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Voice Biometric System - Authentication Over the Voice Command from Remote Place - A Case Study

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Abstract

The entire globe has been focused on the security of the data system for the past decade. With every passing day, the requirement to secure virtual data becomes much more difficult. Professionals are exploring towards advanced techniques to secure the access to system infrastructure as the threat to key information such as customer data. Numerous cases are reported daily in which an unauthorized users and fraudsters gained illegal access to system and then used confidential data such as customer information and compromised them. Lakhs of rupees have indeed been lost as a result of this personification, as well as legal issues that are best avoided especially in the banking sector. For a firm, these occurrences frequently result in a decrease in market value and a loss of trust. Passwords, OTPs are no more secure. Many government and industry organizations are in desperate need of an efficient and high-security concept right now. Biometrics technology is the process of automatically identifying and verifying an individual's identity based on an examination of his or her biological (biometric) features. One solution for this is biometric systems. In order to attain this goal, the use of biometric security systems has exploded. Biometric securities are of

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many types such as finger print, iris scan. But these biometric systems require the person to visit personally and confirm its authenticity. For remote security purposes, a voice-biometric system is a very effective and powerful technology among different types of biometric systems. In the voice biometric, person's voice is used as a signature to authenticate him for further access. The user can be recognized and identified from the remote place just from the voice. Voice Biometrics technology is seeing a lot of development. In this paper we are working on a short case study of Uniphore Company that has already implemented a voice biometric system and speak about how this Speech Recognition Technology can be used for information security concerns and boost customer trust towards the organization.

Keywords: Voice Biometric, security systems, automatic identification, authorization, uniphore

1. Introduction

In today's world, the word "security" is quite essential. In this setting, biometric systems play a critical role in maintaining an individual's identification based on physical and behavioral activities. We are living in an era where all actions, whether in the financial, medical, educational, national security, software, or other fields, are carried out through the internet with the individual being at a remote location. In such a situation, a person's identification and authentication becomes a critical duty. We utilize a combination of login and alphanumeric passwords to verify a person, but these passwords are not secure because anybody may get these data and gain access to the system. A human does not have the capacity to recall all of the secret passwords required to conduct his/her transactions (commercial or business). Concerned person has to preserve them in a specific trusted storage (database template), and even if he/she could save or recall them, the risk of theft and forgery is real. It becomes vital to verify the person's identity without making physical contact. People, understandably, rely on observable human body attributes such as face traits, voice, stride (walking style), signature, and so on. Because these qualities are unique to each individual, these methods are great for

recognizing others. With the rise in popularity and domination of technology, particularly computational systems that deal with commercial transactions, such as online banking services, Computers / smart mobile phones are used intrinsically by users to carry out their everyday tasks. Bank accounts, mails, everyday transactions, and other activities are examples. These systems save sensitive information on its clients, which is then publicly disseminated on the Internet. The widespread usage of this personal data has increased the security concerns of attackers or unauthorized users illegally accessing or hacking such critical systems. Physiological characteristics and behavioral characteristics are the two primary types of human biometric attributes. Physiological characteristics refer to the features of the human body that do not change with age. Iris, fingerprint, Face recognition, hand geometry, DNA, retina, and identification of blood vein pattern are examples of physiological characteristics. Biometrics' behavioral approach, on the other hand, is confined to human behavioral features that deal with an individual's own behavior, such as signature recognition, keystroke recognition and voice recognition. The Figure.1 shows the classification of biometrics, A speech biometric system is one option for these behavioral biometric mode of authentications. It's a type of technology that uses a user's speech to identify and authenticate the correct individual. A person's dialogue is utilized as a signature for a new enrollment. To access the system, enrolled users must repeat the same speech every time. The user will be authenticated by software for further access. Voice biometrics will gradually replace existing authentication techniques in the future. Voice biometrics is a very effective and powerful approach. It's critical for businesses to accept innovative offers as technology advances. Voice Biometrics is one such technology that is seeing a lot of development.

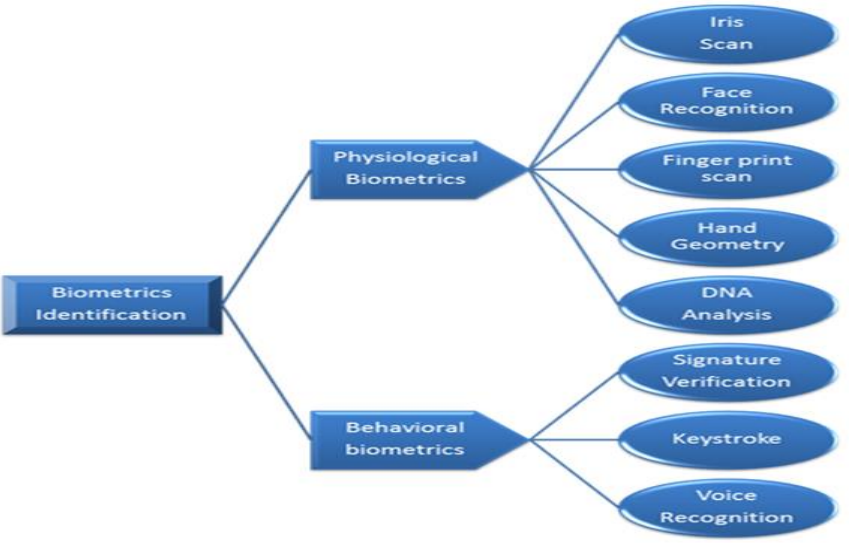

Figure 1: Classification of biometrics

2. About the Company and its Importance

A case study technique called company analysis allows a researcher to look at a firm's previous history, current performance, and future prospects in a certain industry. In this paper we are producing a short case study of Uniphore Company that has implemented voice biometric system by providing solutions through Speech Recognition Technology for information security concerns and boost customer trust towards the organization.

Uniphore Company is utilizing artificial intelligence to address a global problem: bridging the gap between humans and technology by utilizing voices to ensure that everyone is heard. Conversational Service Automation is the way of the future in customer service. Regardless of the person, place, or language, Uniphore's Conversational Care Automation platform provides the most intelligent, accurate, customized, and automated customer service on the globe. It is based solely on natural dialogue, just an actual real-time comprehension of emotion and purpose, with speedier issue resolution.

The company's Conversational Support Automation provides customer service agents with better conversation quality, automated agent duties, automatic disposition capture, and after-call activity. All of this is backed up by an analytics and security layer. Speech Analytics, Virtual Assistant, and Voice Biometrics are part of the company's platform, which transforms how businesses connect with customers, develop loyalty, and save money. Uniphore Conversational Service Automation provides the industry's greatest voice accuracy, the largest language coverage, the fastest latency and reaction times, and the highest degree of intent prediction. Uniphore is the human-like dialogue that is available through whichever interface you are using in the future.

Uniphore was founded in 2008 in IIT Madras, India's leading research institute, and is driven by innovation. Uniphore has grown at an exponential rate since then, and we now have over 400 workers in the United States, India, and Singapore, as well as several of the world's top business customers. Each team member is driven to achieve greatness persistently, with leadership and integrity, never compromising, and always with the long-term goal of doing the right thing.

3. Product and Services

3.1. U-Self Serve

Uniphore's U-Self Serve provides outstanding customer service by providing a cost-effective, quick-to-implement, and simple-to-optimize solution that enhances self-service automation rates while lowering customer service expenses. Highly successful conversational self-service is delivered to enable sales and service engagements across phone, online, and mobile with the use of AI and NLP. U-Self Service has a high-end self-service interface that provides real-time data and a human-like conversational experience, making transactional interactions frictionless. Use artificial intelligence-driven customer intents, natural language understanding models, and pre-built connectors for IVR, online, and mobile channels. With conversational AI and call diversion from higher-cost channels, it provides improved automation at

lower expenses. With targeted recommendations and proactive messaging, it increases revenue.

3.2. U-Trust

WFH remote contact centers enjoy frictionless and continual agent verification. U-Trust provides a faster and richer experience for your supervisors managing WFH agents, without requiring the company to worry about transactional security. U-Trust Agent works by recognizing your agents' individual speech patterns, including behavioral and physiological ones, and automatically authenticating them during their shift. It provides superior WFH agent authentication and administration for a better user experience while maintaining transactional security.

3.3. U-Assist

Uniphore U-Assist automates after-call work (ACW) summaries and call dispositions. It reduces the amount of time spent on ACW to under a minute, resulting in a shorter average handle time (AHT). It helps to deliver more granular results on why consumers call and how to handle those calls to the best by increasing call notation and disposition accuracy. It also helps in improved customer satisfaction (CSAT) and net promoter score (NPS) by integrating AI and automation to provide a more conversational experience. It has reduced ACW time to under a minute, increased call notation and categorization accuracy by up to 80%, and reduced average handle times (AHT) by up to 20%.

3.4. U-Analyze

Uniphore's U-Analyze is used to delve into enormous volumes of recorded client interactions across phone, email, and text to extract actionable information. It helps in improving agent performance and ROI by automating quality management and driving compliance. It is used for reducing the customer churn by uncovering genuine actionable insights from every client engagement. Improved customer conversations using AI by recognizing patterns in conversations, finding themes, and more can be achieved. It also provides actionable insights to the business through post-interaction analytics.

4. Objective and Methodology

The primary goal of this research paper is to comprehend the concept of speech biometric systems, as well as their application and development. Another goal of this research is to do a case study on a leading provider of voice biometric systems. The current security situation is a major topic of discussion around the world especially in the online transactions. As a result, a systematic literature survey and data analysis in the subject of biometrics, particularly in the field of voice biometrics, are discussed. The evolution of technology by several companies in a particular industry is also mentioned. The products and services provided by one such company Uniphore are also discussed.

5. Implementation of Voice Biometric System

5.1. Architecture of Voice Biometric System

Speech activity identification is a critical component of automatic speech recognition systems that affects overall system performance. Many approaches are employed by researchers and corporations to identify voice features from a signal, including LPCC, MFCC, and LPC. For retrieval purposes, the voice recognition biometric system employs a personal voice. Uniphore is a well-known provider of voice biometric systems that help consumers and businesses to safeguard and manage their data. The company provides many solutions like U-Self Serve, U-Trust, U-Assist, U-Analyze. These products expertise in the field of voice biometrics and has resulted in unsurpassed security performance, which has been praised by clients. Uniphore have a dedicated staff working on the progress of numerous sectors such as technical advancement, science, and engineering for the past few years. Uniphore's speech biometric system has attracted a lot of attention since it provides real-time and unique information based on customer expectations. The figure 2 shows the architecture of a voice biometric system.

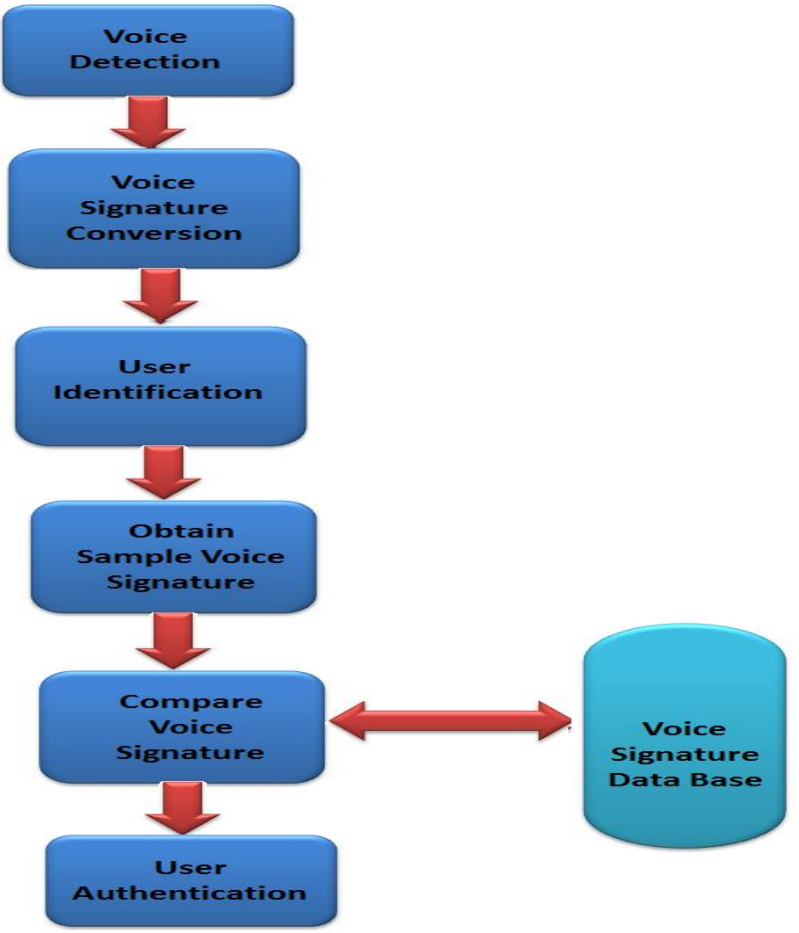

Figure 2: Architecture of Voice Biometrics

5.2. Survey on Existing Biometrics Systems

Biometrics-based authentication has various advantages over other authentication methods, and its use for user authentication has increased dramatically in recent years. When used in security-critical applications, such biometrics-based authentication systems must be built to withstand attacks, especially in unattended distant applications like e-commerce. Various biometrics systems are available in the market. The Table 1 shows a comparison of various biometrics available in the market.

Bio metrics	Uniq uenes s	Perfor mance	Accepta bility	Cost	Size of Template
Signature	Low	Low	High	Low	Small
Finger Print	High	High	Medium	Low	Medium
Face Recogniti on	High	High	High	Medium	High
Retina Scan	High	High	Low	High	High
Voice	Low	Low	High	Low	Medium

Table 1: The comparative studies of different biometric system.

We may compare different biometrics based on their accuracy, cost, template size, stability, and security level. The graphical representation of comparing various biometrics is shown in Figure 3.

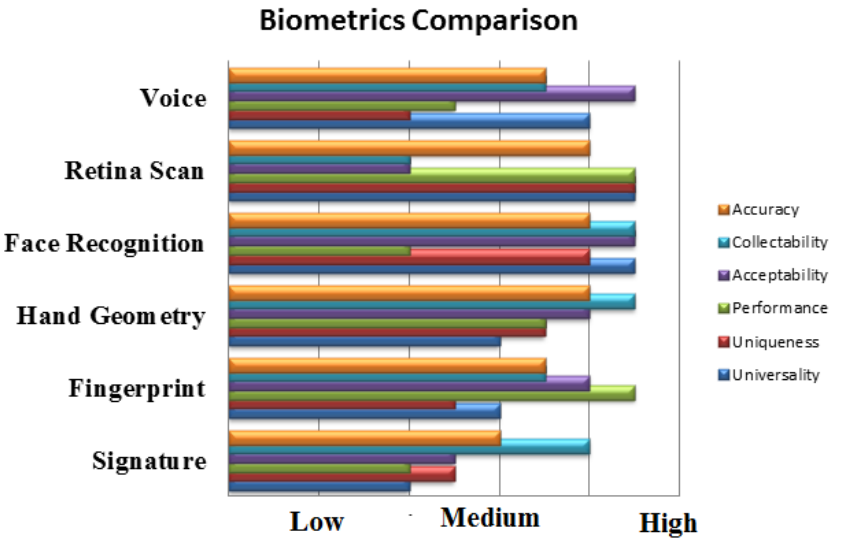

Figure 3: Graphical representation of comparing various biometrics.

It has been demonstrated that biometrics used with facial recognition have the lowest level of accuracy and are also the most expensive. The reason for this is that a photo or video of the same material can unlock the device, allowing anyone with your photo to instantly login and read your data. Iris and retina technologies provide the highest level of protection. Iris, on the other hand, is a costly purchase. The next item on the agenda is voice biometric technology. It is moderately accurate, as well as inexpensive and straightforward to integrate into an existing system. To convert voice commands to machine commands, all we need is a microphone in the user device.

6. Key Features of Voice Biometrics

A set of specified vectors is compared to a set of models from a database in biometric systems. It is a recognition system that extracts vectors from a person's biometric features based on a model. Figure 4 shows the key features of Voice Biometrics.

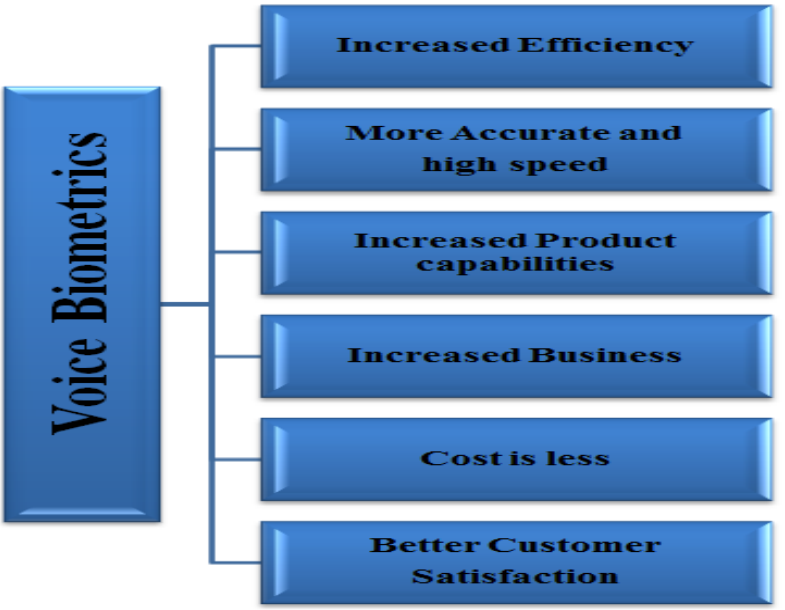

Figure 4: Key features of voice biometrics.

7. Expected Breakthroughs in Biometrics - Market Analysis

The biometrics industry has gained new energy as a result of increasing technology use in the security vertical and the convergence of companies to fulfil authentication criteria. Biometrics technology is increasingly infiltrating consumer, government, and industrial networks now that it has made its imprint throughout the security landscape. Biometrics technology is considered to be less vulnerable to cybercrime and hacking since it is based on the statistical analysis of biological data. According to Global Industry Insights, Inc., the biometrics market will surpass USD 50 billion by 2024, up from USD 12 billion in 2016. Biometrics' widespread acceptance in different verticals, such as mobile banking and other financial services, has aided the market's expansion. As cybercrime and identification errors have captured the attention of industry verticals, biometrics have seen a considerable increase in usage to safeguard data security and privacy.

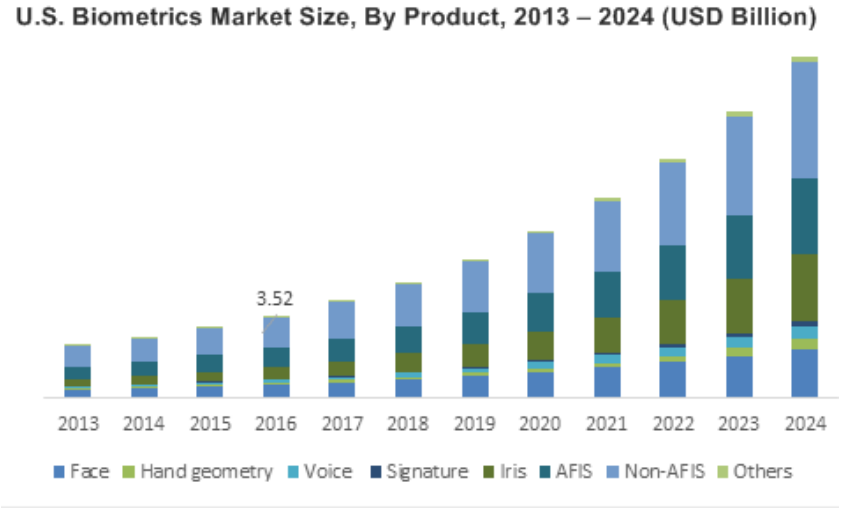

Figure 5. U.S. Biometrics marketsize, By product, 2013-2024(USD Billion)

[Source: www.gminsights.com.]

8. Further Innovation and Improvements

Companies that specialise in voice recognition and gadget development are currently concentrating on market expansion and technological advancement. With the use of smartphones, speech recognition and biometric procedures are slowly capturing all industries. Uniphore, a pioneer in Conversational Service Automation (CSA), has joined the World Economic Forum's (WEF) Worldwide Innovators Community among global leaders such as Idiap Research Institute and Indian Institute of Technology Madras (IITM).

Uniphore, a pioneer in Conversational Service Automation (CSA), has expanded its portfolio with the U-Trust portfolio and the U-Assist Assurance solution. Uniphore customers will be better able to support call centre personnel and operations with these new solutions, while also developing consumer trust and providing a better overall customer experience. Uniphore's new solutions are aimed at improving and optimising contact centre interactions from beginning to end, strengthening the link between front-end customer experience and back-end fulfilment through Robotic Process Automation (RPA), and enhancing contact centre security through agent verification and data security.

9. Conclusion

For human identification and authentication, the voice-biometric system will be the future technology. The popularity of the voice-biometric system has grown as a result of its capacity to identify and verify users from a far because it is text-free. In the topic of voice-biometrics, there is a lot of demand in the market and research. The case study of Uniphore is depicted in this work. This company specializes in voice biometrics and offers voice biometric security solutions.

The company is working on a number of advanced voice recognition and authentication technologies. It provides security solutions to a number of financial institutions, including PNB metlife, Bajaj Alliance, FE CREDIT, and others. The company's most recent growth analysis is also described in this article.

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