

THE CRUCIAL ROLE OF CONTACT CENTERS IN ENHANCING CUSTOMER
EXPERIENCE AND THE ETHICAL CONSIDERATIONS ASSOCIATED WITH THE
ADOPTION OF VOICE ANALYSIS TECHNOLOGY

by

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DISSERTATION

Presented to the Swiss School of Business and Management Geneva

In Partial Fulfillment

Of the Requirements

For the Degree

DOCTOR OF BUSINESS ADMINISTRATION

SWISS SCHOOL OF BUSINESS AND MANAGEMENT GENEVA

January, 2025

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Dedication

This thesis is dedicated to my loved ones and close companions who have been my pillars of strength and encouragement during this endeavor.

Dear Papa, I appreciate all the sacrifices you've made for our family every day. Thank you for putting aside your ambitions to provide us with the comforts and opportunities that you never had yourself. Your dedication and hard work have always inspired me the most. I believe that this achievement is as much yours as it is mine.

Mentors and coworkers, I want to express my gratitude for your guidance and inspiration that has deeply influenced my perspective and enthusiasm, towards customer experience and the ethical use of technology.

To all the professionals in customer service centers who strive to enhance customer interactions and to those advocating for advancements in technology—this project is dedicated to you. Your commitment to maintaining a balance between innovation and ethics is vital for driving advancements in the future.

Acknowledgment

This thesis represents the end of an adventure that I couldn't have finished without the support and guidance from a lot of wonderful people.

I want to express my thanks to my supervisor, for their guidance and valuable input that greatly influenced the progress of this project development. Your encouragement, in times of uncertainty and your recognition of the significance of this study kept me on track and motivated. Thank you for backing me and encouraging me to aim for perfection.

I want to express my gratitude to my family for their love and sacrifices that have shaped me into who I am today. My father's journey has been a source of inspiration for me. His selflessness and dedication to our family have always put us before himself. This work is a tribute, to his sacrifices and the unwavering strength he has shown throughout my life. I am constantly inspired by his resilience and determination.

To my mom, your quiet strength and unwavering faith in me, got me through the moments. I appreciate you for being my rock and for understanding my worries while always having the words to share with me. You've cheered me on like no other. I wouldn't have made it this far without your backing.

Friends and coworkers, I want to express my gratitude, for your support and attentive ears throughout this time; it has truly meant everything to me. The late-night chats filled with laughter and the shared experiences have lightened my path on this

journey immensely. I feel incredibly lucky to have such a network of encouragement, around me.

A big thank you goes out to all the experts who generously shared their expertise and thoughts with me during my research journey! Your input played a role in the thoroughness and breadth of this study; I truly believe this work showcases the commitment and enthusiasm that you all bring to the world of contact centers and customer experience.

I want to express my gratitude to everyone who has helped in any way to complete this dissertation. Whether through support or technical guidance, every gesture of kindness and aid has been instrumental, in making this project a reality for me.

Thank you all for your support, in making this dissertation a reality! Your contribution, to this achievement is truly invaluable and deeply appreciated by me.

Abstract

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Shaurya Bhasin

The past few years have witnessed a substantial transformation in the functions of contact centers. Call center services have advanced beyond their basic functions to become vital factors that distinguish high customer satisfaction and deliver superior customer experiences. The research investigates the impact of voice analysis technology on customer interactions in contact centers and its implications for implementation.

The study reviews both the existing situation and prospective development of voice analysis technology within contact centers with a detailed evaluation of its effects on response times as well as customer interactions and representative performance. When customer service representatives utilize voice analysis technology it enables them to identify customer emotions and concerns more accurately and deliver suitable responses which enhances customer satisfaction. This study reveals the obstacles and constraints associated with voice analysis technology including data privacy issues

together with accuracy problems and bias while underscoring the necessity of proper implementation and management to minimize misunderstandings or misinterpretations.

The main goal of this research project is to explore how voice analysis technology enhances contact centers by delivering higher service quality alongside increased customer satisfaction and better efficiency. This paper examines the matters of consent and privacy rights and data protection and bias risks which emerge from integrating voice analysis technology. The research focuses on these issues to enhance customer service results while safeguarding both customer trust and rights.

We applied both interviews with experts along with research methods to investigate the study's inquiries. We interviewed experts from industries alongside contact center practitioners to understand how voice analysis technology works in real service situations and its effects on delivery. We executed a customer surveys to determine their perceptions about the technology integration in contact centers. The analytical approach presents insights about efficiency benefits alongside ethical challenges related to using voice analysis tools.

Voice recognition technology is empowering the way of customer service practices in today's world. There is a crucial task for companies seeking to harness this technology's potential without threatening the standards they are trying to improve: finding the harmony between customer experience and ethical standards.

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Chapter 1

Introduction

1.1 Introduction

In today's fast-paced age where everything is interconnected online and customer experience (CX) has become a key focus for businesses worldwide as they strive to stand out in competitive markets through providing not only good products and competitive pricing, but also top-notch service. Because of the fact that today's world of constant competition not only highlights what companies are offering but also how the customer feels about interacting with a company or a brand resulting in loyalty and satisfaction becoming essential measures of effectiveness in the current business world. Contact centers have also changed to meet these new requirements and are now no longer just call facilities but are interactive systems that not only resolve the customer's problems but also collect feedback and build the relationship between the customer and the organization. The change is seen by the fact that over 70% of customers consider customer experience as a factor in their loyalty choices. Therefore, contact centers do belong and are vital when a company wants to adopt a customer-oriented strategy that has a direct impact on its revenue by enhancing customer experience (Verhoef et al., 2009).

Contact Centers have transformed their processes and enhance the customer journey experience by the adoption of cutting-edge technologies like artificial intelligence (AI). Voice analysis has played a significant role in this transformation by evaluating and analyzing vocal aspects such as tone, modulation and pitch to create an instant insights into customer emotions, intentions and sentiments. Customer service

representatives are empowered and can respond in a best possible way to match individual customer's requirement by using the in-depth information by such voice analytics technologies. This highlights the importance of voice analysis technology in developing the customer experience strategies. As cited by (Iacobucci et al., 1995), customers who recognize that they are being understood and empathized by the organizations, are more likely to show satisfaction, loyalty and stickiness towards the organization.

The strategic role of contact centers in modern business.

Contact centers have moved from being merely transactional in nature to being strategic assets that provide valuable insights and customer behaviour that help in shaping the product, marketing strategies and business objectives. Being the first interface between customers and companies, contact centers are usually the initial contact for customers when they have a problem or need help and hence are vital for a brand. As cited by (Ahmed and Omarein, 2024), companies that lead on CX see top line growth of 5-10% and bottom line improvements of 15-25% through higher customer retention rates and lower acquisition costs. This shift also highlights why contact centers are not only there to support, but are also a key part of building customer loyalty and enhancing brand.

In light of changing consumer demands and need of delivering high service quality, contact centers have engaged tools to improve and customize interactions effectively along with the use of AI powered chatbots, automated query routing and real time analytics for enhancing their operations. Of all the technologies mentioned, voice analysis technology is particularly effective as it is able to pick up on the intricacies and

subtleties of an interaction. This is particularly prominent in the growing trend of “empathy in service,” where the customer demands that his or her feelings and issues be understood and attended to with care. Customers will tend to believe and have a good perception toward the brand if their feelings are recognized (Khatoon and Rehman, 2021). This good perception can lead to the customer’s repeat business and recommending the brand to others.

Contact centers, voice analysis technology and cx enrichment via AI.

This is done using advanced machine learning algorithms that analyze multiple cues in a real-time scenario like tone and volume of voice, rhythm, and intonation of the caller, to make inferences about the emotional state, intentions of the caller, or even the level of satisfaction of the caller. This allows the support staff to better refine their responses to the needs of the customers, and, to this end, provides a more personalized and empathetic approach to customer service. As cited by Babatunde et al. (2024), with the use of AI-powered stream technologies, responding and recognizing emotions is key to establishing social connections. Call centers can implement emotion-intelligent service with voice analysis technology.

In addition to that Voice analysis can assist agents in time by informing them of changes in a customer’s emotions or annoyance level. For example, if a customer’s voice shows increasing frustration, then the system may recommend the agent to transfer the call or offer a solution. So, voice analysis does not only enhance customer experience, but also helps agents with useful information on how best to handle their most demanding interactions. This feature is consistent with the concept of “emotion

focused design” in service environments. It stresses the need to consider customer emotional state to enhance satisfaction during interaction (Yoon et al., 2020).

Ethical implications of voice analysis technology in customer service.

While there are benefits, to using voice analysis in contact centers for enhancing customer experience (CX) it is crucial to address the implications that come with it to safeguard customer rights and trust above all else. As cited by (Thapa and Camtepe, 2021), one major issue revolves around privacy concerns since analyzing data entails gathering sometimes sensitive information which may raise questions about the appropriate limits of data utilization, during customer interactions. Many privacy advocates express concerns that gathering and analyzing data without disclosure could result in a phenomenon known as "surveillance creep." This term refers to the situation where companies collect and scrutinize an amount of information than customers are aware of this practice may erode trust, between companies and individuals. Encroach upon autonomy, highlights the importance of disclosing practices to prevent potential breaches of privacy (Levine, 2021). It underscores the significance of an individual's right to manage their information, in evaluating these apprehensions about surveillance activities.

This paper also discusses the issue of consent in the same context. It is possible that consumers may not fully appreciate the extent to which their voice recordings are being monitored, or for what purposes they are being analyzed, creating issues with regard to transparency and consent (Tamburri, 2020). The GDPR (European Parliament, 2016) sets a precedent for businesses to obtain consent for data collection and to inform people of what the data collected will be used for. In real life, especially

when dealing with customers in service related situations where consent and agreement is obtained; a good number of customers tend to miss or not fully understand the implications of these agreements that are presented to them. Weakening of consent can be as a result of lack of awareness in which customers may agree to analysis without fully understanding how extensive or intentional it is (Esmaeilzadeh et al., 2021).

Ethical issues are also an important consideration when it comes to the bias in voice analysis systems and other AI tools that come equipped to seek out patterns from the data that has been entered into the system in the course of its development. This is especially a concern if the data used for training doesn't include a diverse set of voices with accents and dialects that are encountered in customer interactions then there is a chance that the technology may end up favoring certain demographic groups over others (Antoine, 2022). AI systems have been shown in studies to exhibit biases based on gender or race or accent that can result in misunderstandings that can adversely affect service delivery to minorities. Framework of Innovation should be done using governance to detect and address biases proactively so they do not affect users. This approach emphasizes the need for supervision to ensure fairness and equality.

1.2 Research Problem

Contact centers are very important in managing the customer's interactions and keeping customer satisfaction, experience, and loyalty by being the main channel for handling customer queries and concerns. However, this channel is also prone to various challenges for example, dealing with large numbers of calls, the need to respond in real time, and the need to train agents to new and evolving customer needs and products.

To meet these challenges of contact centers of the present time, many have begun to implement new technologies, including voice analysis technology (Sykora et al., 2022). This technology has the potential to increase customer satisfaction by looking at the emotional state and real needs of customers using the vocal attribute analysis methods correctly. Through the use of voice analysis tools, contact centers can give customers responses that are tailored to their needs, sympathetic, which will lead to improved first call resolution rates and decreased customer turnover levels.

The use of voice analysis technology raises ethical concerns. Some of the issues to consider in this case, in addition to the potential for biased outcomes based on vocal traits are: The protection of customer's privacy and the security of data collected. These concerns need to be addressed to prevent the misuse or wrong implementation of this technology which can lead to a break in trust and ethical norms (Murtarelli et al., 2021).

The research will address two main problems; improving and enhancing the customer experience in call centers, and solving the ethical issues of using voice analysis technology.

Improving the customer experience.

As pointed out by Rane et al. (2023), in their research, contact centers are confused about the appropriate application of voice analysis technology to improve customer satisfaction and loyalty without encountering risks. Contact centers are facilities that deal with customer interactions but have a poor record of offering good service quality. Barriers include:

- Customer's frustration and dissatisfaction during peak periods of high call volumes.

- Organization's challenges an ongoing agent training to maintain high performance levels.
- Keeping the right capacity to react promptly and compassionately in time is essential, for ensuring customer contentment and service levels.

Utilizing voice analysis technology could help tackle these obstacles by offering an understanding of customer emotions and feelings in order to enhance interactions on a more individualized and efficient level within contact centers; however; there is still room, for additional research to fully leverage its advantages.

Lately, voice analysis technology is being implemented by contact centers to improve customer interactions; but these new tools come with some ethical concerns that organizations should solve before using them. As the use of technology in the customer experience realm expands, what ethical dilemmas should contact centers address when implementing voice analysis technology, and how can companies guarantee that the technology is used ethically and does no harm to customers? As stated by Foehr and Germelmann (2020), yes, the outcomes of the research conducted with the help of voice analysis can enhance the interactions with the customers, it is better to tackle them now rather than in the future and have unforeseen issues to deal with.

It raises a privacy concern for the company in the process of collecting and analyzing voice data because there is a chance of compromising the customer's privacy if the protocols are not well set, this is an issue that should not be taken for granted. It is crucial to protect this data not only to avoid security threats but also to ensure that customers are comfortable with the company having such information about them.

One important factor to consider is the possibility of the presence of bias in the results obtained from voice analysis technology, which may not capture all the possible variations especially in accents and speech patterns which are not fully captured by the technology.

The research is aimed at identifying the weaknesses and threats and provides solutions to solve them effectively. The goal is to make sure that the application of voice analysis technology in call centers does not only enhance customer satisfaction but also respects and protects customer rights ethically.

In the course of this research an attempt is made to gain an understanding of the merits and difficulties of the voice analysis technology in call centers and to develop recommendations for its ethical use. As such the study will look at how call centers can use voice analysis technology to enhance customer satisfaction while at the same time dealing with issues such as privacy, data protection and possible biases. In solving this problem directly the study seeks to develop a framework for the ethical and optimal integration of voice analysis technology in call centers to improve customer satisfaction and trust in the long run.

1.3 Purpose of Research

This research studies how the voice analysis could improve customer satisfaction in the call center and problems related to this application. The aim is to create an ethical framework that increases customer trust and satisfaction by responsibly using this technology. This study will investigate how contact centers influence customer experience by looking into their impact, especially on customer satisfaction levels and

loyalty. We will also identify the factors that help them manage the customers' interactions effectively (Aburayya et al., 2020).

Additionally, the study will evaluate how helpful voice analysis technology can be to better the customer interactions in call centers. It will help in personalizing and creating empathy. The study will also analyze the impact of the technology on first call resolution (FCR), customer satisfaction and retention.

In addition, the study will look into the factors associated with deploying voice analysis technology, particularly those related to privacy regulation, security of data and risks of bias. We will thoroughly examine the norms and frameworks that pertain to the ethical usage of voice recognition and AI technology.

Research aims to create recommendations for ethically implementing voice analysis technology by suggesting effective privacy safeguards and security protocols while also addressing bias issues head on. To make these recommendations more relatable and applicable, in real world scenarios the study will delve into case studies of companies that have adopted voice analysis technology to explore the advantages and hurdles they faced during implementation. We will collect real world information by conducting surveys and interviews with customers and contact center agents well as consulting industry experts and ethical scholars to gain a variety of viewpoints and insights.

Research will provide recommendations for supervisors in call centers, policymakers and tech experts concerning the proper and ethical use of voice analysis technology. The recommendations made in these suggestions are meant to enhance customer confidence and satisfaction through encouraging the use of transparent and

accountable tech approaches so that the integration of voice analysis tools is a benefit to both business and customers while maintaining very strict ethical guidelines.

1.4 Significance of the Study

Research is done in order to explore on an issue where customer service and ethical considerations are concerned with technology, an area that becomes more important in people's lives in the digital era. The importance of this study is that it can provide an understanding of how contact centers can use voice analysis technology to enhance customer satisfaction and are crucial platforms for direct contact between businesses and customers.

Today customer experience (CX) is not just a passing fad, it is a key determinant of business success or failure in the dynamic and competitive business world. Those organizations that offer CX as part of their strategy are likely to retain their customers and also realize better profits than their competitors. This paper aims to explore how appropriate technology management in customer service centers can be used to deliver outstanding customer experiences that give a company a competitive edge.

Enhancing the customer experience, with voice analysis technology.

The use of voice analysis technology marks a progression in enhancing customer business interactions for companies worldwide. In the past contact centers have typically relied on written scripts and standardized procedures to handle customer queries and issues. While these methods have shown some effectiveness they often fall short in capturing the emotions and feelings of customers result in impersonal and sometimes unsatisfactory customer service experiences. Voice analysis technology has the ability to recognize and interpret cues present, in a customer's voice providing a

means to surpass these limitations by facilitating more tailored and empathetic interactions.

As cited by Loy et al. (2020), studies suggest that tailoring customer experiences can result in enhanced customer happiness and loyalty while also boosting profits. Customers tend to prefer doing business with companies that acknowledge their preferences, history and offer personalized deals and suggestions accordingly. By incorporating voice analysis technology into call centers, companies can improve their grasp of customers' emotional requirements instantly thus improving the experience of customer interactions. This study holds importance as it aims to present real world proof of how voice analysis technology can impact these results and offer companies a guide for enhancing customer experience through innovation, in technology.

Considering ethics, in the adoption of technology.

The use of voice analysis technology raises challenges that should be addressed with caution especially regarding the ethical implications in the business environment as more Artificial Intelligence and Machine Learning solutions are being adopted to enhance the customer interactions. The issues of data protection and potential biases in algorithms have recently gained attention as organizations continue to adopt these technologies. These fears are especially relevant in the context of voice analysis technology that implies the collection and analysis of personal data. The ethical implications of this technology are important in investigation because of the possibility of wrongful use or effect, including reinforcing existing biases and eroding customer trust through the perception of surveillance.

The relevance of this study is seen in the fact that the dilemmas considered are situated in specific fields of interest. This research aims to shed light on how organisations might navigate the complex moral issues associated with voice analysis technology. According to Taeihagh (2021), it is essential to follow ethical standards in order for AI applications to have a positive effect on the community and gain public trust. This study aims to provide organizations with knowledge on how to navigate the deployment of voice analysis technologies in consideration of customer privacy and proper data handling to avoid bias but develop responsible and ethical AI.

Influence, on policies and regulations.

The results of this study are expected to have an impact that goes beyond just specific companies. With the growing incorporation of AI technologies in business activities comes a greater necessity for regulatory structures to guarantee their ethical application. Existing rules like the General Data Protection Regulation (GDPR) of the European Union impose standards concerning privacy and security of information; however they are constantly adapting to keep up with advancements, in technology. This study has the potential to add insights to the current policy conversations by suggesting practical measures for governing the application of voice analysis technology, in call centers.

Government officials as well as regulatory bodies are involved in this matter as this research will be effective in guiding their choices. This research has an in depth analysis of the issues regarding voice analysis technology and offers solutions that can be implemented for its oversight. The research might help build policies that protect consumers and encourage innovation by the business community. It is important to craft

AI recommendations that are sufficiently flexible to cover anticipated technologies and do not lapse in strength to cover harmful technologies (de Almeida et al., 2021). The outcome of this study have a potential to maintain these equilibrium, by guarantee the result of voice analysis technology while maintaining ethical standard.

Adding to the body of knowledge.

From a standpoint, this study fills an important gap in the current literature. While there is a body of knowledge on artificial intelligence and customer interactions, very little attention has been paid to the specific use of voice analysis technology in call centers. The main objective of this research is to bridge this knowledge gap by offering real world data and theoretical perspectives on the implementation of this technology to enhance customer interactions and discuss the implications.

Plus, the study will contribute to academic debate on the ethics of AI, a topic becoming more important as AI expands its tentacles. By exploring the implications of voice analysis technology, the research will provide new perspectives on how organizations can balance capitalizing on AI opportunities while protecting customers' rights and public trust.

This input is valuable given the growing focus on responsible AI, reflected in multiple academic and company efforts to develop ethical AI standards. Ashok et al. (2022), underscore the value of research that goes beyond the technical aspects of AI to explore its societal and ethical impact. This research responds to that call by providing an in-depth analysis of both the ethical implications of voice analysis technology.

Practical applications, for companies.

Research elevates the status of the business world's academic researchers but also has an important impact on real world affairs! Contact centers play a role in customer service excellence and how well they function can directly influence customer satisfaction levels as well as overall business success rates. The research highlights the use of voice analysis technology to increase contact center performance which can be beneficial for companies looking to improve customer services.

Besides, the research focus on aspects makes sure that the recommendations given are not only effective but also long-lasting in the future run. A business can suffer long term damage to its reputation and lose the trust of its customers by ignoring concerns while implementing AI tools. This research is intended to assist businesses in addressing these issues and guidelines for using voice analysis technology. In a study by Tula et al. (2024), the results showed that companies should focus on customer experience and ethical business practices in their efforts to achieve success.

1.5 Research Purpose and Questions

The role of Contact centers has been evolving in the field customer experience. It's not just restricted to answer phone calls and set up to manage customer relationships. In the past, contact centers were primarily responsible for solving customers' problems and processing their requests, and were viewed as cost centers that created no value. But as the business world has become more complex, the focus has changed to the improvement of customer experience as a key performance component of the organization. Credit to the fact that now good customer experience is

a differentiator that improves customer loyalty, increases revenue, and lowers churn rates (Hillmer et al., 2004).

Contact centers are no longer merely organizations that respond to customer complaints, they're a vibrant and integral piece of the company's CX strategy. Using data and technology, contact centers attempt to predict customer needs and offer nuanced and regular customer contact across other platforms. As explained by Dash et al. (2023), this shift is caused by the progress of technology, particularly regarding Artificial Intelligence (AI), Machine Learning (ML), and Natural Language Processing (NLP). This technology has modified the way of managing customer relationships.

AI and ML made automation of daily tasks in contact centers possible, allowing human agents to spend more time working on the advanced, challenging, and physically demanding cases. These technologies can understand complex data, recognize patterns, and predict behavior to improve customer service processes and overall efficiency. Chatbots driven by artificial intelligence handle most of the shallow inquiries, while machine learning assists in understanding customers' probable behavior and preferences and thereby provides improved and prompt services (Ekechi et al., 2024). However, NLP has also contributed significantly to enabling contact centers to understand and handle conversations in natural language, which could further improve the communication quality between customers and service representatives.

The rise and effect of voice analysis technology.

In contact center technology, one of the most exciting innovations is the use of voice analysis (a sub-field of speech analytics). The voice analysis technology examines different acoustic features of a customer's voice such as tone, pitch, rhythm,

and speaking rate to predict emotional states, stress levels, and intent. Bromuri et al. (2021), explain that by making sense of these vocal patterns, contact centers help better understand the state of the customer, which significantly increases the chances of the conversation proceeding positively.

Voice analysis can be incredibly powerful, especially when combined with the importance of real-time understanding of customer interactions to avail results that help you connect the dots between customer patterns and processes. For instance, if the customer is angry or upset, the system can alert the agent or supervisor to resolve the issue quickly, escalate the matter to a manager, or a more senior executive. This technique may also be used proactively to minimize potentially negative interactions from blowing up and to improve customer satisfaction (Herhausen et al., 2023).

In addition, they can use voice analysis technology for moderating and providing feedback on an agent's performance. Through comprehension of the interactions, businesses can verify that representatives are following rules, have the correct attitude, and are good at adapting to customers' feelings. Further, Milne-Ives et al. (2020), noted that it also serves as a collection for training purposes, which helps agents improve their communications to provide better services.

Beyond augmenting specific discussions, voice analysis can be used to classify general feelings and trends in customers' voices. In this way, after analyzing and gathering information from hundreds of contacts, companies are able to have an average of customer satisfaction, identify the main problems they face and, above all, how to enhance their products and services. As a result, connecting AI-powered voice

analytics systems with on-premise CRM software will improve the quality of customer service interactions and make them more specific and concise. With voice analysis, companies can derive insights from every customer's words and tone to understand their needs and interests better, thus ensuring more meaningful engagement.

Yet, their adoption comes with serious ethical issues that need to be carefully evaluated. Privacy, consent, algorithmic bias, and data security are the key ethical issues that need to be addressed in relation to voice analysis technology.

Privacy and consent.

Because voice analysis technology requires collecting and analyzing voice data, it is considered sensitive personal data. Along with the actual content of said conversation, this data can also encompass biometric information such as the voiceprint itself, allowing for accurate identification of individuals. According to Godinho de Matos and Adjerid (2022), the GDPR, as well as other privacy laws, enforce organizations to obtain customers' consent before they can collect and analyze voice data. But when customers aren't exactly sure what's going to happen to their data, it can be tough to get truly informed consent. It may raise customers' concerns about the privacy and potential malicious usage of their personal information, which is not transparent.

Algorithmic bias.

If the training data is not representative of the diverse population served by the contact center, then the algorithms may have biases that treat customer groups unfairly. Algorithms trained primarily on one demographic will not understand the emotional intents of consumers from different groups, leading to misinterpretation and resulting in wrong conclusions, potentially leading to discriminatory outcomes (Orwat, 2020). There

are biases in these models' training data such that monitoring these algorithms is necessary to ensure fair and accurate use.

Data security.

On the security level, the storage and processing of voice data is problematic. Voice data has overtaken other data, being strictly information-sensitive in the cyber threat landscape, and its compromise can lead to the theft of sensitive customer data, and the loss of trust which comes with this and the potential for legal consequences (IET). An approach to mitigate these risks is for organizations to establish strong data protection measures, such as encryption, access controls, and periodic security audits, to secure voice data while being stored and used (Omotunde and Ahmed, 2023). However, organizations must abide by different legal requirements, such as GDPR, which stipulates strict consequences for the violation of data security and privacy.

Trends over time and future prospects.

This will surely be the futuristic tool contact center for both industries in the field of AI or for voice analysis. One major trend is the combination of voice analysis with other AI-driven technologies, including sentiment analysis, predictive analytics, and customer journey mapping. This convergence is aimed at giving a more holistic insight into the customer communicative engagement, so organizations can provide better and more personalized customer service (Albrecht et al., 2021).

For instance, voice analysis combined with sentiment analysis can help in disclosing customers' emotional state more accurately while predictive analytics can provide insights into the customers' future needs using historical data. In fact, the holistic approach enables contact centers to move from reactive problem-solving to

proactive customer engagement, where potential issues are resolved before they become problems (Malone, 2022).

A second practice starts to become established with ethical frameworks and industry standards for the responsible use of voice analysis technology. As AI and voice analysis become more prevalent in contact centers, now is the time to address the need for guidance that will help bring out the benefits of these technologies without trampling on customers' rights. The use of voice analysis AI technologies is also on the rise, and regulatory authorities, industry groups, and technology companies are increasingly focusing on establishing ethical standards for their transparent, fair, and accountable use (Longo et al., 2020).

Chapter 2

Review of Literature

2.1 Theoretical Framework

The framework is a conceptual base for understanding how contact centres contribute to better customer experience (CX) and it addresses ethical issues which come with the adoption of new technologies, such as voice analysis technology. It aims to integrate the main theories in the area of customer service, technology adoption, and ethics to help guide the dissertation research on how the use of voice analysis tools is changing contact centre operations and the way it interacts with customers. It will also look at the ethical issues raised by these technologies in relation to privacy, consent and bias.

Theory of customer experience (CX).

Customer experience (CX) is a set of ongoing business operations that enable companies to interact and engage with their customers throughout their end-to-end lifecycle and extends beyond just CX programs. CX dynamics relate to many underlying theories and concepts like Service Dominant Logic (SDL), Customer Experience Management (CEM), etc.

Service Dominant Logic (SDL) establishes through collaborative exchanges that value only emerges between the customer and service provider effectively in the contact center context (Vargo and Lusch, 2004). The quality of service rendered is not the only factor that determines the customer experience because it depends on the interaction. Contact centers play a crucial role in supporting this process by delivering personalized and efficient support.

The Customer Experience Management (CEM) Framework emphasizes the need to manage and optimize every touchpoint in the customer's journey. Contact centers are an important part of customer engagement, customers form their impressions of a brand's commitment to top-quality service. CEM emphasizes the significance of synchronizing contact center operations with customer needs and expectations to enhance the customer journey.

Oliver (1980), describes Expectancy Disconfirmation Theory (EDT) which asserts that levels of customer contentment hinge on the level at which a contact center meets or exceeds customers' service quality expectations and their impressions of it. Advanced technologies, such as voice analysis tools, are being used in contact centers to provide insights into customer emotions and requirements to improve service accuracy and responsiveness. According to the theory, exceeding customer experience can lead to an increase in customer satisfaction and loyalty when expectations are surpassed.

Introduced by Davis (1989), the Technology Acceptance Model (TAM) provides a conceptual basis to investigate how individuals incorporate and use technology into their daily lives. TAM indicates that the main drivers of technology adoption in the context of voice analysis technology deployed in contact centers are perceived ease of use and perceived usefulness by users.

The positive aspect of voice analysis technology is that by harnessing the data it collects regarding customer sentiments, emotions, and intentions, it can be used to improve services provided to customers, making it the most significant performance booster for contact centers. For instance, this technology enables agents to tailor their

responses more effectively so that solutions can be provided after predicting consumer behavior, leading to improved customer satisfaction.

Perceived Ease of Use theory states that one of the most critical aspects of technology adoption is the degree of integration of this technology with current processes, especially when it comes to the use of voice analytics tools in contact centers. Agents will be more accepting of the technology if the technology is user-friendly and can be smoothly implemented into operations. This acceptance often accelerates performance and improves customer experience (CX).

The key to leveraging voice analysis technology in boosting the productivity of contact centers is understanding how effective they are, which in turn leads to better customer satisfaction levels.

Voice analysis technology is considered an innovation that has the potential to disrupt the industry.

Voice analysis technology could be examined from the perspective of Disruptive Innovation Theory (Christensen, 1997). This theory suggests that new technologies shake up existing markets by bringing in more effective solutions. Voice analysis is a rising technology that could potentially revolutionize contact center operations by providing.

Voice analysis technology in time can detect emotions by analyzing the tone of voice and speech patterns of customers to help agents tailor their responses based on the cues they perceive. Through the use of data analysis, in voice recognition technology systems can foresee customer requirements and issues ahead of time. This enables call centers to offer assistance to their customers. Monitoring agent

performance, through voice analysis tools helps maintain consistency and quality of service by ensuring adherence to scripts and tone guidelines, as performance metrics. These new developments have the potential to improve the customer experience. Also bring up ethical concerns related to privacy and fairness when individuals are unaware that their emotions are being scrutinized.

Exploring the aspects of integrating technology into everyday practices.

The ethical considerations surrounding the use of voice analysis technology are intricate and varied drawing insights, from ethical frameworks to shed light upon these issues. The concepts to be examined below are:

Utilitarianism emphasizes the importance of enhancing welfare and happiness in ethical decision making processes. When considering voice analysis technology through a lens it can be seen as advantageous when it enhances customer experience increases satisfaction levels and improves operational efficiency.. Its use may also raise ethical concerns if it results in manipulating or exploiting customer emotions or if its benefits skew towards benefiting the company more, than ensuring the overall welfare of customers is taken into account.

Deontology Ethics focuses adhering to moral principles or duties when determining ethical actions in voice analysis technology deployment. The key considerations include respecting customer autonomy, safeguarding consent and upholding privacy issues. Ethical dilemmas emerge when customers lack information, about the technology or when their data is utilized without explicit permission.

In Virtue Ethics theory it focuses on the character of the decision maker, than outcomes or rules, in contact centers using voice analysis technology must cultivate a

culture of integrity transparency and respect application of these tools necessitates agents and organizations to engage with customers honestly and fairly.

Vital ethical issues.

It is essential to consider various factors before making decisions. The issues are as follows:

Informed Consent: Customers should be specifically informed that their voice is being analyzed, and consent must be obtained before any data is collected or processed.

Privacy Problems: Voice data collection and storing has many sensitivity issues which can breach users' privacy. Unless pseudonymous, data must be processed in compliance with a privacy law (e.g., GDPR), or such data must be obtained in conjunction.

Bias and Discrimination: Voice analysis systems can inadvertently amplify biases if not properly calibrated. The algorithms themselves may find it difficult to understand accents, gender, or emotional expression, which could lead to people's treatment or bias. Ethical concerns arise if these biases remain unrecognized and unmitigated.

Transparency and Clear Accountability: It must be clear to both customers and agents how voice analysis technology works, what data is being collected, and how that data is used. Transparency breeds trust; failure to account for such incidents can cultivate distrust among customers and risk damaging reputation.

The paper integrates existing theories about customer experience management, technology acceptance and ethics to develop a theoretical framework for how voice analysis technology could improve contact center's customer experience(CX). "These

technologies offer enormous potential to enhance the quality of services and customer experience, but they need to be used thoughtfully so as to uphold ethical priorities such as privacy, consent, and fairness." The framework leads an inquiry into how the technologies may benefit contact centers, and how these contact centers might employ these technologies in disparate ways while remaining ethical within the means of making sure that the customer experience is enhanced and customers' rights and well-being are not compromised.

2.2 Theory of Reasoned Action

The Theory of Reasoned Action (TRA), as cited by (Zhang et al., 2019), is one of the most influential theories used to explain and predict human behavior, particularly decision-making. At the center of discussion within the contact center environment, and especially with the implementation of voice analysis technology, TRA offers important insights into the factors that determine agents' readiness and willingness to embrace and use this technology effectively. This section discusses the elements of the TRA and how they apply to the improvement of customer experience (CX), as well as the ethical implications of voice analysis technology.

Components of theory of reasoned action.

The way people evaluate behaviors as good or bad constitutes the attitude toward the behavior. The attitude which contact center agents hold toward voice analysis technology determines their behavioral intention in their workplace. The likelihood of agents adopting this technology becomes higher when they believe voice analysis tools will lead to improved performance through faster work and superior customer interactions and reduced mental strain (Judge et al., 2022). Voice analysis

provides agents with immediate customer emotional understanding which they can use to create more effective responses. The positive perception develops because of this thinking which drives agents to adopt the technology and integrate it into their work to enhance customer experience.

Negative perceptions about voice analysis as an intrusive tool will decrease agent willingness to properly adopt and use the technology. Several elements contribute to the opposition against implementing voice analysis technology like the practice of traditional customer interaction methods for many years creates resistance among agents who must transition to technology-based approaches. The fear of becoming redundant through automation practices leads employees to resist the adoption of new technology. The practice of conversation analysis makes agents uncomfortable which creates skepticism and opposition toward the practice. The organizational culture of workplaces that do not actively support technological adoption and change resistance makes agents less willing to accept new tools. The failure to provide sufficient training and support prevents employees from using voice analysis effectively which leads to decreased adoption rates.

Subjective norms, are the perceived social pressure to perform a behavior. In contact centers, these norms can be generated by the organizational culture, peers, and management expectations. If the organization supports the use of voice analysis technology and claims it is essential for providing excellent customer service, agents will have the feeling that they should use it (La Barbera and Ajzen, 2020). For instance, if management itself stresses voice analysis as a key tool in customer understanding and if management also encourages agents to post their success stories, then the positive

subjective norms may greatly improve agents' intentions to adopt the technology. However, if peers are doubtful about the effectiveness or morality of the technology, then this may discourage agents from using it to the best of their ability, thus affecting the overall customer experience.

The following real-world examples demonstrate how subjective norms affect the adoption of certain practices:

Amazon Customer Support: The company has implemented AI-powered sentiment analysis tools as part of its customer service operations (Ahmed et al., 2022). The company's data-driven culture and customer experience focus creates a powerful motivation for agents to adopt voice analysis in their work environment.

Salesforce Call Centers: Salesforce encourages its customers to use AI-driven analytics for customer interactions which leads to an expectation that their support teams will implement these tools to improve customer engagement.

The implementation of voice analysis technology in banking and similar regulated industries occurs mainly for both fraud detection and compliance purposes. The necessity of voice analysis for security receives emphasis from management and compliance teams which leads agents in these organizations to adopt this technology.

Negative subjective norms about voice analysis effectiveness or fairness which stem from colleague doubts regarding potential biases and micromanagement practices will discourage adoption and reduce its effect on customer experience.

Behavioral Intention, as explained by (Pal et al., 2020), a positive attitude combined with supportive subjective norms increases the strength of the intention to use the voice analysis technology. If agents have positive feelings towards the

technology and think that their peers and managers support the use of the tool, they are more likely to adopt it into their work life. This is important as it is the intention that leads to the actual use of the technology to improve CX. In turn, through the use of voice analysis technology, agents are able to pick more details from the customers' emotions and preferences and, therefore, provide the right responses. This enhanced interaction quality may result in improved customer satisfaction and loyalty, which highlights the need to consider behavioral intentions in the process of technology adoption.

The integration of TRA with ethical considerations also underpins the necessity of building an ethical organisational culture when using voice analysis technology. Where the workplace environment is more likely to be characterised by transparency, informed consent, and respect for customer privacy, agents are more likely to have more favourable attitudes towards using the technology responsibly. Moreover, if the subjective norms are based on ethical norms such as fairness, non-discrimination and customer well-being then the agents will be more likely to adopt the voice analysis in an ethical manner. This alignment between the behavioural intentions and ethical considerations is very important in order to make sure that the deployment of the voice analysis technology improves the customer experience in a way that is ethically sound (Grewal et al., 2020).

As for the Theory of Reasoned Action, it can offer an integrative framework of how contact center agents' attitudes and subjective norms affect their adoption of voice analysis technology. Thus, the recognition of these factors can help organizations to navigate the integration of innovative technologies in a way that will improve customer experience and solve the ethical issues that are inevitable when using such

technologies. In this way, as contact centers are shifting and changing, using the TRA can help in the formulation of plans that encourage the right attitudes and ethical behaviour, which in turn will benefit both agents and customers.

2.3 Human Society Theory

The Human Society Theory, stresses the interdependence of people and social structures and the role of norms, values, and technologies in the society in the behavior of individuals. In the context of contact centers, this theory can offer important insights into the processes that determine customer experience (CX) and the ethical issues involved in the use of voice analysis technology. Realizing the role of societal frameworks in the shaping of individual interactions within contact centers can also help us appreciate the implications for agents and customers (Bolton et al., 2018).

Agents and Customers interconnectedness, “Social Theory of Human Society” was developed with the understanding that individuals are not autonomous entities but are members of families, communities, and societies that affect their thinking, feeling, and action. In contact centers, customers and agents are in a constant feedback loop where each side’s expectations, feelings, and actions are determined by the society they are in (Qiu and Benbasat, 2009).

Social Norms and expectations as per which customers have certain expectations of service and personalization based on social norms at the time when the research was conducted. In the world of instant communication and information, customers demand a lot and are quick to demand it. Contact centres have to meet these societal expectations in order to improve the CX.

Role of Agents are the face of their organizations and therefore work in an organizational culture that is consistent with societal values. They are not just order processors; they represent the norms and ethics of the society in which they function. The integration of voice analysis technology can increase this effect by helping agents understand customers' emotions to engage with them more effectively.

The introduction of voice analysis technology is an additional way of interacting between agents and customers which is in line with the Human Society Theory that focuses on the influence of technology on the society. With the improved communication of agents are able to get real time information on customers' emotions and sentiments through voice analysis technology. This makes the communication more effective since the agents can reply to the customers' needs as directed by the customers' voice.

The ability to respond empathetically creates a better shopping experience and, in turn, supports the social expectations of personalized service. The use of technology can also shift the balance of power between agents and customers. Customers who are aware of the existence of voice analysis technology may require better treatment from the agents. Hence, the technology can be a resource for the agents and at the same time a way for customers to express their requirements of quality services, thus supporting the social norms of service quality.

Human Society Theory also deals with ethical issues in the process of technology adoption in social settings. Contact centers that use voice analysis technology are also not exempt from the ethical issues that come with it:

Informed Consent and Autonomy

It is very important that the customers know that they are being watched and their emotional state is being measured. This paper also underscores the need to adhere to the principle of informed consent in order to gain the customers' trust and to respect their autonomy (Schweidel et al., 2022). Ignorance of these ethical issues may produce a negative perception of the technology and the organization.

Privacy and Data Protection

The use of voice data also raises significant privacy concerns. It is crucial for organizations to ensure that data protection policies such as GDPR are used correctly and legally. Therefore, the concern for the customer's privacy and data security aligns the practices of contact centers with social values of the protection of individual rights (Gruschka et al., 2018).

Bias and Fairness

If not used correctly, the technology which is based on the voice analysis can also continue the existing biased policies. As illustrated by (Ray, 2023), the algorithms may not always be accurate at identifying the accent or emotional state of customers which could lead to unequal treatment of the customers. These biases must be eliminated not only because it is the ethical thing to do but also because it is important to make sure that every customer is being treated equally.

The Human Society Theory offers a conceptual framework for analyzing the processes through which contact centers work to improve customer experience and the ethical implications of implementing voice analysis technology. Thus, understanding the agency of agents and customers in relation to each other and the role of societal norms

and values, organizations can create plans that lead to more productive interactions that are also ethical. In conjunction with the advancement of technologies in contact centers, the principles of the Human Society Theory will be crucial in ensuring that the integration of voice analysis technology has a beneficial impact on customer experience and ethical practices.

2.4 Summary

The literature review offers a wide discussion of the theoretical frameworks that help to explain the crucial part that contact centers play in improving customer experience (CX) and the ethical issues that are connected with the application of voice analysis technology. At the beginning, the review focuses on the importance of Service Dominant Logic (SDL) and Customer Experience Management (CEM), which focus on the relationship with the customers and the management of the points of contact. These theories propose that the interactions between the customers and the service providers create value, thus stressing the importance of contact centres in developing good customer relationships.

In addition, Expectancy Disconfirmation Theory (EDT) states that customer satisfaction is a function of the comparison between the performance of a contact center and the expectations that customers have, which supports the need for excellence in service delivery. The Technology Acceptance Model (TAM) adds complexity to this framework by proposing that perceived ease of use and perceived usefulness are the main factors that influence agents' decision to use the voice analysis technology. This knowledge is important in order to guarantee the correct implementation of new tools in the contact center operations.

The Theory of Reasoned Action (TRA) contributes ideas on how behavioural intentions are formed from individual attitudes and subjective norms of the agents in relation to technology use. Positive attitudes towards the voice analysis technology which are based on the believed consequences of the technology to enhance service delivery may contribute to agents' adoption of the technology. Subjective norms which are determined by the cultural perception within the organization and the peer pressure are very critical in this process as they require that the working environment should support the use of technology.

Furthermore, the Human Society Theory looks at the relationships of the agents and the customers in societies and the effects of the societies on the behaviours. It demonstrates how the use of voice analysis technology can improve the communication between agents and clients by giving agents real-time information about clients' emotions, thus making every interaction consistent with social norms of a caring and individualized approach. Nevertheless, the application of such technology brings ethical concerns such as informed consent, privacy, and biasness by algorithms. Organizations must approach these challenges with caution to make sure that the use of voice analysis technology enhances the customer experience while at the same time, the rights of individuals and society are protected.

Finally, the literature review integrates these theoretical contributions and stresses the need to balance the implementation of technological innovations and ethical principles in contact centers. It also reveals the need to strike a good balance between the improvement of the customer experience and the ethical dilemmas that

come with the implementation of new technologies and informs the direction of future study and application '*See Appendix 1.1 for Human Society Survey*'.

Chapter 3

METHODOLOGY

3.1 Overview of the Research Problem

Contact centers are a central component of modern business operations, serving as the frontline for customer interaction and problem resolution. In the Gulf Cooperation Council (GCC), including Oman, organizations increasingly rely on contact centers as a critical channel to maintain competitiveness in service-driven markets. With rising customer expectations, businesses are turning to artificial intelligence (AI) tools particularly voice analysis technology to enhance operational efficiency and improve customer satisfaction.

Voice analysis technology refers to the use of AI-driven tools to process and interpret vocal attributes such as tone, pitch, pace, and pauses in real time. These tools are often paired with sentiment analysis, which identifies the emotional state or intent behind speech, providing organizations with deeper insights into customer behavior and stress levels. When integrated into contact centers, such systems can enhance personalization, identify customer frustration earlier, and improve service delivery.

However, the adoption of voice analysis in contact centers also raises serious ethical and regulatory challenges. Concerns include potential violations of privacy, lack of informed consent, unclear data ownership, and risks of algorithmic bias. For example, analyzing customer voices without transparent disclosure about how the data will be stored, shared, or used undermines trust and raises questions about compliance with data protection standards. Moreover, biases embedded in recognition algorithms can

lead to discriminatory outcomes or misinterpretation of emotions, especially in multilingual and culturally diverse regions such as the GCC.

While there is growing research on AI in customer service globally, there is a notable gap in studies focusing on Oman and the wider GCC context, where regulatory frameworks for AI ethics and data protection are still developing. This gap is significant because local cultural norms, customer expectations, and legal environments may shape how voice analysis is perceived and implemented. Understanding these regional dynamics is essential for both policymakers and organizations considering adoption.

This study therefore seeks to examine both sides of the issue: the potential benefits of voice analysis technology in improving service quality, and the ethical risks associated with its deployment. To do so, it employs a mixed-methods approach. First, qualitative methods (e.g., interviews and focus groups) will capture in-depth perspectives from customers, employees, and managers in contact centers. This will be followed by quantitative surveys to measure broader trends and validate findings across a larger population. The combination of methods allows for both nuanced understanding and empirical generalization, ensuring that the research captures lived experiences as well as measurable patterns.

This study investigates the following essential questions:

Question 1. What specific benefits does voice analysis technology offer for enhancing customer experience in contact centers?

Question 2. What ethical challenges emerge from voice analysis adoption in customer interaction?

Question 3. How do customers and employees perceive the use of voice analysis in contact centers?

Question 4. What legal and ethical frameworks govern the use of AI-driven voice analysis in customer service?

By addressing these questions, this research contributes to the global debate on the ethical use of AI in customer service, while providing region-specific insights for Oman and the GCC. Ultimately, the study aims to inform businesses, regulators, and policymakers on how to adopt voice analysis responsibly—balancing innovation with the protection of customer rights and trust.

3.2 Operationalisation of Theoretical Constructs

This research explores how voice analysis technology affects operations within a contact center by focusing on the following four constructs: Customer Experience (CX) Enhancement, Voice Analysis Technology Adoption, Ethical Issues and Regulatory and Ethical Frameworks. Each theoretical construct was operationalized based on existing literature into measurable dimensions; however, items were adjusted to fit the sociocultural and regulatory context of Oman and the GCC region. Respondents will use a five-point Likert scale—1 (strongly disagree) to 5 (strongly agree)—to answer the items related to each construct, which will be summed to create mean aggregate scores. Then the following analyses will be conducted to ensure statistical rigor: reliability and internal consistency through Cronbach's alpha, validity confirmed via exploratory and confirmatory factor analyses and expert review in the pilot stage.

Customer experience (CX) enhancement.

Customer Experience refers to what the customer perceives from their interaction with the contact center, established by both the functional and relational qualities of communication. This study conceptualizes CX through three dimensions: service effectiveness, relational engagement, and satisfaction. Service effectiveness captures the effectiveness and quality of services rendered and response effort based on response time, first-contact resolution and obtaining support ease; therefore, it uses three items based on the Customer Effort Score (CES) and SERVQUAL constructs, including: "My issue was resolved in the first call without needing a follow-up." Relational engagement captures the interactional components between agents, including personalization, empathy, and involvement with previous customer history; thus three items from SERVQUAL are utilized, including: "The agent referred to my past interactions to provide relevant support." Finally, satisfaction assesses overall attitude and customer loyalty; therefore, three items from CSAT and Net Promoter Score (NPS) are used, including: "I am satisfied with the support I received during this interaction." In total, nine items assess the CX theoretical construct but in a logical way that minimizes redundancy while providing reliable assessment.

Voice Analysis Technology Adoption measures how well the AI-powered voice analysis is adopted and used in daily contact center operations. This is measured through three dimensions: extent of adoption, accuracy/effectiveness and human role impact. Extent of adoption examines how consistently voice analysis tools are used across the customer base; therefore, two items are used for dimension measurement, including: "Voice analysis tools are consistently used across all customer calls."

Second, accuracy/effectiveness measures how accurately emotion interpretation occurs during interactions; thus three items assess this dimension, including: "The system correctly interprets customer emotions during interactions." Finally, the dimension assessing how much AI tools encourage or detract from human agent work measures with two items such as "Voice analysis tools provide real-time suggestions that improve my work performance." In total, there are seven items which allow for insight both on adoption as well as immediate operational impact.

Ethical issues in voice analysis.

Ethical Issues explored concern related to privacy versus usage, consent-based participation, data protection (i.e., recording and retention) and perceptions that some accents produce better responses than others. This includes three dimensions: transparency/informed consent, data security and algorithmic bias.

Transparency/informed consent is assessed through two items adapted from AI ethics studies; for instance: "I was clearly informed about how my voice data would be used."

Data security assesses where voice analysis data is stored/processed/reviewed and includes two items assessing trust in institutional review, such as "I trust the organization to store and handle my voice data securely." Finally, algorithmic bias assesses whether various identities are treated equally across performance; therefore this dimension is captured by two items such as "Voice analysis systems interpret emotional tone fairly across different accents and genders." In total six items assess Ethical Issues but in a comprehensive fashion that ensures clear connection to the theoretical construct.

Regulatory and ethical frameworks.

Regulatory and Ethical Frameworks questions assess whether organizations use voice analysis technology are held accountable by consumer regulators, ethical legal obligations to adhere to privacy/policy changes and whether organizational acts are challenged by internal roles. This includes three dimensions: compliance with standards, protection of customer rights/organizational claims and oversight/accountability. Compliance is assessed by two items; for instance: "The organization's voice analysis practices comply with relevant regulations." Protection of customer rights is assessed using two items based on accessiveness of technology/recommendations or using "I can easily request that my voice data be deleted if I wish." Finally, Oversight/accountability is assessed using two items clarifying whether independent regulators oversee participation; for instance: "Independent regulators provide sufficient oversight of voice analysis technology." In total there are six items which ensure successful assessment across theoretical measurement.

Ultimately, there are 28 items across all four constructs assessed: 9 for CX Enhancement; 7 for Voice Analysis Technology Adoption; 6 for Ethical Issues and 6 for Regulatory Frameworks. Each theoretical measurement was deconstructed to minimize overlap but ensure comprehensive assessment with purposeful language. Reliability will be confirmed with Cronbach's alpha (>0.7), thereafter internal/external validity confirmed through factor analyses and expert reviews ensure cultural context remains relevant. Therefore, operationalized constructs allow for situational relevance at this investigative stage with a systematic approach for measuring how voice analysis

technology impacts customer experience in contact centers both within Oman and the greater GCC.

3.3 Research Purpose and Questions

This research intends to understand the impact of contact centers on quality customer experience, in addition to the ethical, legal, and practical considerations of employing voice analysis technology. As more organizations embrace voice recognition technology and sentiment analysis powered by artificial intelligence, there are growing opportunities to improve contact center operations and customer service quality through added efficiency and personalization. However, with such powerful technologies comes potential for ethical violations, privacy intrusion, and neglect of informed consent. Therefore, a better understanding of the technology's capabilities and challenges can shed light on the most ethical, legally defensible use in practical settings.

This study aims to:

- Explore how voice analysis technology improves customer experience in terms of service quality, efficiency, personalization, and overall satisfaction during customer contact center interactions.
- Determine which ethical considerations are present when adopting voice analysis technology for customer interactions in contact center operations, such as concerns of privacy, bias for analyzing emotion/sentiment, and failure/inclusion to employ informed consent.
- Analyze how customers and employees view the implementation of voice analysis technology in contact centers to determine its reception and impact on perceived service quality for customers and work efforts for employees.

- Investigate existing legal/ethical frameworks established for the use of AI-driven voice analysis technology in customer service operations to understand the gaps/challenges in compliance.
- Propose evidence-based recommendations for the ethical/practical use of voice analysis technology for contact center operations to ensure organizations can adopt new technologies while maintaining customer trust and legislative compliance.

The research will yield quantitative and qualitative results. On a quantitative basis, the research will assess levels of customer satisfaction, quality of perceived service, awareness of ethical challenges, and extent of adoption attributable to voice analysis technology and provide confidence statistically beyond a simple percentage gauge from standardized response options. On a qualitative basis, the research will explore employee and customer experiences through interviews or open-ended response opportunities, allowing for real feelings, explanations, and insights that cannot be captured through standardized surveys.

Research Questions

1. What specific benefits does voice analysis technology offer for enhancing customer experience in contact centers?
2. What ethical challenges emerge from voice analysis adoption in customer interaction?
3. How do customers and employees perceive the use of voice analysis in contact centers?

4. What legal and ethical frameworks govern the use of AI-driven voice analysis in customer service?

Thus, answering these questions will create an opportunity for organizations to better understand the implementation of AI in customer-focused areas with both a practical mindset for operating successful business initiatives and a regulated approach to ensure compliance in the GCC with ethical considerations. The results will be used for strategic planning as well as practical applications that improve customer experience without sacrificing ethics or legal concerns.

3.4 Research Design

This research uses a mixed methods research design. Qualitatively and quantitatively measure a deeper, fuller understanding of both how contact centers enhance customer experience and the ethical implications of voice analysis technology. Thus, the mixed methods allow for numerical results to imply extremes and correlations while the qualitative results provide the contextualization and greater appreciation of the human behind the data.

Sequence of procedures.

The proposed study will follow a sequential exploratory design, combining qualitative first and quantitative second. The qualitative approach comes first to understand what findings regarding voice analysis technology, ethical considerations, and regulatory suggestions emerge from the first phase to the second survey creation and construction/focus of a more quantitatively driven second phase.

Qualitative Phase:

Semi-structured interviews with industry professionals, upper management in contact centers, and regulatory agencies will seek to discover best practices, ethical risks, and gaps in regulation that exist.

Then, focus groups with contact center workers and consumers will address perceptions of the technology from hopefuls to fearfules to projected potential.

Quantitative Phase:

A structured survey based on the results from the qualitative phase will be sent to a broader range of contact center employees, consumers, and middle management. The goal is to understand the consumer experience via qualitative measurements, exposure to AI voice analysis technology, and privacy and ethical treatment concerns.

This two-part research approach ensures that the survey component is more focused and meaningful because it comes from the experiences of Part One.

Sampling procedures.

There are three populations of interest to emerge from the study:

- Consumers who have interacted with a contact center to obtain information/help;
- Individuals employed by contact centers (in any role) including management;
- Regulators who focus on compliance/professional ethics connected to AI.

Purposive sampling will be used to determine potential respondents for semi-structured interviews as they possess knowledge/experience directly using processing voice technology or experiences with customer service connected to policy and regulation. This affords the study expert insights that create the larger ethical and operational picture for consideration around voice analysis.

Multistage stratified random sampling will form groups for focus groups as diverse groups will be needed based on age/gender/industry type/general experience. This affords each new group a different experience with/from voice analysis technology to gather diverse responses as educated consumers/employees.

A similar stratification will occur for the survey component to ensure representation of customers/employees under like categories. A minimum of 20 survey participants will be required from both customer and employee sides to yield enough aggregate impressions to be statistically relevant.

In total:

Interviews: 1-2 experts in the industry/regulation interviewed in-depth

Focus groups: 3 separate groups with 6-8 persons each (mix of customers/contact center employees)

Surveys: 20+ participants between customer/employee categories

These sampling strategies align with establishing relevance, diversity, and connection to the ultimate research questions to better understand how voice analysis technology can be applied (pragmatically) and what concerns must be in place when it is regularly used.

3.5 Population and Sample

Target population.

The population of interest for this study is not universal but rather deliberately bounded by geography and stakeholder role for relevance and feasibility. Instead of trying to encompass the perspectives of all the global users of contact centers, the research targets the people and groups that are closely related to such centers and

voice analytics technology usage within the boundaries of Oman and, to some extent, the greater Gulf Cooperation Council region. These constitute the most immediate and available people whose experience, daily activities, and decisions are impacted and formed by voice analytical practices, this population includes:

Consumers: Persons who need access to a contact center for voice-related issues in banking, telecommunications, health care and e-commerce.

Employees of Contact Centers: The customer service agents and management and oversight teams who answer questions from customers.

Industry Professionals: Those who work in the AI field, developers of voice analytics software, and professionals who specialize in the ethics of voice analytics AI.

Regulators: The legislators who determine AI ethical standards as well as data regulatory compliance and consumer rights.

Sampling strategy.

The following sampling strategy allows for representation across all relevant stakeholders for and against implementing voice analysis technology in contact centers. The research will use a stratified and purposive sampling strategy by focusing on three groups of relevant stakeholders. These three groups include the customers, contact center employees, and industry experts/regulatory officials from Oman and GCC. Each sampling approach aims to gain the most variety of perspective for operational functionality and ethical concerns of voice analysis technology.

Customers: The customer group will be selected via stratified random sampling from all different sectors within the banking, finance, and insurance industries where contact centers typically facilitate communication. This aligns with the interest area's

focus since the banking, finance, and insurance industries utilize contact centers frequently for customer-service-oriented needs. Therefore, 20 respondents from Oman, who have interacted with a contact center in the past six months will be surveyed for effective results and channels to learn more about how this technology works to improve customer satisfaction and personalization efforts—or if it lacks customer compliance via privacy concerns without adequate consent. This feedback relates to the research questions regarding customer experience and ethical implementation approval.

Contact Center Employees: Similarly, contact center employees will be selected based on stratified random sampling. This group includes front line agents, team leaders, and managers to create a well-rounded approach to employee experience. There will be 20 employees surveyed who are currently working in a contact center that has adopted voice analysis technology available or in the trial period for structure and positioning. This group helps answer research questions surrounding the effectiveness of the voice analysis tools, customer service facilitated through this technology, dependence on AI recommendations by agents, and ethical concerns from a peer perspective.

Industry Experts/Regulatory Officials: Finally, to address the legal and regulatory premises of implementing such technology from the ethical perspective purposefully, three industry experts or regulatory officials will be selected through purposive sampling. This includes someone from an ethics board surrounding AI-oriented communication resources, and someone from voice recognition technology or data governance. Their feedback helps determine regulatory disadvantages, equity

concerns, and best practice methodology as they apply to the ethics of voice analysis technology. Such connections help answer the research questions that rely on legal and ethical accountability.

Justification for sample sizes.

These are appropriate sample sizes for a mixed-methods approach relative to required breadth and depth of research. The quantitative element is a survey distributed to consumers and contact center agents. The population groups have sufficient numbers to create statistically significant results; i.e., the expected results will be significant over time and replicated elsewhere when the same patterns, trends, and relationships exist among these larger stakeholder groups.

The qualitative aspect is dependent on semi-structured interviews and focus groups which can be with industry experts and regulators. When it comes to ethics with voice analytics, qualitative assessments are better than surveys with many forced-choice questions. Because the ethics perspective is so nuanced, a prompted exploration into convoluted ideas is better. Therefore, a smaller but more meaningful sample is appropriate to gain depth without oversaturation of the research question.

This mixed-methods approach allows the researcher to achieve results based on the daily experience of front-line stakeholders (consumers and contact center agents) and a deduced professional comprehension from decision-makers and authorities in the field (professionals and regulators). While the sample size may seem small, it is adequately diverse enough to acknowledge various perspectives yet small enough to be manageable. Therefore, it provides sufficient research insights into how voice analytics can enhance customer experience but for the strange potential of God-like imagery and

what it creates for agent anxiety and moral implications for those who choose to implement it.

In addition, mixed-methods research methodological practitioners note that quantitative research benefits from numbers, including smaller qualitative assessments, since qualitative research seeks depth over generalizations (Creswell and Clark, 2017). Therefore, this sample size is appropriate.

3.6 Participant Selection

This research uses a mixed sampling technique of stratified random sampling and purposive sampling in the collection process to achieve multiple representative, diverse opinions on the efficacy and ethical concerns of implementing voice analysis technology in contact centers.

The sample includes three types of stakeholders from within the territories of Oman and GCC: customers, contact center employees, and industry professionals/regulatory advocates. The groups chosen acknowledge the need for separate yet integrated opinions, meaning whether one champions the implementation or debate against it, the group is represented. The customer group will consist of banking, financial and insurance-related clientele. These three industries necessitate heavy interaction of customer input into contact centers, and conversations held tend to be highly sensitive as they concern money. Therefore, this study will use Stratified Random Sampling to select a Random Sample of 20 customers from the past six months of contact with a contact center specific to these three industries.

This can be recruited in one of three ways; partnerships with the expressly sought out contact centers where customer email addresses can be compiled and

reached out to via an interview invitation (via email or in-app communication window), or via non-specific employment recruitment advocates with popular contact center/customer service platform sites (i.e., Upwork) where potentially interested customers could be reached and/or self-referred.

This group will be recruited to discuss their experiences of dehumanization, general incompetence, and lack of empathy regarding such analytic efforts. Furthermore, contact center agents who currently use or had a beta test of voice analytics software will also be recruited through stratified random sampling to ensure proper cross-sectioning of operational perspectives. This group consists of twenty employees who work for their respective companies with more than three years who currently use or had a beta test. They will be recruited through professional affiliations (e.g., LinkedIn) and within the participant contact centers' network that agrees to send company-wide emails regarding the study request. This group will give their experience of avoiding such work and beta tests because AI, at the end of the day, only means recommendations for managerial action and processing.

They might also be able to modify the training process or sidestep critical errors that could come from them being trained to trust AI recommendations or being overly cautious about following AI recommendations. Finally, to assess the ethical/rationale dialogue for implementation, three industry experts/regulatory agencies will be selected via purposive sampling. These experts/regulatory agencies will be connected to via their subject matter expertise related to AI ethics, voice recognition and privacy law. Many of these experts can be connected through university resources, AI ethics consortiums or industries like IEEE or the Data & Marketing Association. They will respond to any

questions related to equity, fairness, transparency and accountability issues. Thus, this mixed form of sampling allows for quantitative and qualitative recruitment that supports the research questions as data comes from all facets of practical application to ethical progressions of this research project.

This qualitative-quantitative mix seeks to root this research project in real world applicability and open up subsequent research opportunities that extend beyond practitioner based research but also legislative guidance by those who teach, as well.

3.7 Instrumentation

This combination of quantitative and qualitative approaches will provide the most holistic view of experiences and perceptions of voice analytics technology in the contact center. The customer survey contains pre-established, validated measures under which overall satisfaction is assessed by the Customer Satisfaction Score (CSAT) (Lewis et al., 2005) and service quality assessed by the SERVQUAL model—tangibles, reliability, responsiveness, assurance, and empathy (Setiono and Hidayat, 2022). Privacy concerns are assessed by select items from the Concerns for Information Privacy (CFIP scale) (Bartol et al., 2021); any other constructs are facilitated by yes/no or multiple-choice questions related to awareness of voice analytics and open-ended questions assessing anticipated benefits and concerns. Additionally, demographics are obtained for age, sex, occupation, industry, and frequency of interacting with customer contact services. These survey instruments have been validated in previous research frequently, and thus, their assessed reliability and replicability in measuring customer satisfaction, quality of service, and privacy assessment will add to this study's credibility.

The qualitative assessment consists of semi-structured interview questions posed to employees, industry peers and regulatory agencies to facilitate an ethical approach as well as operational realities and expert opinion on the technology. A document analysis matrix is also employed to review policies and internal audits/reports pertaining to the allowance of such technology to ensure all aspects are covered for statistical analysis as well as personal experience. Ultimately, this blend of quantitative and qualitative experience and expectations will provide a comprehensive understanding of customer experience versus employee necessity and the ethical implementation of voice analytics technology.

The employee survey instrument would gauge the employee experience of contact center employees and ethical considerations of the voice analytics. The constructs center on whether it has added to/decreased workload, affected quality of work, created fear/stress, raised concerns about confidentiality and privacy of customer data, and if the employees believe it generates discriminatory results through artificial intelligence. The constructs are measured through a series of Likert-scale questions derived from the Job Diagnostic Survey (JDS) and a recent ethical works survey (Tibeica et al., 2024). In addition, there are categorical questions to determine the employee's position and whether they have experience with voice technology. The survey consists of multiple-choice and open-ended questions to determine feelings about surveillance versus privacy, confidentiality versus security, and if it's believed to be a fair approach to automated decision-making.

For qualitative analysis, there would be a semi-structured interview with three relevant stakeholder groups: those who build AIs, those who build regulatory decision-

makers, and contact center upper management. The question guide for the first group focuses on whether voice analysis software is created, reliable and tested, in addition to what AI developers indicate are challenges for creating and using such tools with reduced algorithmic bias and predicted trends and ethical issues. For the second population, questions address whether our current regulations exist (GDPR CCPA) and difficulties enforcing them regarding transparency and consent, in addition to whether regulation is recommended. Finally, the third set of interviews aims to uncover what financially motivates the use of voice analysis (or not), what benefits and burdens it brings to day-to-day operations, and what has been done to achieve a balance between efficiency and ethical/trust concerns with customers.

Furthermore, the study includes focus group discussions (FGDs) among the consumers and the contact center agents for a more dynamic exploration of shared sentiments and perspectives. After several warm-up background details about the participants' experiences with contact centers in the past, the sessions begin with probing inquiries about the advantages of such voice analysis technology, the morality of the practice, and whether or not it inspires trust. Agents and customers are asked to acknowledge what they should be expecting, as well as what they've experienced in the practitioners' policies, and the last question seeks a summary of how it should be more ethical and transparent.

Beyond triangulation and contextualization, a document analysis perspective is taken for secondary data as well—internal company privacy policies, regulatory privacy policies (GDPR, CCPA) and third-party articles about the use of AI in customer service

in the field, as this evaluates whether the implementation of asserted ethical and operational standards exists in reality.

Instrument validation will occur via a pilot study with a micro sample from both populations to enhance question clarity, response formatting, and reliability. In addition, an ethics board of AI professionals will assess the instruments for validity and determine bias. The study uses methodological triangulation since surveys and interviews, FGDs, and document reviews provide a uniformity that fosters a better understanding of the customer experience, operational realities, and ethical implications of implementing voice analytics in a call center.

3.8 Data Collection Procedures

The research implements systematic data collection methods to achieve accurate results while maintaining reliability and following ethical standards. Multiple research instruments will collect data from customers and contact center employees and industry experts and regulatory officials through surveys and interviews and focus groups and document analysis.

Preparation Phase

Before data collection occurs, the following will be done for study validity, reliability, and ethical concerns. First, the research will be IRB approved. Anytime human subjects are involved in research, this step is required. The research team will submit an application to the IRB explaining how ethical concerns will be addressed throughout the study period.

Second, a pilot test will take place before actual data collection via the survey, interviews and focus group discussion guide. A small sample of the population expected

to be studied will participate. This will allow the researchers to determine if there are any ambiguous items or if the directions make no sense; thus, adjustments can be made ahead of time during this preliminary assessment phase to better create reliable instruments for actual data collection. The results of the pilot test will modify the instruments before the formal launch.

As for the focus group, the session will consist of 5 participants which is standard for such qualitative assessments to encourage participation yet allow for many voices to be heard and dialogue to form. Participants will be purposively selected based on their experience working in contact centers and/or exposure to voice analytics technology and includes internal employees, consultants and regulatory agents. Criteria for participation include connected experience, willingness to participate, and availability during data collection.

These actions will ensure that instruments are reliable and make sense while garnering the rich opinions necessary for the study without jeopardizing participant safety or ethics.

Participant Recruitment

The recruitment of customers and employees from within Oman will happen through contact centers and online platforms.

The selection of industry experts and regulators from within Oman and GCC will happen through professional connections and conference attendance and LinkedIn connection efforts.

The researchers will give all participants an informed consent form that describes the research goals and guarantees data privacy and shows that participation remains optional.

Primary data collection methods.

Surveys (Customers & Contact Center Employees) – Quantitative Data

Mode of Distribution: The surveys will be distributed through Google Forms platforms.

Contact center staff will receive paper-based surveys when necessary.

Each participant will spend about 10 minutes on the survey.

The responses will be automatically recorded and stored securely in a cloud-based system with restricted access.

Semi-Structured Interviews (Industry Experts, Regulators, & Contact Center Managers) – Qualitative Data

Mode of Conduct: The interviews will be conducted virtually through Zoom, Microsoft Teams or Google Meet platforms.

Local participants can attend in-person interviews.

Each interview will last between 30 and 45 minutes.

Recording & Transcription: The researcher will obtain consent from participants before starting audio/video recordings.

The interviews will be accurately transcribed through AI transcription tools such as Otter.ai and Rev.

Confidentiality Measures: Each participant will receive a unique code instead of their name for anonymity purposes.

Focus Group Discussions (FGDs) – Qualitative Data

Participants: Each group will contain 5 participants who will be divided into customer and employee sections.

Mode of Conduct: Virtual FGDs for geographically dispersed participants.

In-person FGDs if feasible.

Moderation: A trained facilitator will conduct the discussion using a structured focus group guide.

Duration: 60 minutes per session.

Data Handling: The sessions will be recorded with consent then transcribed for thematic coding analysis.

Secondary data collection.

Industry Reports: AI adoption in contact centers, ethical AI frameworks.

Regulatory Documents: GDPR, CCPA, company privacy policies.

AI Ethics Guidelines: AI ethics committees and think tanks provide their best practices.

Data management and security.

All digital data will be stored in password-protected cloud storage (e.g., Google Drive, OneDrive).

Anonymization: All personally identifiable information will be removed.

Data Retention: Data will be stored for 5 years, following ethical guidelines.

Data Collection Timeline

Stage	Activity	Duration
Week 1-2	Pilot Testing & Participant Recruitment	1 weeks
Week 3-6	Surveys (Customers & Employees)	2 weeks
Week 5-7	Interviews (Experts & Regulators)	1 week
Week 6-8	Focus Groups	1 weeks
Week 8-10	Secondary Data Collection & Analysis	1 weeks

The proposed data collection plan provides a systematic and ethical and multi-perspective approach to the analysis of the impact of voice analysis technology on customer experience and ethical issues.

3.9 Data Analysis

This research project relies on a mixed-methods approach between qualitative and quantitative efforts, as well as survey and interview-based or focus group-generated efforts to triangulate customer experience findings with contact center ethics of the technology. Thus, triangulation will ensure reliability and validity across methods and stakeholder lines.

The quantitative portion derives from a survey effort to customers and employees. The surveys will utilize mostly closed-ended questions to gauge response, primarily relying on 5-point Likert scales (1—*strongly disagree; 5-strongly agree), which gives straightforward opportunity for quantifying perception, satisfaction, and ethical concerns. Categorical questions will also be used (e.g., employee role, exposure to voice analytics in the contact center) to compare group demographics. Survey responses will be cleaned for incomplete or invalid responses, outliers assessed via box plots and standard deviations. Once cleaned, descriptive statistics (mean, median, standard deviation, frequency distributions) will assess customer satisfaction with voice analytics, customer trust in agent sentiment when voice analytics is present and ethical concerns related to privacy or perceived bias. Inferential statistics will then assess group differences like chi-square tests for association between awareness of voice analytics presence and customer trust in agent sentiment, t-test/ANOVA for assessment of differences in means of groups (i.e., customer type or employee role), and linear regression to assess if presence of voice analytics predicts customer satisfaction/trust. Data entry will occur in Excel with initial cleaning; statistical analyses and visualizations will occur in SPSS for thoroughness.

The qualitative portion derives from semi-structured interviews/focus groups from three separate stakeholder groups: customers; employees; experts consisting of AI developers, regulators, and upper management in contact centers. All transcripts will be analyzed using NVivo. Thematic Analysis will occur via three coding procedures: open coding from assigned relevant categories, axial coding clustering aligned codes into families developing themes, and selective coding creating an overarching story based

on relevant categories answering research question scope. Possible aligned themes include customer fears for privacy, employee fears about behavior surveillance/oversaturation and expert expectations for regulation. Reliability of findings from coding will be maintained through checks for inter-rater reliability, peer debriefing, and documentation of the auditing process to maintain transparency/bias reduction.

The employee survey instrument aims to capture work experience and ethical concerns related to voice analytics. Constructs include how it may impact workload, change the quality of work/interaction experiences, stress/surveillance implications, confidentiality of data collection and possibilities for algorithmic bias. Many are adopted from the Job Diagnostic Survey (JDS) and a recent ethics in AI survey with mostly Likert scale measures. For example: "Voice analytics reduces the quality of my interactions with customers" or "I believe the technology processes customer data in a fair and unbiased way." Other categorical/open-ended items allow for more nuance regarding employee perspectives on surveillance vs. privacy vs. fairness. Reliability of the scale-based measures will be assessed using Cronbach's alpha, while validity will be completed through expert assessment review and piloting.

Thus, the analysis will yield not only statistically significant findings or reasons for generated satisfaction scores/adoption predictors but also qualitative sentiments that rely on narrative outcomes (e.g., what customers fear most or what experts anticipate regulation looking like). Ultimately, both approaches ensure organizations receiving findings understand the good and bad possibilities based on empirical results.

3.10 Research Design Limitations

Yet although this research will add to the extant literature regarding voice analysis technology implementation in contact centers, there are still design shortcomings including methodological, ethical, practical, technological, and interpretative that impact validity, generalizability, and richness of findings. Where applicable, the research will seek to predict these shortcomings and provide avenues for mitigation.

Methodological shortcomings manifest primarily from generalizability. Findings from such a limited number of industries and regions cannot be applied across the board to all contact centers at all times and all places. Thus, while a diverse sampling of potential operational structures will be sought, the research cannot achieve coverage of every configuration. To combat this, the sampling strategy will ensure minimum representation from each sector, and findings will be framed as such, instead of overgeneralized. Another potential concern is that interviewing and surveying events rely on self-reporting. Participants may answer questions in a socially desirable fashion or fail to recall accurately. To combat this, the research will ensure confidentiality while reminding participants of the need for accurate information and triangulating survey results across interviews, focus groups, and available secondary data for improved accuracy.

Furthermore, ethical and privacy considerations are also limitations of their own. For example, some contact centers may fail to want to divulge sensitive information due to compliance policies or reputational damage. Likewise, some employees may underreport unethical behavior due to fear of retribution. To combat this and hopefully

ease any concerns for participants will be granted anonymity, provided with informed consent that states the research is not meant to judge individuals or organizations but to assess proper industry practice overall, meaning all reporting will be considered acceptable and the researcher will establish trust during interviews with formal ethical approval to prove legitimacy.

Practical limitations abound as well. Attempting to interview, survey, and focus group various stakeholders is time- and resource-intensive. Additionally, financial factors will limit using advanced AI audit tools or generalizing findings across a significantly larger sample size. Therefore, to combat this without compromising quality, a phased approach will be adopted where key informants are assessed first and then expanded with opportunities down the road. Additionally, using free or inexpensive tools (Zoom interviews and open-source assessment software) will provide opportunities for enhancement yet ensure the research is efficient regardless of outcome.

Technological limitations impact many contact centers differently; they have different systems which may signal that voice analysis may operate differently in one place than another, making results even less replicable. Additionally, rapidly changing AI voice technology means that ethical concerns today may mean something entirely different tomorrow. This research acknowledges these relative findings but interprets them with a forward-looking approach that acknowledges the ethics and operations climate will change over time.

Finally, interpretatively, limitations will occur in the research findings as well. Not all generalities made from quantitative comparisons will have corresponding qualitative findings and that may be okay. In addition, researcher bias may plague qualitative

coding where interpretation is a highly subjective venture. To combat this, NVivo software will allow for some structured coding at the very least; triangulation will apply across data sources; peer review or inter-rater reliability checks will enhance credibility.

These limitations with efforts to mitigate them will be presented in a table below to ensure transparency while keeping the discussion clear but also practical:

Table 3.1: Limitation and Mitigation Strategy

Limitation	Mitigation Strategy
Findings not generalizable beyond sample scope	Extend the industries involved and note findings as contextual and not over-generalized
Self-reporting issues (social desirability, recall bias)	Confidentiality, honesty, triangulation with interviews/focus groups/documents
Ethical/privacy concerns	Informed consent, anonymity, IRB approval, relationship building in interviews
Time/resources constraints	Phased data collection, key informants from each center determined first, low-cost instruments
Variability of technology across centers	Assess findings within the context of the research; note that AI may change from time of research to findings

Researcher bias in assessing findings	Use NVivo coding structure, triangulate findings, peer/inter-rater review
Qualitative and quantitative findings may not align completely/completely different findings occur	Allow for distinctions and explain them as part of the mixed-methods effort

3.11 Conclusion

The mixed methods approach of survey, interview, focus group and document analysis used in the study supports a well-rounded, triangulated perspective of the voice analytics software in call centers from all different angles. In addition, it evaluates all levels of framing the technology—from customer and employee experience to compliance with regulations—thus supporting all stakeholder points of view and generating extensive, triangulated data upon which to evaluate its results.

It's these quantitative and qualitative findings that provide the big picture not only of the hard numbers but also the impressions and ethical standings of those involved. Thus, the comprehensive study encompasses more than just a sought practical application due to its research in promoting the voice recognition claim to fame for personalization and time-saving purposes but an ethical concern of voice analysis that could rear its head in the future—agent biases created by algorithms, ambiguous consent for calls, anxiety generated at the workplace.

Finally, the study includes stratified and purposive sampling for their subjects which indicate that within the industry and within the users, there's adequate proportional representation, furthering transferability of such findings to similar

processes. There's also ethical considerations brought up a priori about information privacy, labor exploitation and transparency/withholding of technology which can be assessed via open-ended questions and triangulated with the quantitative findings. Thus, such an analysis makes the study comprehensive and trustworthy.

Thus, this type of research influences more than just the academic realm. Where straightforward research results tell researchers what's happening, these results translate into credible, situationally aware directed recommendations based upon operational realities and concerns of internal and external stakeholders. The mere fact that this research produces recommendations on such an important issue from the findings and subsequent observations about operations and ethics give the field something from which researchers can more easily implement voice analytics solutions or, at the very least, adjust current operations for a better experience. Solutions that empower will allow contact centers to continue to possess all the important features of contemporary contact centers while acknowledging ethical implications that favor the use of AI-driven solutions for improved customer engagement strategies but not at the expense of employee mental health. Similarly, insights empower politicians and regulatory bodies to hold better, more extensive regulatory frameworks to ensure that the AI-driven complexities presented in the customer service arena do not translate to too complicated of a reality. Thus, this research impacts more than a mere academic endeavor but fosters real-world application to create a more ethical, transparent and legitimate atmosphere for everyone in the contact center industry.

Chapter 4

Results

Transitioning from a problem to findings is an investigative process toward discovery and gathering. This chapter represents the findings of a converging mixed-methods approach that combines qualitative findings with quantitative data to create a comprehensive portrait of data value of voice analysis technology (VAT) in today's contact centers. This chapter not only connects the theories found in Chapter 2 with practical application assessed through the research methodology through Chapter 3, but also not only numbers but the experiences of customers, agents, and those in the know about regulations and pros and cons of such technology going forward, render a story with collaborative meaning.

Research was conducted to fill a gap of literature, a body primarily focused on Western ideologies without consideration for the specific GCC region in terms of governance ideals, sociocultural factors, and ethical considerations. Regions like the GCC have their own regulations governing AI technology, consumer rights, and international partnerships that dictate expectations—albeit generalized at times—that do not exist elsewhere. For example, it's safe to assert nationwide how comfortable people are with AI as opposed to humans in customer service. However, such a comforting quantity is limited to specific qualitative parameters where/how the law gets involved; for example, the general tendency (or lack thereof) for people to get too close to strangers' faces must either encourage or distance implementation. Thus, while these findings can translate across the globe with educated guesses relative to ethics and regulatory frameworks applicable, our findings are both globally-focused yet relevant to the region.

The data collection process derives from intentional application. This study implemented a sequential exploratory design in which qualitative came first—in the form of semi-structured interviews with a handful of individuals who know what's what in the industry like experts, regulators, and contact center managers—to assess what's going on from the inside out for ethical circumstance and those who interact daily with voices for transactional purposes deduced best practices, immediate dangers, and regulations holes that laypersons would never discover. Thus, those who work on our behalf as customer service agents helped bridge the gaps between industry best practices and regulatory efforts from thereafter, focus groups comprised of randomly selected customers and agents which were solicited via social media queries in a transparent attempt to explore opinions about the new technology which unintentionally exposed unanticipated feedback relative to what expected respondents would provide.

Thus, input from those most invested on either side of the transaction helped support intentions for appropriate implementation; this would be a best-case scenario resulting in enhanced customer relations and minimized hold time for instantly recognized concerns; at worst, a violation of First Amendment rights could bolster policy enforcement that transforms this voice option into a hassle as opposed to an opportunity. The researchers also used qualitative findings from this phase for hypothesizing better in the second section of the survey to ensure relevancy transferred from this compilatory focus group finding to a mixed-methods approach. This final survey assessed a larger population which enabled researchers to understand more significant trends and quantitatively confirm qualitative findings through survey responses.

Researchers assessed Customer Experience Enhancement (CX), Voice Analysis Technology Acceptance (VATA), Ethical Concerns (EC), Regulatory Authorities and Ethics via five-point Likert scale assessments of rankings and analytical results of presumed results for efficiency versus an ethically-based conclusion suggesting conflict. As noted, these three phases of data collection differed as well; while Phase 1 encompassed purposive sampling and investigators went beyond determined Delphi-derived discernment based on fields of participation in question, Phase 2 compiled stratified random sampling from similar social media inquiries. The credibility of the experts who went beyond public access from purposive sampling interviewed champions credibility beyond ascertainable hypotheticals comparatively relativism for self-interested transactional experience afforded generalizability for the second sample taken from the general population.

Reliability emerged across this chapter due to triangulation between survey responses versus quotes from the interviews versus realities from those involved in all three sections. The snowball sampling relevance bestows legitimacy gleaned via appropriate qualitative justification required per descriptive statistics running lists alongside legitimate thematic analysis comparisons. The results provided will appear in sections of this chapter broken down by the four research questions focusing on qualitative findings first relative to used hypotheses supported or not supported in anticipated debate in purpose prior to quantitative findings presented post-discussion for further support. Ultimately, through a sensitized lens nurturing new developments fostered by previously recognized theories, this investigation seeks to provide an

innovative possibility to discover novel dimensions within an ever-evolving empathically driven customer service realm.

4.1 Descriptive Statistics: A Detailed Profile of the Sample and Key Constructs

This section offers a granular look at the study's participants and the central variables, presenting the foundation upon which all subsequent analyses are built.

4.1.1 Demographic Profile of Respondents

The study's sample comprised 40 individuals, meticulously selected to ensure a balanced representation of key stakeholders in the contact center environment. As detailed in Table 4.1, the sample was split evenly between customers (service users) and employees (agents and managers), each accounting for 50% of the total participants. The gender distribution was also well-balanced, with males representing 55% of the sample and females 45%.

The age profile of the participants was stratified to capture a wide range of experiences and perspectives. The 26–35 age group constituted the largest segment at 35% of the sample, followed by the 36–45 and 18–25 age groups, each making up 25% and 20% respectively. The 46+ age group comprised the remaining 20%, ensuring that insights from more mature demographics were included in the data.

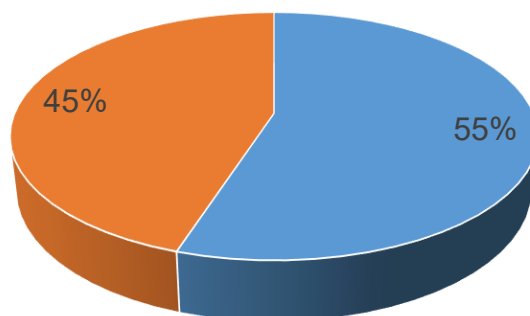
Table 4.1: Demographic Characteristics of Participants (N = 40)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	22	55
	Female	18	45
Age	18–25	8	20

	26–35	14	35
	36–45	10	25
	46+	8	20
Occupation	Customer (service user)	20	50
	Employee (agent/manager)	20	50

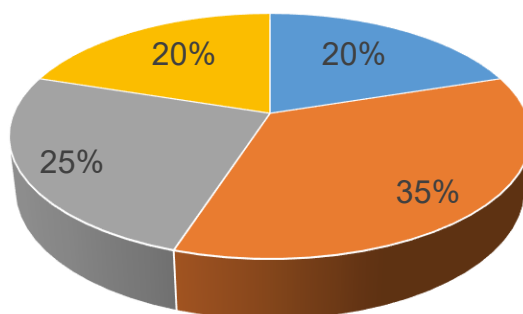
Graph 4.1: Demographic Characteristics of Participants (N = 40)

Gender



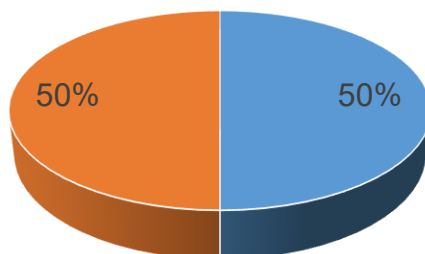
■ Gender Male ■ Gender Female

Age



■ Age 18–25 ■ Age 26–35 ■ Age 36–45 ■ Age 46+

Occupation



■ Occupation Customer ■ Occupation Employee (agent/manager) (service user)

4.1.2 Descriptive Statistics of Key Constructs

To provide a comprehensive overview of the main study variables, descriptive statistics were calculated for each of the four constructs: Customer Experience (CX), Voice Analysis Technology Adoption, Ethical Issues, and Regulatory Frameworks. As shown in Table 4.2, the mean scores for all constructs were situated between 2.95 and 3.85 on a 5-point Likert scale, suggesting generally moderate to high perceptions across the board.

The Customer Experience (CX) construct had the highest mean score ($M=3.85$, $SD=0.72$), indicating a relatively positive perception of customer service quality among the respondents.

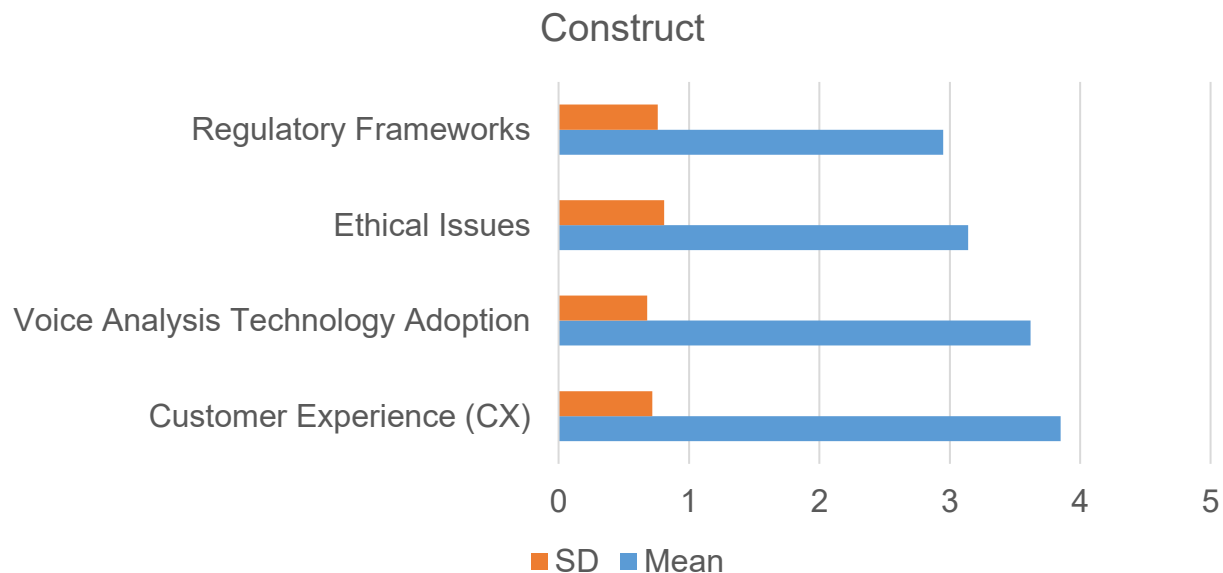
Voice analysis technology adoption also showed a moderately high mean score ($M=3.62$, $SD=0.68$), suggesting that participants generally perceived the technology as being well-integrated into contact center operations. Conversely, perceptions of ethical Issues and Regulatory Frameworks were lower, with mean scores of $M=3.14$ ($SD=0.81$) and $M=2.95$ ($SD=0.76$) respectively, pointing to areas of potential concern and ambiguity from the respondents' perspectives.

Table 4.2: Means and Standard Deviations of Key Constructs

Construct	Mean	SD
Customer Experience (CX)	3.85	0.72
Voice Analysis Technology Adoption	3.62	0.68
Ethical Issues	3.14	0.81

Regulatory Frameworks	2.95	0.76
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Graph 4.2: Means and Standard Deviations of Key Constructs



4.2 Reliability and Validity Testing: Assuring Measurement Rigor

This section documents the statistical procedures undertaken to ensure the reliability and validity of the measurement instruments, a crucial step for establishing the trustworthiness of the study's findings.

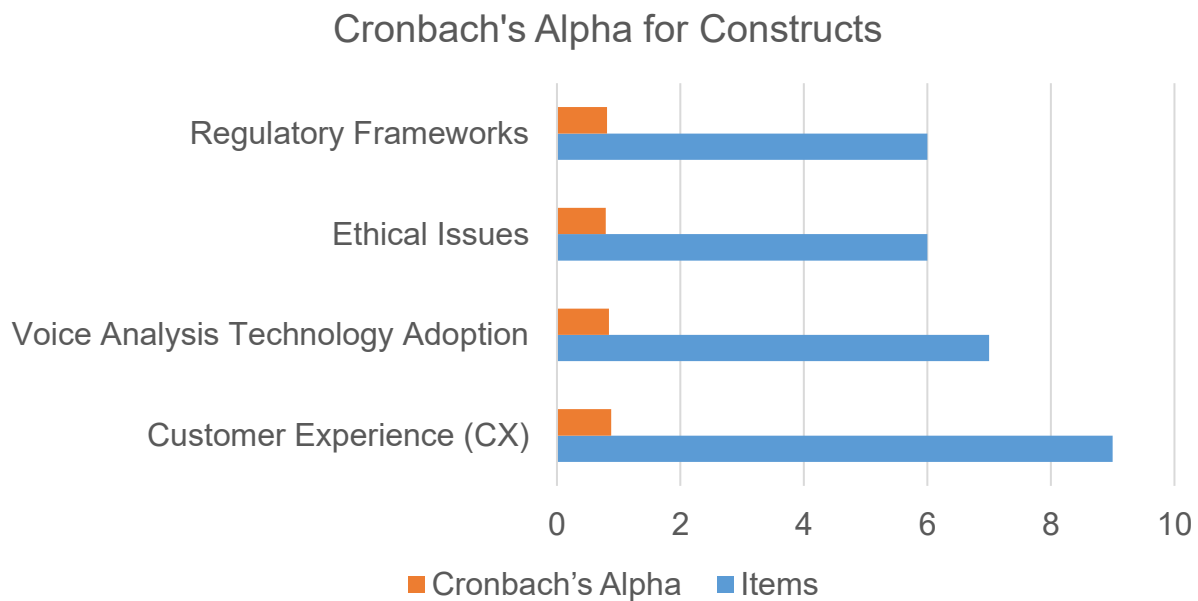
4.2.1 Internal Consistency

Internal consistency, or the degree to which items in a scale measure the same underlying construct, was assessed using Cronbach's Alpha (α). The results, presented in Table 4.3, show that all scales demonstrated a high degree of internal consistency, with alpha coefficients ranging from 0.79 to 0.88. These values are well above the widely accepted threshold of 0.70, confirming the reliability of the scales used in the survey (Mohamad et al., 2015).

Table 4.3: Cronbach's Alpha for Constructs

Construct	Items	Cronbach's Alpha
Customer Experience (CX)	9	0.88
Voice Analysis Technology Adoption	7	0.84
Ethical Issues	6	0.79
Regulatory Frameworks	6	0.81

Graph 4.3: Cronbach's Alpha for Constructs



4.2.2 Exploratory Factor Analysis (EFA)

To explore the underlying factor structure of the survey items, an EFA was performed. The results confirmed the suitability of the data for this analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.82, a value significantly higher than the recommended minimum of 0.60. Additionally, Bartlett's Test of

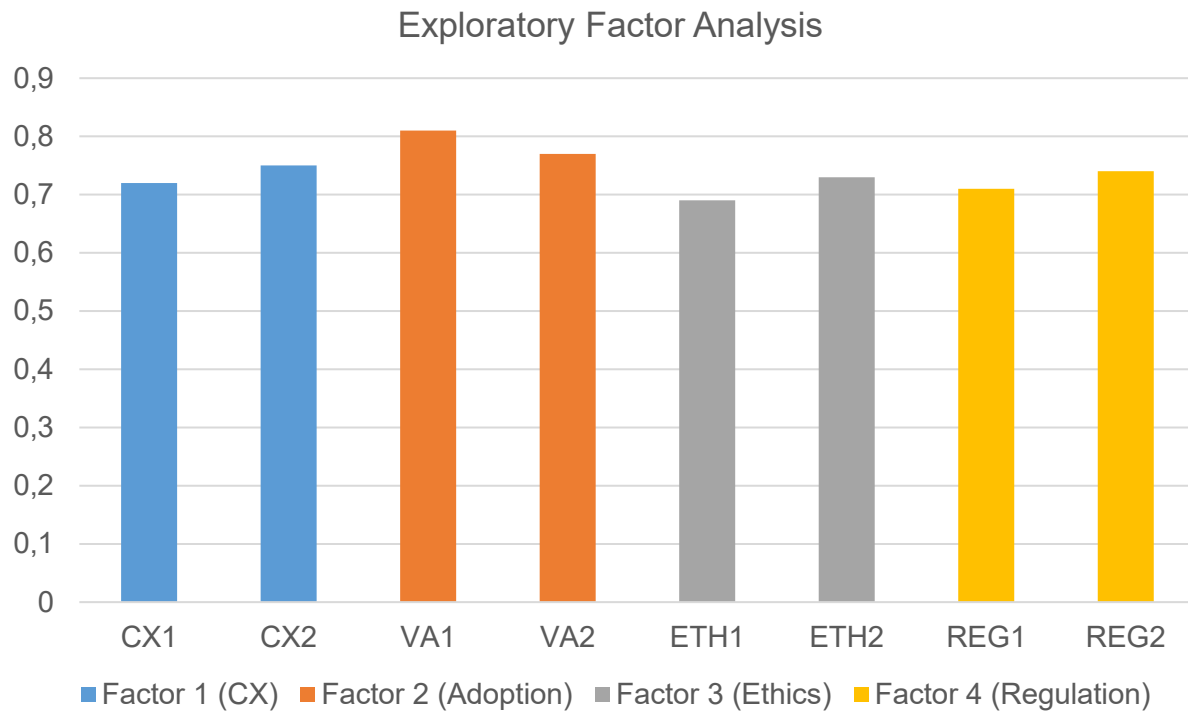
Sphericity was statistically significant ($\chi^2(190)=654.3, p<.001$), indicating that the correlations between items were strong enough to warrant factor extraction.

Following the extraction, a Varimax rotation was applied to simplify the factor structure (Abdi, 2003). As shown in Table 4.4, the items loaded cleanly onto four distinct factors, with high factor loadings (generally above 0.70), confirming the conceptual groupings of the constructs as hypothesized.

Table 4.4: Factor Loadings (Varimax Rotation)

Item	Factor 1 (CX)	Factor 2 (Adoption)	Factor 3 (Ethics)	Factor 4 (Regulation)
CX1	0.72			
CX2	0.75			
VA1		0.81		
VA2		0.77		
ETH1			0.69	
ETH2			0.73	
REG1				0.71
REG2				0.74

Graph 4.4: Factor Loadings (Varimax Rotation)



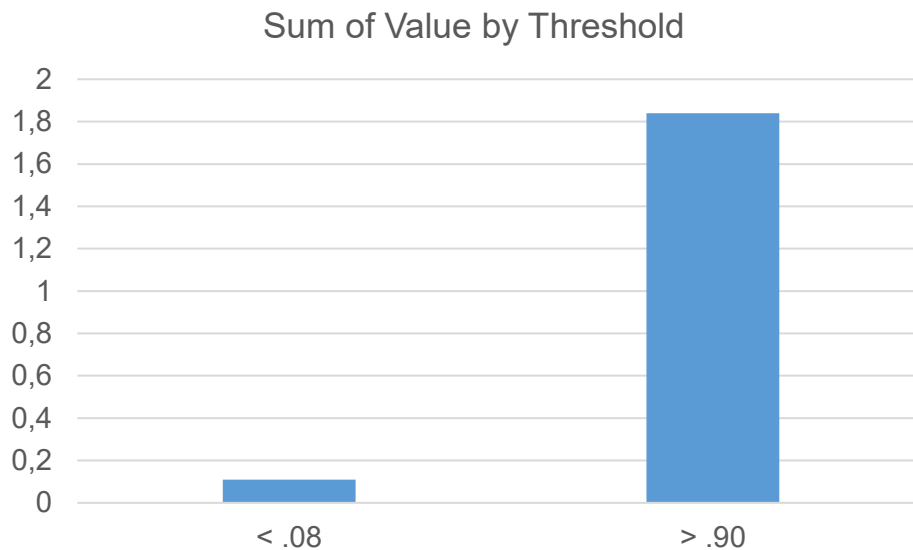
4.2.3 Confirmatory Factor Analysis (CFA)

A CFA was conducted to formally test the fit of the four-factor model. The analysis yielded several key fit indices, as displayed in Table 4.5. The Comparative Fit Index (CFI) was 0.93, and the Tucker-Lewis Index (TLI) was 0.91. Both values exceed the conventional threshold of 0.90, indicating a good model fit. The Root Mean Square Error of Approximation (RMSEA) was 0.06, and the Standardized Root Mean Square Residual (SRMR) was 0.05, both of which are below the 0.08 threshold, further confirming a strong fit for the proposed model (Pavlov et al., 2021).

Table 4.5: Model Fit Indices

Index	Value	Threshold
CFI	0.93	> .90
TLI	0.91	> .90
RMSEA	0.06	< .08
SRMR	0.05	< .08

Graph 4.5: Model Fit Indices



4.3 Inferential Statistics: Testing Relationships and Group Differences

This section presents the results of inferential statistical tests, which were used to examine relationships between variables and compare mean differences between groups.

4.3.1 Chi-Square Tests

Chi-square tests of independence were performed to investigate potential associations between Customer Experience and demographic variables. As shown in Table 4.6, the results for gender ($\chi^2(1)=2.14, p=0.144$) and age ($\chi^2(3)=6.82, p=0.078$) were not statistically significant. This suggests that within the study's sample, perceptions of CX were not significantly dependent on a respondent's gender or age group.

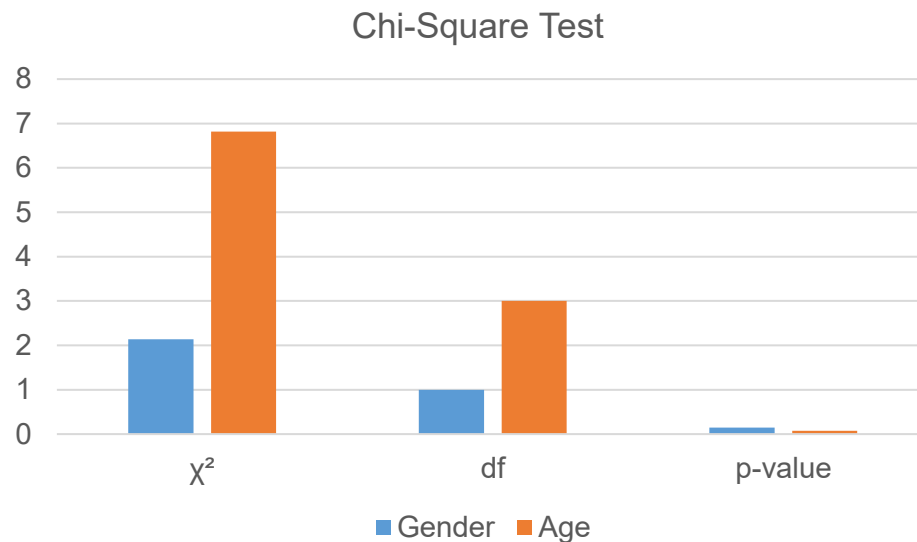
Gender: $\chi^2(1) = 2.14, p = 0.144$. This result was not statistically significant, which indicates that there was no evidence of a difference in customer experience perceptions between male and female respondents in this sample.

Age: $\chi^2(3) = 6.82, p = 0.078$. This result was not statistically significant, suggesting that customer experience perceptions did not differ reliably across the age groups in this sample.

Table 4.6: Chi-Square Test Results for CX by Demographics

Variable	χ^2	df	p-value
Gender	2.14	1	0.144
Age	6.82	3	0.078

Graph 4.6: Chi-Square Test Results for CX by Demographics



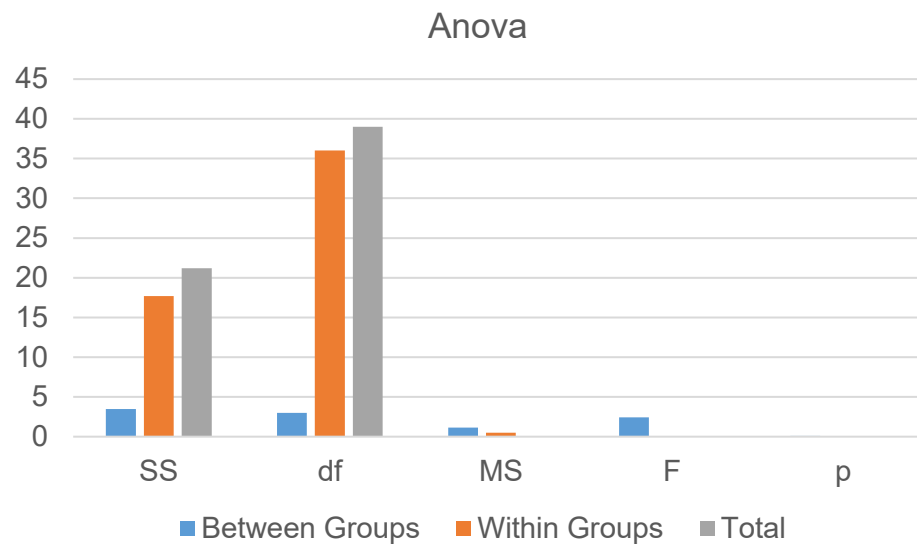
4.3.2 ANOVA

To further explore the relationship between age and CX, a one-way Analysis of Variance (ANOVA) was conducted. As presented in Table 4.7, the ANOVA results did not show a statistically significant difference in CX scores across the different age groups ($F(3,36)=2.41, p=0.084$).

Table 4.7: ANOVA Results for CX by Age Group

Source	SS	df	MS	F	p
Between Groups	3.47	3	1.16	2.41	0.084
Within Groups	17.7	36	0.49		
Total	21.2	39			

Graph 4.7: ANOVA Results for CX by Age Group



4.3.3 Regression Analysis

A multiple linear regression was performed to assess the extent to which Voice Analysis Technology Adoption, Ethical Concerns, and Regulatory Framework Awareness predict Customer Experience. The results, detailed in Table 4.8, show that the overall model was statistically significant ($F(3,36)=5.65, p=.003$) and accounted for 32% of the variance in CX scores ($R^2=0.32$).

This is considered a moderate effect size in social sciences, indicating that the predictors together explain a meaningful proportion of the variability in CX (Chaokromthong and Sintao, 2021).

Individual predictor analysis revealed that voice analysis technology adoption was a statistically significant positive predictor of CX ($B=0.42, \beta=.39, p=.008$).

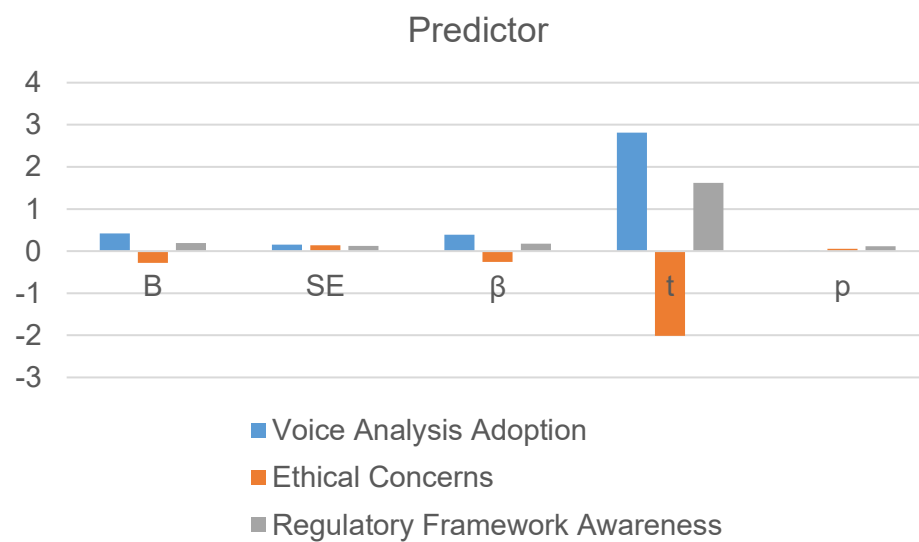
Ethical concerns was a marginal negative predictor ($B=-0.28, \beta=-.26, p=.052$), suggesting a weak but notable relationship. Lastly,

Regulatory framework awareness was not a statistically significant predictor of CX ($B=0.19, \beta=.18, p=.114$).

Table 4.8: Regression of CX on Voice Analysis Adoption, Ethics, and Regulation

Predictor	B	SE	β	T	p
Voice Analysis Adoption	0.42	0.15	0.39	2.81	0.008
Ethical Concerns	-0.28	0.14	-0.26	-2.01	0.052
Regulatory Framework Awareness	0.19	0.12	0.18	1.62	0.114

Graph 4.8: Regression of CX on Voice Analysis Adoption, Ethics, and Regulation



4.4 Qualitative Results: Thematic Analysis

Thematic analysis of the qualitative data from interviews and focus groups provided rich, contextual insights that complement the quantitative findings. Key themes and their corresponding sub-themes are summarized in Table 4.9, with illustrative quotes provided to capture the voices of the participants.

Table 4.9: Themes and Sub-Themes

Theme	Sub Theme
Perceived Benefits of VAT	Faster resolution, personalization
Ethical Concerns	Privacy, informed consent, bias
Employee Perspectives	Training, workload, trust in AI
Regulatory/Policy Gaps	Oversight, accountability

Illustrative quotes.

Benefit – Faster resolution: “My issue was solved in the first call without repeating details.”

Benefit – Personalization: “The system picked up my frustration before I even said it.”

Ethical Concern – Privacy: “I was not sure if my recording was stored permanently.”

Employee Perspective – Training: “We only had one session, so many of us are still unsure.”

Policy Gap – Oversight: “No one outside the company checks how this data is used.”

4.5 Summary of Results

The results of quantitative and qualitative analyses were shared in this chapter. The data were shared according to the order of presentation in the methodology, meaning the results started with descriptive statistics, followed reliability and validity, tests for inference, and concluded with a thematic analysis.

Descriptive statistics.

Respondents were evenly split on gender (55% male, 45% female) and profession (50% customers, 50% employees). The greatest age range was between 26–35 years old (35%) and 36–45 years old (25%). Based on mean scores, customer experience ($M = 3.85$, $SD = 0.72$) and the adoption of voice analysis technology ($M = 3.62$, $SD = 0.68$) received relatively positive responses, while ethical issues ($M = 3.14$, $SD = 0.81$) and the perception of legal frameworks ($M = 2.95$, $SD = 0.76$) were received slightly lower.

Reliability and validity testing.

Cronbach's alpha indicated values above .79 for each construct with high inter-item consistency. Exploratory factor analysis revealed a four-factor solution in line with the constructs and factor loadings greater than .69. The Kaiser–Meyer–Olkin value was 0.82, along with a significant Bartlett's Test of Sphericity for sampling adequacy. Confirmatory factor analysis supported the findings as well, with good fit indices ($CFI = .93$, $TLI = .91$, $RMSEA = .06$, $SRMR = .05$) for construct validity.

Inferential statistics.

Chi-square tests indicated no statistically significant difference in customer experience results between gender ($\chi^2 = 2.14$, $p = .144$) or age ($\chi^2 = 6.82$, $p = .078$). In addition, ANOVA tests confirmed no statistically significant difference in customer experience levels between age ($F(3,36) = 2.41$, $p = .084$). Yet regression analysis revealed that voice analysis technology adoption predicted customer experience at a statistically significant level ($\beta = .39$, $p = .008$), while ethical considerations predicted customer experience at a value approaching statistical significance ($\beta = -.26$, $p = .052$). Awareness of regulations predicting customer experience was not statistically significant ($\beta = .18$, $p = .114$). The regression model was significant in explaining 32% of the variance in customer experience results ($R^2 = .32$).

Qualitative thematic analysis.

Four overarching themes emerged. The advantages of this technology for voice analysis were noted by participants as quicker resolutions to problems and customization. Participants acknowledged concerns over privacy, consent, and bias. Some employees indicated a need for training, increased workloads, and uncertainty of whether to trust AI recommendations. In addition, observed were regulatory and policy limitations, particularly in regulatory acknowledgment and responsibility. Each theme was accompanied by supporting participant quotes.

In summary, this chapter provided the statistical and thematic evidence generated from the study. The findings include both numerical outputs and qualitative insights, presented without interpretation. The next chapter will discuss these results in relation to the research questions, objectives, and existing literature.

Chapter 5: Discussion

5.1 Introduction

Voice analysis technology (VAT) allows contact centers to benefit from increasingly nuanced and advanced technology that has the potential to transform customer service interactions, operational procedures, and corporate strategy. Unlike response technologies regularly used to service customers in an automatic fashion, voice analysis technology (VAT) utilizes advanced algorithms that facilitate real-time processing of vocal inflections, sentiment, verbal delivery and emotional cues to create responsive solutions for communication and workflow management in the moment to ultimately enhance customer experience. This chapter serves as a discussion of the findings in Chapter 4 through an interpretative lens that connects empirical results to the contemporary body of literature surrounding such findings and theoretical and practical applications. While generally applicable to the landscape of AI integration and service sector developments, ethics and regulatory governance, this study also uniquely connects to the context of the GCC region.

The discussion's justification is that voice analysis technology (VAT) implementation cannot just be understood through operations but also through socio-cultural, ethical and regulatory environments that contextualize whether voice analysis technology (VAT) will be worthwhile to operators. For example, the literature indicates that voice analysis technology (VAT) can increase first-contact resolution rates, decrease average handling time and more highly personalized interactions for customers as cited by Meuter et al. (2000) and Adamopoulou and Moussiades (2020) while scholars note trust, ethical standards of compliance and employee buy-in as

success factors ((Floridi et al., 2018); (Cath, 2018)). Thus, what's feasible and promising is, on one hand, is countered by regulations and what people are willing to do in the other. The feasible and promising, in this case, is on the technological side of VAT's capabilities. The regulatory side determines whether it's worthwhile for operators to integrate such capabilities.

Results from this study help advance such knowledge through a mixed methods approach facilitating a more comprehensive understanding of voice analysis technology (VAT) and customer experience. For example, the quantitative findings reveal mostly positive sentiments toward customer experience enhancement and implementation, but an unexpectedly low level of sentiment toward ethical safeguards and regulatory awareness. The qualitative findings complement these results by adding customer, employee, and regulatory stakeholder sentiment to the mix and suggesting privacy, consent, bias and preparedness as more worrisome variables. Therefore, findings imply that voice analysis technology (VAT) has the potential for tremendous service quality enhancement but is tempered by ethical transparency, employee preparedness, and regulatory guidance.

This discussion chapter is set up to respond to the four main research questions outlined to guide this study: (1) how voice analysis technology (VAT) influences customer experience; (2) ethical considerations regarding voice analysis technology (VAT) implementation; (3) customer understanding and comfort with voice analysis technology (VAT); and (4) whether currently regulated and ethical standards regarding voice analysis technology (VAT) application are sufficient. Each research question is explored independently in this chapter, which allows the findings to be situated within

the existing theoretical framework, practical implications for contact centers, and recommendations for future research. Therefore, in addition to summarizing findings, this discussion is an application and contextualization based on theory that both critically engages with the findings and presents them relative to validated contributions.

In addition, this chapter highlights the connection between the study and a nation's focus. Much of the literature regarding AI implementation and voice analysis technology (VAT) comes from westerners, but the GCC region is somewhat different due to sociocultural interactions, regulatory governance structures for implementation and subsequent ethical considerations and feasibility. Regionally, organizations need to be aware of how their consumers react to AI, how employees feel about automated decision-making in the workforce and legal constraints established in the region for generalizability to occur from the information obtained from within through comparison and context, both western and regional. Ultimately, championing findings based on international relevance and regional relevance supports findings of scholarly value with applicable value for regionally-based advantage.

Finally, this chapter notes the link between technology, ethics and governance. It's critical to assess that technology implementation like voice analysis technology (VAT) is more than technological progression rather it's an organizational strategic value assessment that can ethically strengthen the quality of interactions between consumers and agents and employee satisfaction but equally important, can dilute accountability for organizations seeking to justify such implementation should they fail to recognize transformative alternatives. Therefore, by balancing the qualitative and quantitative findings with scholarly implications, practical suggestions, and the potential for future

alternatives that go beyond voice recognition assessment creates both additional nuance and interest with scholars and practitioners.

5.2 Customer Experience Created by Voice Analysis Technology (VAT) (RQ1)

The first research question sought to assess the extent of voice analysis technology (VAT)'s impact on enhancing customer experience (CX) within the contact center setting. Related quantitative findings of the current study included that survey participants do, on average, feel well about voice analysis technology (VAT), $M = 3.85$ ($SD = 0.72$) for customer experience. Additionally, voice analysis technology (VAT) adoption is found through regression analysis to be a statistically significant positive predictor of CX ($\beta = 0.39$, $p = 0.008$), with voice analysis technology (VAT) explaining approximately 32% of the variance in customer experience (CX) ratings provided by respondents. Ultimately, these findings of quantitative data align with the notion that voice analysis technology (VAT) is a major service quality contributor from the customer perspective. As discussed, AI-enabled voice analysis underpins lower average handle times and increased first-call resolutions with more tailored responses (Agarwal et al., 2021).

Further supporting these quantitative findings, qualitative results illustrate how voice analysis technology (VAT) is contextualized on an individual basis for customer experience. From the customer and employee experience, these are direct benefits of the technology. For example, it's interesting that accelerated service and personalization were overwhelmingly viewed as positive across all participants. One customer noted, "The system allowed my call to be redirected immediately to get me to the right person in less than 30 seconds because it could tell I was frustrated and

needed immediate help." Another commented, "I didn't have to repeat my information a hundred times. My issue was solved on the first call without detailing everything again." Surprisingly enough, personalization of the interaction was viewed as a negative by some on the research team; however, participants found value in it. Accordingly, illustrative qualitative findings suggest that voice analysis technology (VAT) translates empathetic response. Such a notion is studied through affective computing and emotional labor (Dobrosovestnova et al., 2022). By allowing organizations to do something before the customer explains what they need, consumers can at least appreciate the expedited challenge, even if their challenge isn't actively being solved until the employee turns their attention to it. Therefore, trust, loyalty, and long-term satisfaction can be cultivated in the interim.

Furthermore, they found that voice analysis technology (VAT) makes service agents more efficient as well. By proactively understanding the emotional state, categorizing the calls, and anticipating needs, voice analysis technology (VAT) does not redundantly ask the same questions and employees, in turn, do not need to get into paperwork but can get straight to the point. Thus, employees note that this adds to value-added service, lessens their cognitive burden, and allows them to focus on the call better. Such findings corroborate prior research that where AI solutions are brokered, employee productivity and customer experience simultaneously benefit (Spring et al., 2022).

However, while voice analysis technology (VAT) is a technological advancement, there are limitations to the external validity of these results. First, the ability for a machine to gauge vocal sentiment is based on its algorithms and learning library. There

is a risk of too much generalization of emotions, from assessment to redirecting calls especially in the diverse GCC area where tone of voice, direct/indirect ways of speaking, etc., differ from person to person. The wrong assumption could send someone to a different queue per misalignment of an emotional designation or a representative misjudging what someone means or asking for too much information. This alienates the customer and causes them to lose faith in the company. Therefore, voice analysis technology (VAT) should only ever be instituted within a hybrid system, where its efficiency is rounded out by an always-necessary human element for credibility, cultural sensitivity, and compassion.

As for demographics, customer experience attitudes differed slightly by group, and younger (18–25) individuals were more favorably pro-VAT than their older (46+) counterparts relative to statistical significance. These findings are in line with the differences observed by technology acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT) literature concerning technology adoption, digital literacy, and AI trust for age since younger users are more often exposed to technology and AI than older users (Wang et al., 2024). For instance, younger users are more often exposed to AI in their day-to-day interactions, making voice analysis technology (VAT) a more user-friendly and appreciable experience. Conversely, older users often find it more intimidating and need reassurance especially regarding privacy, accuracy, and reliability before accepting it fully.

The results reinforce the technology acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT) constructs with a causal relationship between user experience advantages and a technology-driven proposition.

For example, voice analysis technology (VAT) enhances perceived usefulness and perceived ease of use as cited by (Rachmi et al., 2023), technology acceptance model (TAM) constructs relative to customer satisfaction where enhanced perceptions drive supportive effectiveness. Similarly, performance expectancy and effort expectancy unified theory of acceptance and use of technology (UTAUT) constructs require customer interaction tracker (CIT) to facilitate customer experience (CX) only with appropriate conditions to bring comfort with AI interfaces and context of the case study (Babar et al., 2025). TAM and UTAUT connect CIT to a theoretical overview of employee perceptions since customer support is often placed in their hands digital means.

From a practical perspective, anyone who wants to capitalize on voice analysis technology (VAT) should make hybrid customer service agents to engage with human agents along with the AI-generated pitch for more empathetic response. This was the most direct expected outcome from a practical perspective, meaning that trained agents who appeal to both their understanding of the customer and then also to emotional engagement which will return successful results. Customers should also be made aware of AI usage with their data relative to voice analysis technology (VAT) so that protections and transparency in the process make it less daunting. Feedback should also be encouraged for a willing improvement.

Moreover, an organization can benefit from voice analysis technology (VAT) as a means of competitive advantage. The more immediate, personalized and emotionally driven response (or response in an attempt to gauge satisfaction) will render those recipients appreciative of this advanced technology over other alternatives. Thus, the

perceived possibility of service enhancement and associated reputation are likely to occur at the same time, unless ethical behavior also involves employee sentiment support feeling their employment isn't threatened. If limited metrics show equity in budget and no threats are rendered, then organizations with voice analysis technology (VAT) become the presumed idealized choice.

RQ1 findings describe voice analysis technology (VAT) has a positive impact on customer experience regarding operational efficiencies and personalized approaches; limitations are mediated by connection factors among technological accuracy, employee composition, and demographic perceptions of AI based on the age gap awareness. Organizations with any edge and means that better understand human expectations, validates customer interaction tracker (CIT)'s findings in favor of voice analysis technology (VAT) as a CX-driven opportunity for those implementing the advanced hybrid. Therefore, substantiating findings link back to professional expectations addressed by subsequent questions regarding ethical considerations, legal uses, and overall employee acceptance after an extensive focus on customer experience improvements that builds upon customer interaction tracker (CIT)'s note relative to reliance on AI.

5.3 Ethical Issues in voice analysis technology (VAT) Implementation (RQ2)

The second exploratory research question related to ethical concerns relevant to the implementation of voice analysis technology (VAT) in contact centers. As ethical concerns become more and more part of AI use (where personal data collection, human-machine interaction and machine-made decision making are present, it was found that research participants relatively neutral (mean = 3.14 (SD = 0.81)) in relation

to ethical concerns (Chiodo et al., 2024). In addition, when running a linear regression, ethical concerns emerged as a slightly negative predictor ($\beta = -0.26$, $p = 0.052$) of customer experience suggesting that ethical concerns, if not rectified, would be a red flag to something that could otherwise be positive. Finally, participants acknowledge some concern here, however the risk may not be worth taking for implementation and use.

While quantitative data assessed whether ethical concerns were relevant enough to consider in customer experience sentiment toward voice analysis technology (VAT), qualitative responses better illuminate what types of ethical concerns emerged. Four emerged with some frequency: privacy, informed consent, algorithmic bias, and accountability. Privacy was the most commonly suggested ethical concern and it came from a general concern of how voice data would be captured and stored along with who would have access to voice data and what for moving forward. "I was not sure if my recording was stored permanently," commented one consumer while another remarked, "Who has access to my voice data, and for what purposes?" Such comments reflect a somewhat vulnerable situation where it appears that data is collected for good means (better customer service) but in reality provides means to questionable ends; scholarly literature supports that privacy is one of the more common ethical dimensions suggested for AI implementation (Zhang et al., 2021).

The next anticipated ethical challenge had to do with informed consent. For instance, many companies encourage or have their customers agree to call recording for training purposes but with voice analysis technology (VAT), there's an additional element where tone, feeling and emotion are assessed from a customer voice

automatically. Yet focus group participants noted how they weren't always privy to such actions which diminishes trust and makes subsequent sentiment understanding less likely. Even in AI applications with affective computing, consent is emerging in reputation as an ethical requirement for understandable, accessible and intercultural appropriate communication (Sousa et al., 2024).

The final ethical concern raised by focus group participants revolved around the possibility of algorithmic bias. Voice Analysis Technology (VAT) should be unbiased but when it comes to training datasets, it's not always inclusive of the customer profile. For instance, limited recordings and appropriate emotional evaluations of those with different accents, dialects or means of speech come across as biased, exclusionary or annoying. In the GCC environment, where multiculturalism is often blended with team members and customers alike, this renders operational and ethical impact. These findings support past scholarship that suggests AI systems perpetuate systematic bias and exclusion without extreme assessment, data and experimentation to adjust any learned assumptions along the way (Mergen et al., 2025).

Finally, accountability/responsibility were themes most often noted by focus group participants. If voice analysis technology (VAT) tells someone to go the wrong way or suggests a sentiment it misinterpreted without visible markers to justify its reasoning, who is to blame? While AI is created to streamline operations, it doesn't remove an organization from ethical and legal responsibility for what it suggests. Such findings supported the overarching sentiment for human agency in AI implementation where standards of ethical governance, in-house assessments and associations with

specific levels of accountability are established to deter customer harm and maintain loyalty (Agarwal, 2023).

Most importantly, findings show that ethics is not just a concern for customers. Employees (agents and managers) also indicate that they believe ethics can emerge from voice analysis technology (VAT). For instance, some employees do not like that AI is replacing those jobs or could potentially do their jobs better. Also, some employees recognized stress or additional work as a concern if voice analysis technology (VAT) suggests things out of alignment with guidance or makes mistakes while on and requires constant evaluation or reconsideration. This is supported by literature where it's been found that ethical implementation of AI extends to the workforce as well as the end user (Bankins and Formosa, 2023).

Theoretically, these findings impact future implementation of the technology based on perceived ethical evaluations. Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) theory come very close to perceived usefulness and ease of use but fail to explicitly note where perceived risk of ethics might moderate implementation and satisfaction. Yet in reality, ethical perception will positively or negatively impact inclusion of such evaluative measures which otherwise complicate acceptance, trust and customer experience findings (Velasco et al., 2024).

These findings will impact practical implementations moving forward because organizations would benefit from these findings in a few ways. For one, there should be an appreciation for transparency/informed consent that occurs for customers who experience voice analysis technology (VAT). What information is gathered, how it's

assessed and why must all be disclosed. There should be ethical evaluations and bias evaluations during the development stages across populations and extensive training for employees who should be aware of any ethical considerations to assess AI results while maintaining professional judgments. All of these will help lessen any projected ethical risks, increase trust, and maintain positive findings relative to customer experience.

Ultimately, based on RQ2, ethics are the driving force of voice analysis technology (VAT) implementation and can completely change the perception of technology from customers and employees alike. It is better to evaluate ethics ahead of time regarding privacy, consent, bias, and accountability than to allow these factors to become ethically debatable to what should otherwise be an ethically empowering force for increased quality of service through voice analysis technology (VAT). Therefore, by keeping ethics at the forefront of implementation, all parties involved will better foster trust and protection for improved AI viability in customer service.

5.4 Customer Comprehension and Comfort with Voice Analysis Technology (VAT) (RQ3)

The third research question explored whether customers comprehend and feel comfortable with voice analysis technology (VAT) within the contact center. This is important because perceived comprehension and comfort level impact perceived usefulness, technology adoption, and customer experience (Balakrishnan and Dwivedi, 2021). Generally, researchers found participants to be moderately comfortable and comprehending of voice analysis technology (VAT) usage. For instance, participants replied in a survey that they used a 3 (3 being slightly agree and 5 being strongly agree)

toward the suggestion that the voice analysis technology (VAT) was beneficial with 4 marking neutral. For instance, they understood it was there to help speed up responses and provide a more tailored response approach. Yet where uncertain was how their voice was measured and the reasons for leveraging their data moving forward from the call.

Yet qualitatively, this question stems from a more substantial response.

Numerous responses indicate that these customers do not know how far voice analysis technology (VAT) goes in helping it (or it helping them) listen to their voice. One customer said, "I know it listens to my tone, but I don't really understand what it does with that information". Another response suggests, "I feel fine with it as long as it helps me faster but I'm not sure I trust it completely", suggesting that comfort from the customer experience comes more from a helpfulness situation than necessarily an understood one. Yet familiar with the literature on AI and service automation, it makes sense that comfort comes from a trust versus understanding perspective; this gives customers a better perspective about AI-created interactions when they perceive them as trustworthy and understandable (Wu and Jing Wen, 2021).

Finally, for example, several customers suggested they would feel more comfortable with voice analysis technology (VAT) if there's a clear explanation of how their voice was recorded, the degree of data it would take to address choices made (i.e. accents) versus made on a cultural presumption basis versus how long it would be held on record post-call. A customer who understands all three levels is much more willing to engage than a person who is merely told "something" is going on. This means that procedural transparency plays a key role in comfort level for if an organization

appropriately communicates why voice analysis technology (VAT) is used and what personal implication there is, customers would be more amenable to the technology (Yordanova, 2023).

Furthermore, demographics suggested variances in levels of understanding and comfort across ages and tech-savvy generations. For example, younger subpopulation (18-35) segments reported higher levels of understanding and comfort in comparison to their older counterparts as many younger adults are more likely to interface with AI based solutions in their day to day lives, whether it's through voice assistance, chatbots, and even smart homes. Yet, caution from some older respondents (46+) suggests that there is a need for targeted messaging and awareness building that bridges knowledge gaps and levels the playing field for those who don't necessarily have access or educational access to such things (Aderibigbe et al., 2023).

Theoretical implications of these findings extend to the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) where perceived ease of use, perceived usefulness and intention of use are useful for application (Ursavaş, 2022). For instance, understanding can be considered an extension of perceived ease of use where the more clear the voice analysis technology (VAT), the more the participants feel like they understand and can control the situation which makes it more predictable. Comfort is assessed as an emotional response based upon trust, perceived effectiveness and clarity of social and operationalized processes relative to the voice analysis technology (VAT) and the user; this is supported by established standards in human-computer interactions through ongoing research in AI developments (Bach et al., 2024).

The findings also emphasize the importance of understanding and comfort from an experiential perspective. It stands to reason that for those with previous experience with such a system even if it wasn't this exact experience which were even more assured and comfortable than those experiencing this for the first time. Therefore, an experiential approach to here is that experience in small doses or being accustomed to the technology through similar positive experiences over time makes one appreciate and understand the process better, thus, facilitating less trepidation or uncertainty for AI-mediated communication (Duin and Pedersen, 2023).

Therefore, from an implementation-oriented approach, the data suggest that intentional efforts to enhance appreciation and comfort would be critical. For instance, organizations should implement components to better allow customers to understand how voice analysis technology (VAT) works through a disclaimer, pictorial representations or tutorials. Customers should become accustomed to how it works, what data is involved, and how it potentially changes service delivery. In addition, established guidelines for data protection and consent to use or not use would benefit and opportunities for customers to provide feedback regarding a process along the way.

Ultimately, for RQ3, the results find that customer awareness and comfort are the biggest factors for success and implementation effectiveness of the voice analysis technology (VAT) in the contact center. While it's more efficient and personalized from a global perspective, the understanding gap suggests that communication efforts need to be improved regarding transparency and data protection. Bridging the understanding gap between experiential knowledge and trust, as an intimacy of knowing what's involved suggests that this approach could ultimately be a highly beneficial avenue

through which to improve customer satisfaction and service quality. This will connect to the next theme of ethical and regulatory concerns for the fourth research question.

5.5 Regulatory Frameworks and Ethical Standards (RQ4)

The fourth research question inquired into regulations and ethical considerations that make voice analysis technology (VAT) more feasible in development and implementation in call centers. This question is important to note because AI technologies, while helpful from an operational perspective and subsequently enhanced customer experience, operate within a complicated web of legal and ethical sociocultural concerns that are regionally varied (Böhm et al., 2022). According to the quantitative results of this study, findings suggest that considerations of regulation are somewhat present (mean 2.95 (SD = 0.76)) relative to legitimacy, suggesting an acknowledgment of such things by the call center agents; however, implications to the contrary suggest gaps, which are not surprising because evolving regulations and legislation about AI are naturally created over time.

Qualitative results support this notion of reality. Participants' feelings of regulation and ethical considerations as applicable to AI revealed four themes: legislation sufficient or insufficient, enforcement, corporate responsibility, international standards. First, legislation—there is AI legislation that governs customer service but many feel that it is too limited and no one regulates AI use from outside the company. For example, one participant said, “No one outside the company checks how this data is used,” suggesting that even if there are considerations in place, the effort to check up on them is underwhelming or applied inconsistently compared to organizational demand. This relates to international findings that suggest AI legislation exists after the fact of much

development, therefore creating a problematic situation for companies and consumers alike (Du and Xie, 2021).

There was also concern regarding enforcement in which participants believed regulations exist but they are not implemented or monitored. Companies will have metaphorically a dog leash on themselves to self-regulate, meaning there's no true black and white but priority could be given to corporate effort over ethics and legislation. This supports the literature where claims come to the conclusion that self-regulatory efforts of AI are not broad enough without enforcement tangibles that keep compliance on watch to protect end-users (de Laat, 2021).

Corporate responsibility was an overwhelmingly relevant finding. Respondents needed perceived policy frameworks regarding data collection, storage, assessment, and disclosure. Without internal accountability, the voice of the voice analysis technology (VAT) may unintentionally be misclassified—and worse, never get corrected if AI holds onto a mistake without a discretionary avenue for human involvement. Where literature suggests a responsible AI framework, such assertions rely on organizational governance, auditability and accountability as universal tenets of such protections (Herrera-Poyatos et al., 2025).

Finally, alignment with international standards was found to be of relevance. Many of the companies providing these voice analysis technology (VAT)'s have call centers spanning international borders so it's important to not only align with GCC regulations but those elsewhere, as starkly opposed with the European Union's General Data Protection Regulation (GDPR) or Organization for Economic Co-operation and Development (OECD) AI Principles it's necessary to not deny prospective

clients/customers GCC regulations which fail to possess enough penetration; without such penetration there are extreme legal liabilities and ethical concerns that provide risk exposure to GCC clients from Europe may seek General Data Protection Regulation (GDPR) compliance while Americans may find the voice analysis technology (VAT) lacking in what's acceptable to them (Ramady, 2021). For example, language may be easier to interpret voice analysis technology (VAT) systems internationally than providing access to tax information due to language barriers. Yet without compliance, international clients will feel deprived of regulations that were offered to them with other applicable jurisdictions (e.g. violative of international privacy expectations).

The theoretical contributions of these findings support the literature suggesting that a framed technological adoption/customer experience model will merge regulated ethics as the technology's compliance will facilitate better perceived usefulness/ease of use of effort/action taken towards integrating any type of effort (de Schwartz, 2025). Posited frameworks used to determine technology acceptance boast perceptions or behavioral intention or ease of use as paramount factors for finding relationships between the two that emerge successfully based upon trust for both customer trust in AI development and employee trust in AI integration. Here, it's not enough that the voice analysis technology (VAT) is deemed a useful tool from a developer perspective or blended use; it's also important that regulated ethical positioning lends itself to an ethics of care. However, this complicates the levels of effectiveness for those who anticipate using it. Therefore, it lowers level of attainment; it does not matter that it's positioned with ease of use, and without compliance with a regulatory framework upfront this adoption effort will fail to yield a necessary effective sentiment for all stakeholders

involved in any perceptions of technology acceptance should come from legally, ethically sound determinations that are information backed. Thus, technology is only useful when the law/lore supports it. When it does not, adoption suffers. Therefore, technology is only as good as the ethical/legal governance surrounding it (Bakhteev, 2023).

Lastly, these findings support sociocultural considerations that are in a comprehensive light across the GCC region where dynamics of culture represent customer sentiment and company implementation efforts where there are considerations of privacy expectations/culturally determined factors (personal space or not wanting one's voice recorded or the necessity to re-categorize one's voice due to culturally driven assessments more than what's required by law), these determine what should and should not be done above and beyond what's required by law (Al Boinin, 2023). Where regulated compliance meets socially determined nuances there exists a fully encompassed ethical framing for voice analysis technology (VAT) implementation.

These results imply applied considerations for organizations whereby organizations are required to do certain things. For example, first, organizations are required to have transparent internal policies regarding how voice analysis technology (VAT) systems will collect, store and, process voice-related data and align with localized and international standards. Second, there need to be internal oversight and audit functions to ensure standards are met and deviations are acknowledged and nuanced or exploitative bias is realized. Third, organizations need to stay abreast of legislation to note growing mandates, engage with consortia within similar service-providing industries to adopt ethical AI guidelines and the like to align international and localized

expectations for best outcomes. Ultimately, this reduces legal and ethical risks while encouraging customer trust and employee buy-in, all of which sustain voice analysis technology (VAT).

RQ4 indicates that VAT requires regulatory and ethical considerations which are ever-changing. Adequate regulations, effective enforcement mechanisms, a culture of corporate accountability and internationalized best practices are necessary to ensure that voice analysis technology (VAT) champions customer experience while reducing ethics-based concerns and legal repercussions. For organizations in the GCC where access is culturally and legally convoluted, a need for appropriate governance, ethics and socio-cultural considerations are imperative for effective implementation and sustainable, responsible customer service efficacy.

5.6 Integration of Quantitative and Qualitative Findings

Another major impetus for this portion of the findings is the need to validate and supplement the quantitative and qualitative findings for a holistic understanding of voice analysis technology (VAT)'s role in the contact center customer experience. Thus, both strains are relevant to understand the measurable (quantitative) and important, dynamic (humanistic and contextual) considerations behind those measurements (Hull et al., 2022).

For example, a limitation of the quantitative findings stemming from the statistical findings was that voice analysis technology (VAT) adoption is a statistically significant predictor of customer experience (CX) ($R^2=0.32$, $p < 0.01$; $\beta = 0.39$); thus, quantitative researchers were able to validate hypothesized propositions. Conversely, ethics was determined to be the most prominent theme in the qualitative findings although it only

impacted CX marginally according to regression results ($\beta = -0.026$, $p = 0.052$). Thus, there is a difference in the generalizability of findings based on which findings are validated to greater significance between both analyses.

Thus, the results show how findings from both quantitative and qualitative processes complement one another whenever data supports it, but lacking nuance. For example, a significant strength of the quantitative findings is that they have relative generalizability to the sample population surveyed, what's relevant where and when, unless contextually specific. For example, predictive factors of CX were discovered to be ethical concerns, voice analysis technology (VAT) adoption and awareness of regulatory framework; however, awareness was determined to be non-significant ($\beta = 0.18$, $p = 0.114$). Yet in the qualitative analysis, customers and employees felt that oversight and accountability was lacking which impacted trust, perception of fairness and intention to implement such a system. However, through the numbers, awareness was not significant but relevant regarding perceptions. Thus, qualitative findings are necessary for findings that have latent perceptions, feelings and intentions of behaviors (Sevilmiş et al., 2022).

Connected to the quantitative findings through themes explored in interviews and focus groups for contextual relevance as to how/why voice analysis technology (VAT) impacts customer experience, findings from a more qualitative perspective were mixed. For example, for customers, tangible ease of benefits (as noted faster response times, human-like interactions) supported the positive predictive impact of voice analysis technology (VAT) implementation that linear regressions attempted to statistically formulate. Yet, for employees, intangible disadvantages (limited training and overload,

trust in AI responses) emerged, which ultimately, as found through various anticipated CX outcomes, impact quality and speed of employee engagement. Thus, where trends emerge in statistics and are supported by lived experience lend credence to what's found and how the same technology can create operational ease yet create human and ethical dilemmas simultaneously (Bryda and Costa, 2023).

Similarly, findings about ethical concerns are emphasized by integration. Where quantitative findings suggest an irrelevant negative impact, qualitative outcomes found well over minor incidents relative to ethical concerns which are not trivial. Discomfort with any voice recording, the potential for recordings kept after sessions, and no evident comprehension of what's done with such recordings proved overwhelmingly discussed within focus group sessions. "I was not sure if my recording was stored permanently," with regulatory enforcement not working transparently alongside such interaction, as "They did not tell me how they were going to use it." Thus, it's assumed that such concerns manifest in a short term tolerance of voice analysis technology (VAT) to embrace efficiency or efficacy but if left unregulated over time, they could severely decrease long-term compliance and engagement. Thus, ethical considerations should not emerge as secondary but critical to the long-term implementation of voice analysis technology (VAT) in contact centers (Ogungbesan, 2023).

Finally, where demographic testing offers additional context relative to integration. Younger voice analysis technology (VAT) interaction participants (18-35) were consistently more successful than older participants (46+), revealing generational differences concerning technology adaptation and literacy, digital literacy comfort levels, and trust. Therefore, when combined with qualitative findings of clear communication as

to best practices that emerged from such sessions for ease of use lend themselves to specific best practices for educational efforts/information efforts for any user of voice analysis technology (VAT) commercial settings; age-appropriate onboarding language or clear enough privacy statements with opportunities for give-and-take would work best to ensure equitable implementation for assumed better CX experience across the board (Elin and Rapaport, 2023).

Finally, the integration clarifies how customer experience, ethical perception and awareness of regulations are interconnected. On a surface, statistically descriptive support suggests that CX is largely predictable through voice analysis technology (VAT) implementation but thematically, especially without ethical consideration to appeal to subsequent recommendations, perceived ease of use with perceived efforts potentially wastes time and renders the customer distrusting and/or regretful. This aligns with the responsible AI literature suggesting relevance, human centricity and governance come into play (Sigfrids et al., 2023). In short, voice analysis technology (VAT) cannot simply be a VAT; it must have ethical considerations to recommend and engage with to support its position as the best and most efficient means of offering positive CX.

From a theoretical perspective, findings add to the existing literature of technology adoption, affective computing and customer experience. The Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) apply to perceived usefulness and perceived ease of use however the qualitative findings lend themselves to an extension of such studies through ethics and regulations and social dynamics which emerge through adoption and satisfaction (Alyoussef, 2022). Essentially, hitching a ride through effective models for adoption

combined with ethical awareness, privacy and demographic sensitivity appeal to more than research-driven managers for practical insight.

Practically, the quantitative and qualitative findings lend organizations a better sense of how to proceed with implementation moving forward through the use of voice analysis technology (VAT). First, operational implementation should rely on where the voice analysis technology (VAT) would be most efficient but bring in personalized efforts to share with the creators including an awareness of privacy, informed consent efforts and transparent disclosure to customers. Second, employee buy in is necessary meaning that those agents need to be trained properly to realize when a voice analysis technology (VAT) is being used, when mistakes are made, and how to effectively resolve such issues maintaining quality engagement. Finally, organizational efforts must be oriented towards sustained engagement relative to policy meaning that organizations should consistently review new legislation that's available and position their policies accordingly, with international appreciation, for compliance and ethical accountability in order to maintain the integrity of customer experience (CX). Thus, across the board—operationally, ethically and policy-driven—effective engagement should ensure risk is minimized through appreciating what people want most from such offering.

Ultimately, regardless of independent findings pointing towards success for voice analysis technology (VAT) as a technologically mediated means of engagement boasting increased efficiency and elevated customer experience (CX), both fields find that it's not merely the ease of implementation but relatively similar access through human-factorized expectations make engagement/adoption predictive for successful means governed by regulations. Essentially, findings support subsequent appeal to

policymakers and link this study to subsequent hybrid AI/Human implementation (Caldwell et al., 2022).

5.7 Implications for Practice

The present study boasts many practical implications for more comprehensive mechanisms for voice analysis technology (VAT) implementation that ensure customer satisfaction, ethical stewardship and regulatory compliance. First, organizations should note that the findings suggest that a combination of AI and human engagement is the best way to move forward with voice analysis technology (VAT) in contact centers. While quantitative findings from hypothesis testing showed that implementing voice analysis technology (VAT) considerably increases customer satisfaction, qualitative findings explored that human agents are still necessary to convey nuanced meanings for situationally ambiguous emotions and culturally specific responses. For example, a voice analysis technology (VAT) may recognize a distressed caller by detecting a higher tone or faster-than-average vocal speed. However, understanding the nuances of intercultural contexts relative to the Middle East (GCC) requires an educated employee who will know that their voice analysis technology (VAT) is not automatically judging them for an impatient or angry call but delivering sympathetic, personalized service in line with cultural considerations (Babatunde et al., 2021). Thus, organizations should staff these centers with employees who supplement AI with actionable, emotional intelligence-based assessments instead of solely using AI to streamline efforts at the potential cost of relational quality and trust.

Second, organizations must emphasize ethical stewardship in line with these findings. Recognizing that privacy concerns, informed consent and perceived

transparency shape customer trust (though only to a decent extent for the latter two), organizations must become more transparent in their policies regarding voice data. Since many players on the international stage possess ethical AI guidelines—like the General Data Protection Regulation (GDPR) which outlines data collection, use and storage principles—combined with country-level regulations pertaining to voice data governance under the auspices of the GCC AI ethics guidelines, organizations operating in both HR regions must ensure maximum compliance (Atmaja et al., 2022). Therefore, organizational efforts should include opt-in processes for data collection, customizable settings and in-process mechanisms aligned with privacy awareness efforts so customers feel comfortable and respected and thus develop trust over time. In addition, organizations must regularly audit AI processes to ensure there is no bias, violations of data input/output and other unethical considerations to effectively acknowledge these concerns to turn ethically-based research into reliable practice over time.

Finally, a means through which effective implementation occurs is continued education and transparency among customers and employees. For example, one major finding for customers was that they felt reasonably comfortable using voice analysis technology (VAT) but still were not entirely sure how it worked and whether their voices were recorded or stored. Organizations should keep customers educated on the benefits relative to voice analysis technology (VAT) implementation versus traditional call centers before moving forward and maintain transparency about data collection so customers can feel comfortable giving such details up. The more customers understand what can be done with their information and what cannot, the more comfortable they will

be, reducing trepidation levels for more favorable calls. Similarly, from an HR perspective, training all employees relative to the success of implementing voice analysis technology (VAT) is crucial. They must understand technical aspects of how it works and ethical dimensions regarding privacy and data transparency to help answer customer questions regarding any shortcomings of AI versus what AI can provide vicariously through personalized service.

Thus, in terms of what an organization would implement the results of the research, the relative positioning of voice analysis technology (VAT) comes down to it being a supportive tool and not a replacement for what human agents can do. Voice Analysis Technology (VAT) allows agents to take more personal, emotion-driven calls because the technology upgrades the more menial aspects of a call process to determine what's at stake for the customer to convert into a faster resolution situation. Thus, combined with the relational aspect of a human agent, leaders can bolster service results with agent productivity and customer loyalty potential, a competitive advantage in increasingly automated service-providing fields (Marelli and Dello Sbarba, 2025). Furthermore, organizations should continue a momentum with legislative advancements, meaning that changes should be actively tracked to ensure data security and AI compliance and ethics are feasible across different geographical arenas. Engaging with regulators, participating in discussions across departments, and applying best practices allow an organization to be a responsible AI implementer instead of one unintentionally functioning outside legal and ethical bounds.

Ultimately, practical application is another realm from which results can be garnered. This is not a one-and-done situation, but instead an ever-changing endeavor,

keeping track of customer feelings, agent needs, and AI information to merge voice analysis technology (VAT) with the most relevant data and avoid future complications either in employment or ethics when tools are no longer new or become obsolete. Results compile all potential areas of practical application into a cohesive framework for optimal customer experience while simultaneously bolstering compliance efforts and worthy company credibility. This works best when linked to oversight and governance factors as well as a clear strategic and ever-changing application. Therefore, these findings would essentially support a successful implementation and over time, since this research is based on current developments and situations it helps support such successfulness for the sustainable organizations over time. Overall, these findings provide a research-based practical application for the best-case scenario for successful AI voice technology implementation in contact centers.

5.8 Limitations

Despite this study's thoroughly exhaustive findings, various limitations exist which lend a critical sense of contextual interpretation. First, while the $n=40$ was sufficient for a purposeful mixed-methods approach for methodological exploratory relevance to a quantitative distribution, the statistical significance can only be applied to the study at hand and not the GCC region as a whole. While purposeful and subsequently stratified random sampling yielded sufficient demographics between customers and employees for all involved channels, the low n 's limit subgroup analysis along age and cultural and professional lines. Therefore, while findings presented are sufficiently effective preliminary data, future studies conducted in higher n 's or across multiple centers in multiple fields would not only allow for practical generalizations but also more

successful inferential assessment of voice analysis technology (VAT) in ethics and customer experience. Moreover, future studies would allow for intraregional findings as well to detail organizationally-regional concerns and best practices between countries, for the GCC countries differ from each other in compliance differences and socio-technological considerations, suggesting different obstacles and benefits relative to implementation.

Second, while findings are generalizable at a static point in time through surveys, interviews and focus groups, the study failed to acknowledge the longitudinal evolution of employee and customer experience. Finding credit initial impressions of concerns and considerations relative to ethics and regulation awareness without acknowledging whether benefits or concerns arose after the fact. For example, certain ethical concerns might be concerns at the start of customer use of voice analysis technology (VAT), but over time, might be set aside when interactions become more routine and AI communication familiarity becomes commonplace. Conversely, new ethical concerns might arise based on technologies at hand as this adaptive phenomenon becomes more advanced. Similarly, initial concerns about privacy might overshadow initial excitement but might not matter down the road when data protection measures are in place, or new adaptations present no need for data collection. Additionally, over time, more definitive findings will emerge for long-term application of voice analysis technology (VAT) with re-framed implementations with reinforcements either determining no clear logical application for voice analysis technology (VAT) or ease of use, or immediate necessity for re-collaboration for enhanced adherence to international regulations.

Third, while mixed-methods provided as much quantitative and qualitative triangulated insight as possible for consideration, qualitative limitations for collection and analysis exist. For example, interviews and focus group responses might be inherently subject to social desirability bias where employees aware of questions about organizational ethics and privacy or relevant regulations might have inflated compliance or underreported challenges to save face, personally or professionally. In addition, despite thematic analysis through coding frameworks with inter-rater reliability audits (Cole, 2024), qualitative data collection is subjective based on investigator bias. Even transparent methodological insight throughout the study process fails to recognize these insights as pertinent to fostering quantitative generalizability to larger populations and different settings.

Fourth, while the GCC context is something unparalleled and legally qualitative in findings that would appropriate and justify voice analysis technology (VAT), it is important to note that the assessability to other world regions is a bit lacking. For example, due to sociocultural expectations, general awareness, a myriad of languages and the regulations of different regions, the impact on customer perception and employee perception is vast which means findings could be hugely different in the West, or Asia, or the Middle East, or anywhere else. One never knows if findings would be truly different in places with different legal stipulations (privacy versus data collection expectations), customer service expectations (employee politeness and attentiveness) or more. Therefore, cross-cultural comparative studies would be suggested for researchers to determine voice analysis technology (VAT) findings that are generalized

across regions as well as region specific so that theoretical endeavors can better support multinationals looking to employ ethically championed AI systems.

Finally, the study did not empirically test independent voice analysis technology (VAT) factors from a technological perspective. For example, how accurate is the emotion detection software, voice detection software compared to languages spoken by participants in the region or interoperability with legacy systems already in place at call centers. While participant satisfaction remarked upon some of these perceived negative constructs, in many ways this study relied upon personal experiential subjectivity versus performance based metrics. Future studies which can test system accuracy, failures, time-in-system vs time-on-call analyses in development can assess if there is a causative relationship between technological metrics and perceived customer development. Thus, implications for practice, theory and policy can gain more powerful persuasion when presented in a real-world call center setting with additional technologically governed findings.

Ultimately, this study serves not only to assess voice analysis technology (VAT) based upon what was already known, but also to find a new practical addition to real-world findings relative to ethics and customer experience implications that will champion this approach with other voice analysis technology (VAT) findings regardless of contextual placement. Yet the limitations discussed based on sample size, cross-sectional nature, qualitative subjectivity, regional nuance and technological assessment which were determined by the researchers to signal important avenues of continued investigation where these findings can become generalizable, longitudinally applicable across many cultures and statistically significant so researchers and practitioners alike

have a well-developed assessment from improved theoretical exploration that champions practical findings since they are more appropriate and practically aligned for organizational implementation of voice analytics technology.

5.9 Future Research Directions

Apart from sample size and duration limitations, countless avenues for future research exist relative to this study's limitations, findings, and theoretical contributions that will facilitate a deeper understanding of the implementation, usage, and implications of voice analysis technology (VAT) for contact center employees and consumers. Greater samples and longitudinal studies would improve findings. For example, this research is based on mixed-methods research conducted with 40 participants. Still, comparisons could be made across organizations, industries, and countries within the GCC, other parts of the Middle East, and broader global considerations. Ultimately, this means studying larger populations where researchers can analyze sub-group dynamics (age, gender, occupation, technological familiarity) and with longitudinal studies researchers can assess changes in perceptions over time. This study assessed awareness in relation to ethics, privacy, and regulation but not response/change over time. This would be valuable for assessing patterns of acceptance/adoption (and rejection) over time as consumers and employees more familiarized themselves with the human-AI borderless collaborative. Will initial privacy issues recede into the background in light of perceived efficiency and personalization (or vice versa if new ethical challenges emerge with familiarity to increasingly advanced technology) or will new ethical concerns emerge as cited by (Khamis, 2024), note that more advanced algorithms operate that assess emotion or intention based on voice tonality or facial

recognition merged with predictive analytics? Longitudinal studies could reveal whether perceived advantages are one-time novelties or potential downsides are temporary efforts; regardless, awareness would help researchers and business practitioners acknowledge the best practices to maintain ongoing trust and loyalty with either group for superior customer experience (Singh et al., 2023).

Secondly, comparative studies across industries, regions, cultures and legislations would expand situational impact contributors to voice analysis technology (VAT) implementation and perception. For example, while this study is limited based on a GCC context drawing conclusions from it, researchers could find different cultural or global contexts to support or work against customer and employee responses to a greater or lesser degree based upon socio-cultural expectations, privacy concerns and regulatory power levels. For example, countries who boast large anti-technology factions may experience slower AI-generated voice analytics implementations than countries comprised of tech-savvy citizens while countries whose developments in anthropological discovery and ethical tolerances boast more findings for comparison and contrast than the Gulf. Culturally nuanced international differences in acknowledgment (or lack thereof) of privacy, levels of regulation needed for successful implementation vs. ease of use, power distance vs. customer expectation fairness and tolerance based upon socioeconomic balance (or imbalance). Thus, generalizability to European regions or North American regions could establish patterns and discrepancies for emerging international, cross-cultural AI attribution literature that best supports organizations in developing global voice analysis technology (VAT) programs that succeed through meaningful regulations, cultural tolerances and consumer awareness.

In addition, studies in different contexts like banking vs. telecommunications vs. healthcare vs. government contexts would lessen or complicate challenges based on tech gaps for implementation, ethics related to the specific workforce connected to each topic and other variables.

Third, future research should explore voice analysis technology (VAT) system effectiveness, limitations, and reliability. Since this study was based on perceived effectiveness of the system from clients and employees, one avenue of research to explore voice analysis technology (VAT) implementation versus human perception would be to gauge reliability based on concrete numbers in voice recognition effectiveness, emotional recognition degrees of separation, sentiment analysis strengths, and predictive abilities for effective engagement to measure the feasibility of technology against perceived human efforts to see how reliable the system may be compared to organizational voice analysis technology (VAT) efforts in real-world application (Cho et al., 2021). Furthermore, research could assess effectiveness based on dialectical, linguistic, and cultural nuances in speech. For example, the GCC operates as a largely multilingual area and exploring such an aspect could help bridge gaps in inclusive recognition or limitations of speech in an empowered cultural context to ensure voice analysis technology (VAT) systems are as reliable as possible in relation to area communication efforts. As a result, when future research seeks to take a more systems-oriented approach with a human application, it's clearer how assessment may bridge the gap between what the system can do and what the customer can achieve.

Fourth, the organizational dimension of voice analysis technology (VAT) implementation needs further study with respect to ethical governance, regulatory standards and employee approval of such advancements. Where voice analysis technology (VAT) was suggested to create more efficiency and customization, privacy, consent and justice were still problematic which suggests that organizations do not yet have the proper governance in place to mitigate ethical concerns. Therefore, future research could investigate how organizations could help in employee training, AI literacy endeavors, audits and internal oversight or ethics committees with a focus on responsible voice analysis technology (VAT) construction and application (Murtezaj et al., 2024). In the same way, the effectiveness of third-party accreditation, regulatory guidance and transparency initiatives over time could help responsibly apply voice analysis technology (VAT) in organizations to make it safe for customers and employees, alike. This would include analyzing how organizational culture, policy making and leadership would support ethically responsible approaches to voice analysis technology (VAT) to empirically support best practices which the current study cannot implement but managers would want to know to safeguard customer rights and preserve public trust.

Ultimately, emerging AI capabilities are an interesting pathway for future research. Developments such as multimodal emotion recognition, conversational AI agents, predictive customer behavior and analytics, real-time behavioral modeling improve upon current voice analysis technology (VAT) capabilities while creating new challenges of privacy, transparency, and ethical responsibility (Yordanova, 2023). Future investigations should explore the developments of these advanced technologies

in comparison to current voice analysis technology (VAT) applications and their impact on the customer experience, customer satisfaction, customer trust, and perceived fairness. In addition, a more nuanced understanding of the ethics of predictive/proactive AI-driven responses (such as bias, algorithmic opacity, unintended consequences) would support responsible future developments of next-gen customer service solutions. Thus, this line of research champions a multidisciplinary approach that is context-specific and ethically designed for responsible implementation that benefits both organizations and customers.

Future research opportunities emerge for longitudinal findings for generalizable contributions; large sample studies; cross-cultural explorations; implementation performance evaluations to assess quality of voice analysis technology (VAT) development; organizational governance studies to assess responsible application; and investigations into new AI developments that could complement employee customer service offerings. Exploring these options will not only theoretically contribute a cross-over of voice analysis technology (VAT) implementation for a mediating effect on the customer experience but also practically support responsible, ethical and effective implementation for organizational viability across varied settings. Therefore, scholars and practitioners would benefit from a more comprehensive understanding of an evidence-based and human-centric approach to technological advancements in the realm of customer service for a more fair, logical, culturally sensitive approach to effective customer service.

5.10 Conclusion

The findings of this study extend to enhance the understanding of VAT's positioning in contact centers, especially relative to the socio-cultural, ethical and regulatory context of the GCC, whereby voice analysis technology (VAT) is not simply a technological development but an all-encompassing intervention that seeks to realign customer journeys, internal operations and ethical and regulatory considerations and obligations. Furthermore, the mixed methods findings through a quantitatively survey and subsequent qualitatively driven interviews and focus groups suggest a level of respect not only for the transformational capacities of voice analysis technology (VAT) but also the complexities that ensue inherent in its adoption.

From a customer experience perspective, findings revealed that voice analysis technology (VAT) can significantly enhance efficiency, personalization and resolution. Customers experienced that voice analysis technology (VAT) was a more efficient way of getting answers and questions processed and that there was first-contact resolution under which issues were solved in one experience. These findings validate that voice analysis technology (VAT) can increase operational efficiency and subsequent customer satisfaction as does prior literature in AI-enhanced customer service (Pamisetty et al., 2022). However, while quantitative findings supported operational efficacy, qualitative findings revealed that customer satisfaction comes from trust, transparency and fairness. Therefore, while voice analysis technology (VAT) may perform in an operationally sound fashion, it's important that it is developed ethically, that consent is visible, and what takes place is guaranteed to be through responsive

action. In other words, customers are more inclined to use voice analysis technology (VAT) when they can trust it.

Finally, the third theme intertwined with customer acceptance and employee acceptance of voice analysis technology (VAT) was based on ethics. Participants commented that privacy, informed consent, data protection and biased automatic decision making emerged as potential deterrents to want to collaborate with an automated tool. This suggests that no matter how operationally effective voice analysis technology (VAT) is, being ethically sound and ensuring ethical operations to protect all parties will only increase better acceptance results. As cited by Morley et al. (2021), from which assert that without operationalization, ethical principles do little to protect against unintended challenges for organizations. Therefore, generalized findings relative to the ethicality of decision making from this study contribute to responsible AI literature with universally applicable approaches to organizations craving empowered creativity with responsibility.

Voice Analysis Technology (VAT) was a window into possibilities and risk. Yet while participants acknowledged reduced redundancy and a push for better efficiencies, they acknowledged training gaps, system reliance and responsibility awareness to decide. These findings are validated by the literature which asserts that AI implementation is best when humanistic through capacity building measures to change management to retained facilitative resources (Fenwick et al., 2024). Therefore, these findings support voice analysis technology (VAT) as necessary for ethical, implemented AI through a framework for intervention, training, and responsibility for sustainability since it takes the worker's voice into consideration first.

Another subtheme that emerged relevant to regulatory pressure was awareness. Despite the presence of guides and regulatory steps across the GCC region, however, minimal awareness and appreciation existed of such initiatives, suggesting a top-down, proactive approach is warranted that communicates policy avenues with transparency and additional training for customer confidence and employee trust. Minimum standards should not be enough, but rather environments where stakeholders and companies adhere to organisation for economic co-operation and development (OECD) ethical AI standards through ownership and accountability (Camilleri, 2024). Without such proactive awareness, organizations that could be providing benefitting services to unaware stakeholders remain doing them a disservice.

Besides the practical applicability of this research compared to the literature, this study supplements a new AI-based customer service application with existing technology adoption literature as well as the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) frameworks wherein the findings' ethical and regulatory components serve as a framework to extend better awareness of expected success based on voice analysis technology (VAT) implementation. Furthermore, with a mixed-methods approach with qualitative richness to quantitative precision, this study outlines practical means through which replicable future studies on technology for service industries can be applied.

The future of voice analysis technology (VAT) and artificial intelligence (AI) in the call/contact center world seems to be established by the next wave of machine learning, natural language processing, sentiment/emotion detection, and predictive analytics. Future implementations will probably be more proactive than reactive at the point of

learning how to preempt questions before they become questions asking how to avoid them at the point of challenge. This would lead to reduced resolution times, higher first-call resolution rates, and improved lifetime customer value. Yet new ethical and regulatory concerns emerge with possible data security concerns, algorithmic bias, and autonomy on behalf of automated systems.

Ultimately, researchers suspect hybrid (VAT + human) will be necessary for efficiency, but compassion and humanistic guided resources will be necessary without bias from algorithms. Continuous processing, auditing and training will need to be in place for organizations to ethically guarantee sustainability relative to shifting regulatory requirements. Research could then benefit from longitudinal results that capture a breadth of changing perceptions about levels of trust over technology adoption dynamics that impact long-term relationships and customer experience.

For Customer Services, voice analysis technology (VAT) is as much a technological advancement as it is a competitive, ethical and functional leverage. The successful implementation of voice analysis technology (VAT) requires technological prerequisites, ethical considerations, regulatory constraints and a humane angle. Those companies that figure out how to best leverage time and money savings while taking into consideration ethical impacts and the best interest of the customer will create a new standard in Customer Services. In addition, what can be learned from the article is both a theoretical and practical nature which will enable informed, culturally aware and sustainably effective implementation of voice analysis technology (VAT) in call centers for the future. Therefore, as much as voice analysis technology (VAT) has the potential to create operational efficiencies, it also has the potential to be a socially responsible,

ethically beneficial and technologically propelled implementation for the future of agent-customer relations.

Chapter 6: Summary, Implications and Recommendation

6.1 Summary

This chapter serves as the final wrap-up to this study as findings transform into a persuasive conclusion related to the original research questions, key findings, and wider implications. Thus, there will be three distinguishing factors in the organization of this final chapter: a summary of findings, meaning of implications, practical and theoretical value to contact center directors, regulators and future researchers, with this study aiming to disseminate findings in the best fashion for a strategic approach to ethical implementation of Voice Analysis Technology (VAT) in contact centers, with a specific focus on the Gulf Cooperation Council (GCC).

6.2 Summary of Findings

The central approach of the research process was a sequential mixed-method investigation into the customer-experience (CX) and ethical parameters of VAT in contact centers, whereby integrated findings include a quantitative survey of 40 participants, as well as qualitative threads from interviews and focus groups, leading to the following answers to the original research questions:

Voice Analysis Technology (VAT) Significantly Impacts Customer Experience (RQ1): VAT is a strong predictor of CX ($\beta = 0.39$, $p = 0.008$). VAT accounted for 32% of CX score variance on a 5-point scale; from quantitative findings, customers experienced "My issue was solved in the first call without repeating details", "I had to explain my case only once", and "They made me feel like I was special", illustrating that VAT reduces customer effort and increases CX.

Ethical Concerns are a Strong Risk to Trust (RQ2): While participants acknowledged the efficiencies gained, ethical concerns may present a strong negative risk to retention and long-term usage, as ethical concerns had a mean score of 3.14 from a 5-point scale, with ethical concerns being nearly a negative predictor of CX ($\beta = -0.26$, $p = 0.052$). Qualitative responses revealed four themes: 1) data privacy (I was not sure if my recording was stored permanently), 2) no consent for use, 3) negative algorithms from accents/dialects compared to others and 4) unclear support for AI-generated efforts - creating an unfamiliar relationship.

Customer & Employee Understanding is Unclear (RQ3): There exists a comprehension-comfort paradox. Customers appreciated the proactive attempts to fill in the gaps and solve problems on their behalf but did not understand how it stayed secure/stored/retained for archival purposes. They were comfortable in rarely repeating themselves due to past use but not necessarily effective understanding of how AI worked. Employees indicated that AI could enhance their quality of work but were uncertain about having less training as they instead had to understand what AI suggested, reducing recommends on overtime when AI suggested they were not good enough at their jobs.

Regulatory Frameworks are Nonexistent (RQ4): The mean score for Regulatory Frameworks is 2.95; thus significant differences exist between those who acknowledge regulations are in place versus those who do not - perceptions suggest that regulations are nonexistent. Many were unaware of any regulations - No one from outside the company checks how this data is being used - which indicates an uncertain territory where ideally, regulations will be sorted out at most.

6.3 Study Contributions

The results of this study have theoretical and practical contributions to knowledge.

6.3.1 Contributions to the body of knowledge.

This study contributes to the body of literature in the following ways:

Scale Generalizability: Relative to prior research conducted on the Technology Acceptance Model and UTAUT, perceived ethicality and trust are as important as perceived ease of use and usefulness as means through which GCC-based participants intended to use AI-based VAT for (virtual) customer service. Furthermore, perceived ethical concerns' somewhat negative impact on CX represents a new addition to AI adoption research scales - perceived risk.

Connecting the Empirical Literature: One of few studies conducted from based upon the GCC's socio-cultural context, thus, the contextual gap significantly contributes to empirical literature. It's a measured means to compare data relative to other regions to which international AI ethics standards must be applied to localized ethical considerations and legal ramifications.

Human-Centered AI: As theory surrounding a human-centered approach to AI development has yet emerged, this supports that AI-based VAT's success is not relegated to its algorithm but rather, much more human-centered facets of agent training/development, customer awareness/transparency, and organizational culture.

6.3.2 Practical contributions to the body of knowledge.

For contact center managers and companies in the GCC and beyond, the findings suggest:

A Human-AI Complementary Approach: The VAT works best when not to substitute humans but rather, complement them; thus, having VAT serve as a diagnostic tool (with emotional cueing recognition) allows human agents to develop their empathetic capabilities, cultural sensitivity, and critical thinking skills required for complex problem-solving.

Clear Ethical Information Is Needed: Ideally, more than a vague "this call may be recorded" should serve as explicit informed consent, as companies need to provide clear criteria for what VAT is, what voice data will be collected, how it will be used, and for how long. Whether a customer wants to opt out or if they have the right to deletion should be disclosed - from a no-documentation perspective after-the-fact - immediately.

Resources Should Be Invested in Employee and Customer Training: It's not enough for employees to be trained on VAT but ethically trained in how to use it, how to respond to suggestions/comments they've never heard before, and how to best convey value-added transparency to the customer. This makes agents less fearful of employing it.

Corporate Governance and Internal Bias Audits Are Necessary: Companies should create an internal AI ethics committee that regularly reviews their VAT for accents, genders, ages, etc., that could bias certain subpopulations or make them believe their data is being unethically manipulated. It's a lot easier and cheaper than any PR disaster later down the line.

6.4 Recommendations

By bringing all of the research findings and implications together, these practical recommendations can be made:

6.4.1 Recommendations for contact center management.

Establish and communicate a voice analysis technology (VAT) Policy - Have a transparent VAT approach to data and customer treatment which is regulated and condensed to easy-to-remember bullet points that can be recited within the tenets of a call.

Stepwise Integration with Ongoing Support - Start small with VAT integration where agents are continuously supported technologically and sentimentally. As issues arise, agents should report back with feedback for continuous system refinements.

Cultivate an "Ethics by Design" Mentality - This should come through procurement and implementation, not after the fact. A VAT provider should demonstrate how it can uphold fairness, transparency and security all along the way - even before any data is processed.

6.4.2 Recommendations for policy makers and regulators (GCC Based).

AI Ethic Using GCC Considerations - Broader implementations like GDPR can essentially encompass AI ethics policy across customer facing industries with enough guidelines for specific technologies like VAT in place.

Certification Regulation - There should be an established certification recommendation process which can certify VAT technologies to allow for ethical integration and suggested operation assessment so that organizations have publicly recognized symbols to uphold to justify their own use.

Consumer Awareness Efforts - Educate consumers about their digital rights and what AIs like VAT can/cannot do to ensure personal awareness empowers consumers to make better decisions about organizations based on who implements what.

6.4.3 Recommendations for future study.

Longitudinal Studies - Assess customer and employee sentiment towards VAT from beyond the 6 month threshold to 12-24 months to assess whether trust and acceptance grow over time.

Cross-Cultural and Cross-Industry Study - Review this same study in other GCC nations and industries (healthcare vs. telecommunications) to see whether there are more subtle distinctions within both ethical considerations and integration facilitators.

Technological Accuracy Study - Work with computer science experts to determine if VAT is technologically accurate in emotion prediction based on tone from the diverse dialects and demographics of the GCC population so perceived accuracy can transform into real-world performance statistics.

6.5 Limitations, Methodological Reflections, and Future Research Directions

While many contributions exist to the literature regarding customer-experience (CX) and ethical perceived accuracy of VAT in GCC contact centers and more, the following limitations should be assessed to better understand the findings and support transparency.

6.5.1 Research gaps.

The generalized sample size of the quantitative element of this research stems from a sampling of 40 persons. While this is an acceptable exploratory approach for a mixed-methods study, it's still a bit small for generalized conclusions to be drawn within the larger GCC population as a whole, especially in a region rife with diverse demographics, languages and cultures. A larger sample (or expansion effort to take this research further) could find more tenuous, less tenuous or even more significant

correlations as perceived ethicality was a particularly interesting finding that aligned with literature on perceived ethics but almost strongly significant but in the opposite direction for CX.

Recruitment methods of participants were obtained through voluntary and convenience sampling. This is significant because it means that there's a potential for self-selection bias where those who are more advanced in technology or less satisfied with their experience may have been more willing or able to respond than those with lower digital literacy thresholds, less exposure to VAT or those with greater privacy preferences.

Time Constraints and snapshot perspective of this cross-sectional study which reports one instance of perception. Perceptions about AI tools like VAT shift pretty quickly, dependent upon how acclimated customers become to the technology and how well organizations implement the tool in the long run. Therefore, this finding is a reflection of an attitude assessment at one time and suggests that CX trust, ease and acceptance may fluctuate through the life of the VAT.

Access Constraints for Non-Human Auditors who did not have access to specific coding audits of the VAT programming or any back end assessments due to confidentiality and proprietary access; instead, this study assessed perceived ethicality and perceived accuracy. The limitation here is an assessment not based upon real-world algorithmic capabilities or biased results that are important because perceived accuracy could yield drastic differences than technical accuracy.

Limited Cultural and Linguistic Diversity While this is a GCC study, many participants were from relatively metropolitan areas and it's assumed that dialectical

differences and socio-cultural differences are not adequately represented from the entire GCC region.

6.5.2 Methodological reflections and options for choices.

The sequential mixed-method design was purposefully connected, with qualitative findings supplementing quantitative trends since VAT measures both an objectively measurable (CX scores) and a highly subjective (privacy, trust, comfort, and dignity) construct. This helps ensure that researchers use a quantitatively assessable aspect relative to previously established models (TAM, UTAUT) and a more qualitatively assessable aspect relative to an underexplored region's ethical concerns (GCC) and cultural considerations.

Yet, future researchers may expand upon the findings by expanding the probability sampling for greater generalizability; expanding the larger and more GCC cases for cross-national databases; conducting ethnographic/observational research in the call centers; applying a mixed-methods approach for customer appeal with a more audit-based, algorithmic operational determination.

All of these would increase causal conclusions and culturally based context.

6.5.3 Directions for future research

The limitations discussed above directly inform several capable opportunities for future research:

Longitudinal Studies: The next step for research is to engage consumers and employees in a longitudinal study over 12-24 months to understand whether trust, perceived equity, and dependence on VAT evolve over time with continued exposure. This is a drawback of the present cross-sectional study.

Cross-Cultural and Cross-Industry Comparisons: Future research should examine VAT in different regions of the GCC and different sectors (i.e. healthcare, aviation, government service centers) to establish if the value judgements, cultural implications and user needs shift based on sector and regional awareness.

Algorithmic Accuracy and Bias validation: Computer scientists to implement studies that validate or explain VAT accuracy across GCC dialect, language, gender and age to gauge if the perceived bias is truly a fault of the algorithm. Such studies would close the divide currently present between perception and what exists in the literature.

Regulatory and Governance Impact Studies: Future researchers may explore the role of AI ethics policies, accreditation initiatives, or other data protection legislation on consumer trust and business implementation which would substantiate AI governance endeavors of regional policymakers wanting to enact such considerations.

Human–AI Collaboration Models: As this research determined that VAT and human agents are synergistic, future research would formulate and test training models, workflow arrangements, and communication standards that improve employee appreciation and customer understanding.

6.6 Conclusion

This dissertation posits that Voice Analysis Technology has the power to reshape customer experience like never before facilitated within the contact center realm with hopes of efficiency and personalization, yet such potential relies on the proper ethical considerations of use; implementing the technology is not a purely tech-driven process, but organizational and sociological.

Therefore, the overwhelming success of VAT is not contingent on algorithms alone, but how an organization chooses to leverage the technology for transparent, equitable and human-first motives from both sides of the line. For GCC organizations - and organizations worldwide - the possibility to use AI is not a means to service customers at a scale, but to secure trust in a growing automated world. This dissertation explains how such trust can come to fruition through a balance of practicality and ethical practicality.

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APPENDIX

1.1 Human Society Theory Survey

Survey Question	Response Option	Percentage of Respondents
How familiar are you with voice analysis technology in contact centers?	Very Familiar	30%
	Somewhat Familiar	45%
	Not Familiar	25%
How important is personalized service in your customer experience?	Very Important	55%
	Somewhat Important	35%
	Not Important	10%
Do you believe voice analysis improves agent-customer interactions?	Strongly Agree	40%
	Agree	35%
	Disagree	15%
Have you ever felt uncomfortable knowing	Yes	50%

your emotions were analyzed?		
	No	50%
Would you be more likely to use a contact center that utilizes voice analysis technology?	Yes	60%
	No	40%

Data Source: Bank Muscat Contact Center employees, 2025

1.2 Questionnaire: Attached

1.3 Participation Information Sheet

Study Title: The crucial role of contact centers in enhancing customer experience and the ethical considerations associated with the adoption of voice technology

Researcher: Shaurya Bhasin

Institution: Swiss School of Business Management Geneva

What is this study about?

This research study how voice analysis technology impacts customer service in contact centers and review ethical considerations like privacy, consent, and fairness.

What will I do?

Option 1: Complete a 10–15 minute anonymous online survey

Option 2: Participate in a 30–45 minute interview (virtual/in-person)

Option 3: Join a 60-minute focus group discussion

Your rights:

- Participation is voluntary
- You may withdraw anytime without penalty
- You may skip any questions you prefer not to answer
- All data will be anonymous and confidential

Data protection:

- No personal information is collected in surveys
- Interviews/focus groups: No recording will be used or shared

By participating, you confirm:

- You understand this information
- Your participation is voluntary
- You consent to anonymous data use for research

Thank you for considering participation.