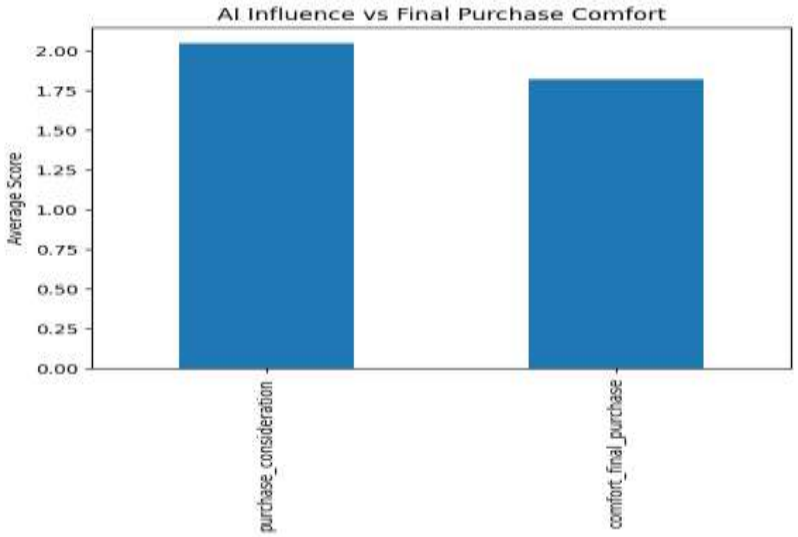


Figure 4.36: AI Influence vs Final Purchase Comfort Graph

Interpretation

The final human dependency gap score was 0.226. The bar chart comparison demonstrates that the mean score of the consideration stage was greater than the mean score of the final purchase comfort stage. This indicates that while AI voice agents may facilitate initial consideration and exploration of products and services, customers are not as comfortable when purchasing final goods or services without human assistance.

Essentially, AI systems are adept at creating awareness and gaining consideration from consumers but still exhibit a level of uncertainty during the final purchase without human interaction. The

difference in the consideration stage versus final purchase comfort stage reveals the persistent need for human intervention in highly confident purchases, as customers require the extra assurances, emotional comfort and direct explanation needed to finalize the transaction.

The human dependency gap is aligned with the other findings in this study that indicate the success of AI voice agents in raising awareness and driving consideration but also reveals the role of humans at the final conversion stage of the sales funnel..

4.2.15 Quadratic Regression Analysis of Uncanny Valley effect

There is an unusual result from the above study's regression analysis, with aihumanlike having a negative impact on the customer purchase consideration, which is contrary to the hypothesis that an AI voice agents with the human-like quality will benefit customer purchasing. Based on previous research, anthropomorphic AI enhances the customer's level of trust, involvement and quality of interactions, therefore the inconsistent findings need to be analyzed further. With that reason, a further quadratic regression analysis was performed in Python by utilizing the Google Colab platform to explore whether the relationship between AI human-likeness and customer purchase consideration fits the Uncanny Valley trend that mentioned in the literature review section.

Based on the Uncanny Valley theory, with an increasing degree of anthropomorphism, the customer will feel a high level of comfort, trustworthiness, emotional engagement, and involvement, whereas with the high degree of human-like quality, the customer may experience a high level of creepiness or uncertainty when interacting with an AI system which makes the feeling unpleasant. Consequently, as the uncanny valley progresses, customers might have a negative perception toward the highly human-like artificial intelligent voice agent.

In order to test the relationship, a quadratic term was introduced into the analysis of the variable aihumanlike by squaring the latter. The below equation was used to perform the regression analysis:

$$Purchase\ Consideration = \beta_0 + \beta_1(AI\ Human\ Likeness) + \beta_2(AI\ Human\ Likeness)^2$$

With the regression on customer purchase consideration, the linear and quadratic coefficient of AI human-likeness were positive (= 0.6543) and negative (= -0.1054), respectively. This means a moderate level of human-likeness in AI voice agents could lead to an increase in customers' purchase consideration, but as human-likeness increases above certain extent, the customers' purchase consideration could decrease, which means the quadratic coefficient was in accordance with Uncanny Valley theory. Although quadratic coefficient was not significant at the 5% level (p = 0.138), the positive linear and negative quadratic coefficients showed that there was an incipient nonlinear relationship between AI human-likeness and customer purchase consideration.

```python
# Independent variables
X = df[['ai_human_like', 'ai_human_like_sq']]
X = sm.add_constant(X)

# Dependent variable
y = df['purchase_consideration']

# Regression model
model = sm.OLS(y, X).fit()

# Results
print(model.summary())
```

Figure 4.37: Regression model setup for hypothesis testing.

```
                            OLS Regression Results
==============================================================================
Dep. Variable:     purchase_consideration   R-squared:                       0.026
Model:                                OLS   Adj. R-squared:                  0.005
Method:                     Least Squares   F-statistic:                     1.210
Date:                    Mon, 25 May 2026   Prob (F-statistic):              0.303
Time:                            19:11:45   Log-Likelihood:                -138.19
No. Observations:                      94   AIC:                             282.4
Df Residuals:                          91   BIC:                             290.0
Df Model:                               2
Covariance Type:                nonrobust
==============================================================================
                     coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const              1.2510      0.538      2.326      0.022       0.183       2.319
ai_human_like      0.6543      0.422      1.550      0.125      -0.184       1.493
ai_human_like_sq  -0.1054      0.070     -1.498      0.138      -0.245       0.034
==============================================================================
Omnibus:                       20.179   Durbin-Watson:                   1.718
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               24.858
Skew:                           1.190   Prob(JB):                     4.00e-06
Kurtosis:                       3.829   Cond. No.                         108.
==============================================================================
```

Figure 4.38: OLS regression results for purchase consideration.

This graphical representation of polynomial regression illustrated an inverted U-shaped association (at a lower level of magnitude) between human-like AI and consideration of purchase. In this, the graph suggests that while the consideration of purchase was at its peak at medium level of human-likeness, it declined at higher level of anthropomorphism. This can support the theoretical premise that consumers may feel discomfort psychologically when AI becomes extremely human-like.

```
plt.figure(figsize=(8,5))

sns.regplot(
    x='ai_human_like',
    y='purchase_consideration',
    data=df,
    order=2,
    scatter_kws={'alpha':0.7}
)

plt.title("Uncanny Valley Effect")
plt.xlabel("AI Human-Likeness")
plt.ylabel("Purchase Consideration")

plt.show()
```

Figure 4.39: Code for visualizing the Uncanny Valley effect.

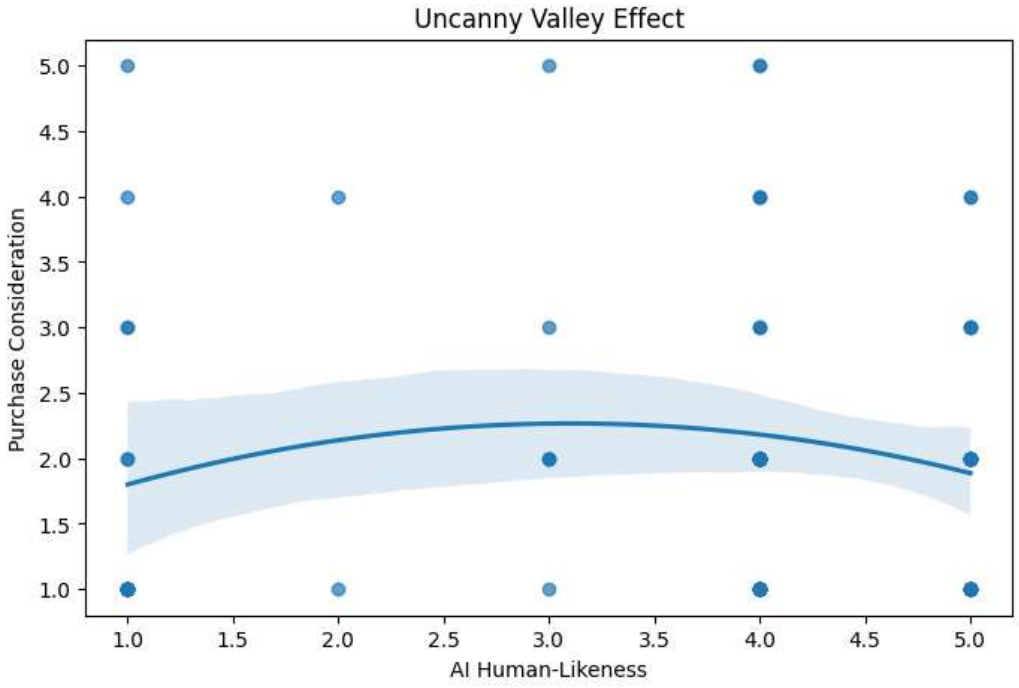


Figure 4.40: Regression plot showing the Uncanny Valley effect.

In summary, this study's results demonstrate that mild humanization is beneficial for both customer engagement and purchase intention, but human mimicry may make customers feel uncomfortable, weird, and suspicious. It indicates that businesses should create an anthropomorphic AI voice system, but it should not make the voice sound too human like. The result offers limited empirical support to the Uncanny Valley theory in the context of AI voice and purchase behavior and also constitutes an important theoretical contribution of the present study.

4.3. Findings and Recommendations

This chapter presents the major findings obtained from the statistical analysis conducted in the study titled “Impact of AI Voice Agents on Customer Perception and Purchase Decisions.” The findings are based on demographic analysis, reliability testing, correlation analysis, hypothesis testing, regression

analysis, factor analysis, group comparison analysis, sales funnel analysis, and human dependency analysis conducted using Python statistical tools.

The objective of this chapter is to summarize the important outcomes of the study and provide practical recommendations for organizations using AI voice agents in sales and customer communication processes.

4.3.1Key Findings of the Study

1-Findings from Demographics analysis:

Demographics analysis shows that most respondents fall within the 21-25 and 26-30 years age groups which means younger users are more involved in AI-driven communication systems and online selling environment. The reasons are they have higher levels of digital literacy, are used to operating various AI-driven technologies on daily basis, and tend to be more open and receptive toward interacting with automated voice assistants.

From occupational analysis shows that most respondents are students and the rest are professionals. This may suggest that most of the data collected is from digitally inclined customers who constantly use online-based platforms and are very likely to encounter automated systems and/or have a lot of contact with automated voice agents.

Demographics indicates that currently the AI voice agents have better visibility and contact with younger and digitally active customer groups.

2- Findings from Reliability Analysis:

Reliability analysis with Cronbach's Alpha is equal to 0.853, indicating high internal consistency among the variables of the questionnaire. Since the score is above the minimum 0.70 acceptable value for reliability, the questionnaire is statistically reliable for data analysis.

The high Cronbach's Alpha score confirms that the variable related to communication quality of AI voice agent, trust level of customer to the AI, purchase consideration of the customer toward the product, influence of AI and customer comfort during purchasing decision is coherently measuring the same construct (customer perceptions towards AI voice agent).

3- Findings from Correlation Analysis:

Some main conclusions were observed from the relations between the AI-related variables and customer purchase behavior. Human-like communication showed a high positive correlation with smooth conversation, implying that customer wants to interact with AI which is more human-like and comprehensible. AI understanding had a high positive relation with AI product understanding, which

can mean that customers rely on AI which knows about the products better and understand customer's intention properly.

Furthermore, AI purchase influence had a high positive correlation with human-like communication. It seems that AI voice agent can more easily persuade customer purchase decision when they talk in more human-like style. In general, it can be implied that customers feel more satisfied during the interaction with AI voice agent if the experience is smooth, human-like, and personal.The relationship between the trust of the customer in AI information and purchase consideration is moderate positive which indicates that the trust on AI plays an important part on the final decision for purchasing.

It was also found that the customer comfort on the final purchasing stage shows only weak relations with many variables. This means that although AI voice agents can help to build the customer attention and consideration toward the product, it might be still difficult for customer to be 100% dependent on AI on final purchasing stage.

4- Findings from Hypothesis Testing:

Eight hypotheses were tested using Pearson Correlation analysis to see the influence of AI voice agent toward customer behavior and purchase intention toward products. There were three hypotheses accepted which indicate that customer trust toward AI information has positive relation to purchase consideration, human-like communication and AI purchase behavior as well as AI product understanding influence the customer purchase consideration. All three hypotheses were statistically significant and accepted.

Some hypothesis are rejected as there were no statistical significance, these include that Smooth conversation can not directly leads to customer trust, customer comfort level towards the final purchase stage does not really affected by AI influence on their purchase decision, while AI understanding capability has weaker influence on customer trust and human interaction remains essential during the purchase of certain goods at final stage.

5- Findings from Regression analysis:

From the regression analysis of purchase consideration, trust in AI information was shown to have the highest positive influence. AI smooth conversation and AI product understanding were also found to have positive relations. The regression model accounted for 36.2% of the variance in customer purchase consideration which clearly explains that the communication quality and customer trust were major variables affecting AI influenced purchase decision. It was also noticed that human-like communication toward AI voice agent was found with a negative coefficient value in regression analysis, which indicates that a high level of imitation on human voice agent does not necessarily make customers feel comfortable.

6- Findings from Bootstrapped Regression analysis:

Bootstrapped regression analysis confirmed the robustness of previous results that the most dominant relationship found between trust and customer purchase consideration remains to be a stable positive relation. Smoother conversation and AI product understanding both continue to show a positive relationship with customer purchase intention and purchase behavior.

The confidence intervals produced during the bootstrapping process are relatively stable for all variables which indicated that the coefficients are indeed statistically reliable.

7- Findings from Factor analysis:

From the factor analysis, 3 factors have been extracted which influencing customer perception toward AI voice agents. Factor 1 is AI Communication and Functional Effectiveness (AI human-like communication, AI understanding, smooth conversation, AI product understanding, AI purchase influence) that indicates that customer considers AI as more effective when communication quality and functional effectiveness of AI are better. Factor 2 is Customer Trust and Purchase Confidence (Trust in AI information, Purchase consideration, Comfort during final purchase) that shows that customer trust directly correlates with their purchasing confidence. Factor 3 is Irritation and Resistance toward AI Calls (This factor only includes negative element about annoyance of the sales calls).

Factor analysis demonstrates that customer perception of AI voice agent relies heavily on their trust level in AI, the communication quality they experience and also how they perceive about themselves while communicating with an AI voice agent.

8- Findings from Group Comparison Analysis:

According to the Independent Sample T-Test conducted, there was no significant difference between students and working professionals on purchase consideration towards AI voice agent. Thus, occupational background can't significantly contribute to the perception towards AI voice agent. On the other hand, the Chi-Square test shows that there was a significant relationship between identifying the AI and purchase consideration which indicated that customer behavior would change once the customer knows that they were communicating with an AI agent.

9- Findings from Sales funnel analysis:

The result of the sales funnel analysis found one of the most important result in the study. The AI voice agent worked really well during the Awareness and Interest stage, whereas showed a moderate success on Consideration stage and low effectiveness on the final purchase stage. Average effectiveness score from the three stages were 3.60 for Awareness and Interest, 2.78 for Consideration and 1.81 for the final purchase. From the result, AI voice agent was successful in drawing customer

attention and knowledge towards product, but is not yet able to provide sufficient support for the customer during their decision making to purchase. Therefore AI voice agents are more effective for early and mid sales funnel stages compared to the late purchase decision stage.

10- Findings from Final purchase regression and Human dependency analysis:

The final purchase regression shows that the trust level on the AI information has a significant positive impact toward the final purchase comfort, but the influence of Human Agents preference and AI purchase influence shows no statistical significance toward the customer comfort level on the final purchase. From the human dependency gap analysis, the customer purchase consideration scores (0.265) is greater than the final purchase comfort scores (0.226) so it has a positive mean of 0.039.

4.4 Recommendations

Based on the findings of the study, the following recommendations are suggested for organizations using AI voice agents in sales and customer communication systems. [1][6][11] [2][3][28]

4.4.1 Building Customer Trust.

The study has shown that trusting the AI's information is one of the highest impacting variables for customer purchase consideration and comfort. It is important for organizations to prioritize reliability, transparency, and accuracy of AI's generated information, ensuring that the information provided by AI is correct, the recommendations it makes are clear, the conversation itself is clear and that customers can rely on the AI agent for effective assistance. Building customer trust will result in higher levels of customer engagement, customer satisfaction, and purchase consideration. Organizations should routinely check, update and maintain AI systems to uphold consistency and quality. [4][11][12][3][17][18][6][13][17]

4.42. Quality of communication from AI voice agents.

It has been found that smooth conversation and human-like interaction positively influence customers' behavior and communication. Thus organizations must focus on conversational flow, quality of voice, NLP capabilities and relevance to customers, by ensuring that AI systems communicate naturally, clearly and effectively without sounding too robotic. These characteristics contribute to increased levels of customer satisfaction, trust and will influence purchasing decisions. [8][14][15][26][45]

4.5.3 Avoid Excessive human-like imitation.

It has been shown in the regression analysis that an AI that too excessively imitates human characteristics may result in an undesirable influence on customers' perception and comfort level. This is because customers do not find it comfortable to communicate with AI agents when it too clearly attempts to impersonate humans. Therefore organizations must use a tone that is neither too

artificial, nor too human. Customers prefer honesty and authenticity rather than the idea that the AI agent is fully human. [8][14][15]

4.5.4 Utilize AI voice agents in the early sales funnel.

The sales funnel analysis revealed that AI voice agents have a higher impact at the consideration and awareness stage of the sales funnel. This can be utilized to implement AI for communication with customers about products/ services, gathering customer information (leads), responding to FAQs, or for marketing. AI agents can perform routine communicative tasks with greater efficiency, thus alleviating the workload of sales employees, and extending the reach to the customer. [1][6][11][26][45]

4.5.5 Human agents for final purchasing phase.

Customers are more likely to need a degree of reassurance from human agents during the final stage of purchase. Therefore, a blend of AI and human interaction seems to be optimal in the sales funnel: AI should handle initial interaction with the customer during the first stage of the sales funnel, whereas human agents should handle the final stage. [3][17][18]

4.5.6 Reduced irritation from AI calls.

Although irritation was found to have a low statistical value in the study, negative communication may still result in negative customer perceptions over the long run. Therefore, the most obvious solution is to reduce unnecessary communication or interaction that would cause frustration (such as redundant answers, interruptions, robotic tones or late answers). [26][45]

4.6.7 Personalized and contextualized AI communication.

Customers respond to information that is tailored to them; that shows the organization has considered individual needs, wishes, product concerns and interests. In this way organizations should endeavor to integrate systems that enable personalization and adapt communication and suggestions to the customer. [26][45][3][17][18][18][36]

4.7.8 Transparency and Ethical AI Usage.

In order to maintain customer trust, they should be clearly informed they are talking to an AI, rather than an human agent. Such transparency can improve comfort level and avoid any suspicion of manipulation. Also important is to protect the customer's personal data and ensure secure and ethical AI usage, in order to foster an environment of trust. [22][29][26][45]

4.5 Limitation of the Study

There are a number of limits to every study and these limitations may impact upon the scope and interpretations of a study as well as their generalizability. The present study entitled 'Impact of AI Voice Agents on Customer Perception and Purchase Decision' also has a number of limitations that must be taken into account in an understanding of the results and conclusions of the study. While the present study offers a valuable perspective on the function of AI voice agents in today's business communications and purchasing decisions, a number of practical and methodological limitations were encountered during the research:

4.5.1 Small Sample Size

The study was conducted with the responses of only 94 people, and while the responses were useful for the purposes of the study, a larger sample size would undoubtedly have led to more reliable and generalizable results about the perceptions and purchasing habits of consumers toward AI voice agents and provided increased statistical reliability. A larger sample would also have better represented the varied categories of customers.

4.5.2 Convenient Sampling Method

The sample was drawn primarily using convenient sampling and since the questionnaire was administered electronically through the use of online tools, social media, and through personal contacts, it is possible that it did not accurately reflect the full range of consumers who might use AI voice agents. As the survey was mostly filled out by students and a highly digital user base there may have been a certain amount of sampling bias in this study.

4.5.3 Time Constraint

The study was limited in time, and there was not enough time to study the customer behavior over a longer time frame or their changing perceptions to the technology over that time frame, customer perceptions of AI systems could change, customer purchase behavior and customer loyalty also may not be stable and can fluctuate with changes over time.

4.5.4 Response Bias

This study relied on a structured questionnaire and therefore respondents are subject to answering according to their own personal opinions, assumptions, perceptions, and experiences, which can cause response bias. Also respondents might have been limited in terms of how they had used AI voice agents.

4.5.5 Limited Geographic Reach

The present study was mostly conducted with a particular set of customers from one geographic area and demographic. It is possible that perceptions might differ significantly from one region of the world to another based on cultural beliefs, values, and standards. It may also differ based on region, or economy of the country that is being evaluated.

4.5.6 Technology Rapid Change

Due to the speed that technology progresses and develops and new technologies such as improved artificial intelligence and natural language processing systems, it is likely that consumer preferences will be influenced in the future with further developments in technology, thus possibly rendering results of this study null at some point.

4.5.7 Industry Differenced Not Addressed

The various applications of AI voice agents in the various industries such as banking, health care, retail, telecommunications, hospitality and e-commerce may differ; hence there could be differing opinions in relation to its use in each sector. However this was not something that was studied at length within this research.

4.5.8 Psychological and Emotional Influences

Customer psychology such as customer emotions, customer trust levels, customer satisfaction and customer purchase intent are often difficult to measure accurately using traditional survey methods due to them being such subjective components of decision-making processes. This could have contributed to bias in the collected data.

4.5.9 Lack of Investigation into Technical aspects of AI voice agents

This research study focused on the customer perception and purchase intention in relation to AI voice agents and did not look into details of AI voice agent software such as the AI accuracy of the technology, or system quality in terms of speech recognition capability or responsiveness, to mention a few technical characteristics that could affect customer perception and purchase behavior.

4.5.10 Limited Study into long term usage

The current research study was designed to reflect present customer feelings and use of AI voice agents, however, the nature of future customer behavior and loyalty toward AI voice agents could not be accurately determined.

Despite the limitations outlined, the findings of this research study demonstrate a valuable overview into the functionality of AI voice agents and the impact that they are starting to have on consumer behavior and interactions. It can assist the business world in better understanding AI and its impact.

CHAPTER 5. CONCLUSION

This current study titled "Impact of AI voice agents on customer perception and purchase consideration" was conducted with the aim of identifying the impact of AI voice communication system on customer behavior, customer trust, customer purchase consideration and sales efficiency at various stages of customer decision-making process and determining whether AI voice agent could foster customer interaction and buying behavior. [4][11][12] [3][17][18] [1][6][11] [6][13][17]

With the widespread advancement of Artificial Intelligence in communication and customer service processes of businesses across different sectors like banking, telecommunication, retail, e-commerce and so on, AI voice agent is becoming increasingly pervasive in all sectors of business including communication and customer support. Organizations across the various sectors of businesses are continually incorporating AI-based communication technology, to maximize business efficiency, enhance customer satisfaction, accelerate response time, automate business communications and personalize customer interactions. Therefore, the purpose of the present research was to assess both strengths and limitations of AI voice agents from the perspective of customers. [1][6][11]

This research adopted both secondary and primary research methods in collecting data for study. Primary data was collected from questionnaire which was personally administered to respondents across various demographics and professional backgrounds. The data was gathered and collated by accessing academic journals, reports, articles, books and previous researches that dealt with AI communication systems and customer behavior in form of secondary data. Finally, all collected data were analyzed using different techniques of statistical analysis, including correlation, hypothesis testing, regression analysis, bootstrapping, reliability testing, factor analysis, group analysis and sales funnel analysis by using Python.

This study provided interesting finding related to customers perception toward AI voice agent. Demography analysis showed that younger age groups and individuals who are more active in digital media are more exposed to AI voice communications. The reliability analysis indicated that the used questionnaire was statistically reliable and internally consistent for performing advanced statistical analyses. [1][6][11]

Correlation analysis proved that quality of communication, human-like interaction, ability of AI to understand, and customer trust are positively related to customers purchase consideration, i.e., customers gave positive feedback about smooth conversations, proper understanding of products, and natural interactions provided by AI systems. Customer trust in information generated by the AI system was the key factor for customer purchase consideration. [4][11][12] [3][17][18] [8][14][15] [26][45]

The results of the hypothesis testing provided evidence for positive impact of customer trust, human-like interaction and AI ability of understanding on customer purchase decision, and on the contrary it

also confirmed that at final purchase stage AI has limitations in influencing customer behavior when it comes to customers confidence and emotional assurances. [4][11][12] [3][17][18] [8][14][15] [26][45]

The regression analysis revealed that there was a positive relationship between customer purchase consideration and AI communication quality, AI ability of understanding and customer trust on AI generated information. AI information trust was the strongest factor which affected customer purchase behavior followed by smooth communication and AI product understanding. The overly human-like communication was observed with negative relationship as per the regression model, meaning that human-like conversation might make customers uncomfortable. [4][11][12] [3][17][18] [8][14][15] [26][45]

Bootstrap regression test confirmed the stability of the result over time and sample. Factor analysis showed three factors influencing customer perception of AI voice agent [1][6][11]

1. Communication and functional efficiency of AI.
2. Customers trust and purchase confidence.
3. Irritation and resistance toward AI calls.

The finding on the Sales Funnel Analysis was very interesting and highlighted that AI voice agents have a very high effectiveness at the awareness stage, a reasonable effectiveness at interest and consideration stage and the least effectiveness at the purchase stage of the customers' buying journey [3][17][18] [1][6][11] [26][45].

Further the finding of human dependency gap analysis confirms that customers purchase consideration was higher than customer purchase comfort, implying that while customers accept to engage with AI systems but human reassurance at the final stage of purchasing is required for higher level of comfort and emotional confidence. [3][17][18] [26][45]

Thus, it can be concluded that while AI voice agents contribute positively towards customer interaction and sales efficiency they cannot wholly replace human communication throughout all stages of the customers' buying decision-making process. [1][6][11] [6][13][17] [26][45]

Thus, integration of AI voice agents and human agents together will provide the best experience for the customer and increase business efficiency through a hybrid communication process where AI deals with routine and factual issues and human agent handles complex emotional and decision making issues. [1][6][11]

It can be further concluded that while implementing AI voice agents, organization must concentrate on building customer trust, quality of AI communication, clarity and transparency in the communication and also ethical use of AI technologies. [4][11][12] [22][29]

Finally, this research helps in both academic understanding and business applications, while explaining the impact of AI voice agents on customer communication and providing effective guidelines for implementation of AI-based communication technology. This research also provided a good opportunity for future researches related to personalization and emotional capability of AI system, and customer trust in the long run. [4][11][12] [1][6][11] [26][45]

It can be concluded that AI voice agents are very important in future but cannot wholly replace human interaction while taking final purchasing decisions. The sales communication is an amalgamation of AI and humans. [3][17][18] [1][6][11]

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ANNEXURE

1.Questionnaire

Title: *Impact of AI Voice Agents on Customer Perception and Purchase Decision*

Purpose:
This survey aims to understand how AI voice agents influence customer perception and buying decisions. [3][17][18] [1][6][11]

Section 1: Basic Information

- Email Address

Section 2: Demographic Details

- Age:
    - 15–20
    - 21–25
    - 26–30
    - 31+
- Occupation:
    - Student
    - Working Professional
    - Other
- Have you received a sales/marketing call that you believe was from an AI voice agent?
    - Yes
    - No
    - Not Sure
- Were you able to identify that it was AI?
    - Yes
    - No

- Not Sure

Section 3: Experience with AI Voice Agent

(Rate on a scale of 1 to 5)

- The AI agent sounded natural and human-like

  1= Strongly Disagree 5 = Strongly Agree

- The AI was able to understand and respond to your queries properly

  1= Strongly Disagree 5 = Strongly Agree

- The conversation felt smooth (not robotic or scripted)

  1= Strongly Disagree 5 = Strongly Agree

- AI helped me understand the product better

  1= Strongly Disagree 5 = Strongly Agree

- AI influenced my decision to consider buying

  1= Strongly Disagree 5 = Strongly Agree

- I feel comfortable making a final purchase through AI

  1= Strongly Disagree 5 = Strongly Agree

Section 4: Trust and Decision Making

(Rate on a scale of 1 to 5)

1= Strongly Disagree 5 = Strongly Agree

- I trust the information provided by AI

  1= Strongly Disagree 5 = Strongly Agree

- I am concerned about my data being recorded by AI

  1= Strongly Disagree 5 = Strongly Agree

- I would consider purchasing a product recommended by AI calls

  1= Strongly Disagree 5 = Strongly Agree

- I would prefer a human agent before making the final decision

  1= Strongly Disagree 5 = Strongly Agree

Section 5: Negative Perception and Issues

(Rate on a scale of 1 to 5)

- I find AI sales calls irritating or intrusive

  1= Strongly Disagree 5 = Strongly Agree

What bothered you the most?

- Repetitive/scripted responses
- Lack of human understanding
- Too many calls (spam)
- Trust issues
- Nothing

Section 6: Open-Ended Insight

- What is the main reason you would NOT buy from an AI sales call**?**

2. Python Codes

- https://colab.research.google.com/drive/1itdNrK1S3NXiKPQJO3zhm2YIm5Efh5e#scrollTo=31Xdy7aaV8Fl
- https://colab.research.google.com/drive/1djqEFr193qJ6dp_3MoC69fp2gMR37kdk#scrollTo=Zb95qumPT92X
- https://colab.research.google.com/drive/13khmAsw1NO21uQcV-BPX0Y2pfkuI38e6#scrollTo=lTWq6azajNn8