**INTRODUCTION**

In this fast moving world, people are ignorant about their health issues and avoid routine check-ups. To solve this problem, we provide voice-based android application to the user where user can interact with system and get inference of diseases and their remedies by giving the symptoms as input. For getting more precise result, we extend our system to generate relevant questions to the user and accordingly provide remedy for problem

**METHODOLOGY**

* 1. .**Voice Assistant:**

The key here is voice. A voice associate is an advanced accomplice that makes use of voice confirmation, talk mix, and everyday language getting geared up (nlp) to offer an enterprise by means of a selected application. Improvement is unremittingly progressing and changing over, and the voice associate market will develop close-with the aid of it. In april 2015, the exam company gartner anticipated that earlier than the of completing of 2020, 50 percentage of affiliation with improvement might be through "talks" with sharp machines, huge amounts of them by means ofstrategiesfor voice.

* 1. **Speech recognition**

Speech recognition is an interdisciplinary subfield of computer science and computational linguistics that develops methodologies and technologies that enable the recognition and translation of spoken language into text by computers. It is also known as automatic speech recognition (ASR), computer speech recognition or speech to text (STT). It incorporates knowledge and research in the computer science, linguistics and computer engineering fields.

Some speech recognition systems require "training" (also called "enrollment") where an individual speaker reads text or isolated vocabulary into the system. The system analyzes the person's specific voice and uses it to fine-tune the recognition of that person's speech, resulting in increased accuracy. Systems that do not use training are called "speaker independent"[1] systems. Systems that use training are called "speaker dependent".

Speech recognition applications include voice user interfaces such as voice dialing (e.g. "call home"), call routing (e.g. "I would like to make a collect call"), domotic appliance control, search key words (e.g. find a podcast where particular words were spoken), simple data entry (e.g., entering a credit card number), preparation of structured documents (e.g. a radiology report), determining speaker characteristics,[2] speech-to-text processing (e.g., word processors or emails), and aircraft (usually termed direct voice input).

**1.3 Text-to-speech (TTS)**

Text-to-speech (TTS) technology reads aloud digital text. It can take words on computers, smartphones, tablets and convert them into audio. Also, all kinds of text files can be read aloud, including Word, pages document, online web pages can be read aloud. TTS can help kids who struggle with reading. Many tools and apps are available to convert text into speech.

Python comes with a lot of handy and easily accessible libraries and we’re going to look at how we can deliver text-to-speech with Python in this article.

**1.4 User** **Module**

* The purpose of this module is to provide the user interface and view functions for the system.
* User registers into the system by giving basic information like name, age etc.
* It also provides communication services between clients of the system and the server by asking questions regarding healthcare.

**1.5 Information Extraction**

Noun Phrase Extraction:

* Noun Phrase Extraction takes into account parts of speech patterns that include a noun . In this stage all the nouns are extracted from given input.
* It is used to remove stop words and it does not take into account the words which are repeated again in a sentence.
* Medical Term Identifier:
* This phase includes extraction of all medical terms.
* For example, spondylolysis is a combination of "spondylo" which means vertebra, and "lysis," which means dissolve, and so means dissolution of a vertebra.
* Depending on the disease symptoms or the medical term, the SVM algorithm can predict the disease.

**Architecture**

**Fig 1.3**:Architecture

**1.2 OBJECTIVE**

Nowadays the Mobile Technology is being very famous for the User Experience ,because it is very easy to access the applications and services from any where of your Geolocation. Android, Apple(IOS),Windows, Blackberry OS,etc. Are various famous and commonly used Mobile Operating Systems. All the Operating Systems provide plenty of applications and services for users.

**1.3 SCOPE OF THE PROJECT**

The quantity of humans using voice assistants is depended upon to make bigger. As shown by means of method for the voice bot exquisite speaker buyer adoption file 2018, legitimate around 10% of folks who don't guarantee an energetic speaker plan to look for one. At the off chance that this ultimate parts regular, the purchaser base of great speaker customers will grow 50 price, which implies that a fourth of developed americaa long way and gigantic will guarantee an excited speaker.

**2.0 RELATED WORKS**

We are still far away from understanding the genuine

capability of speech recognition technology. This applies

both to the refinement of the innovation itself and to its

coordination into our lives. The current digital assistants can

decipher discourse great, yet they are not the conversational

interfaces that the innovation suppliers need them to be.

Besides, speech recognition stays constrained to few items.

Voice recognition technology was around some time before

Apple's Siri appeared in 2011. At the Seattle World's fair in

1962, IBM presented a device called Shoebox.It was the size

of a shoebox and could perform scientific functions and

perceive 16 spoken words as well as digits 0-9.Mozilla are

working on foundations for open, public voice services.

Training a voice assistant takes a lot of data though: 10,000

hours of recordings. To put that in context, the total of all of

the TED talks out there comes to about 100 hours: still 2

orders of magnitude away! That’s why Mozilla have opened

up Project Common Voice to allow the public to lend their

own voices. They created an experiment called Voice Fill to

allow you to search via voice on Google, Yahoo and

duckduckgo. And they have been starting to explore the idea

of open voice service registration under a preliminary name

of Voice HTML.The Lung cancer is a disease of abnormal cells

multiplying and growing into a tumour. Cancer cells can be

carried away from the lungs in blood, or lymph fluid that

surrounds lung tissue. Now several systems are proposed and

still many of them are conceptual design. Artificial Neural

Network based Classification and detection system of lung

cancer [1-2], this system is conceptual and provide poor

accuracy. Computer-aided diagnosis in chest radiography [6]

has classify the lung regions extraction approaches into two

different categories; either rule-based or pixel classification

based category. Automatic detection of small lung nodules on

CT utilizing a local density maximum algorithm [4], it is old

model and provides poor detection. CADs can be divided into

two groups: density-based and model-based approaches [6]. In

some approaches uniformity, connectivity, and position

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artificial neural network and fuzzy clustering methods [3],

presents two segmentation method and Lung Cancer Detection

Using Image Processing Techniques [7-8,11] and Early

Detection and Prediction of Lung Cancer Survival using

Neural Network Classifier [10] have been developed but they

provide poor detection and identification. Lung Cancer

Detection using Curvelet Transform and Neural Network [12],

propose a new technique for LCD identification where

curvelet transform can extract the features of lung cancer CT

scan images proficiently. In recent year, the latest research’s

work are done in the field of lung cancer detection such as

Lung Cancer detection and Classification by using Machine

Learning and Multinomial Bayesian [14], Lung Cancer

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[15], Automatic Detection of Lung Cancer in CT Images [16],

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The word health is an important factor today in everybody’s life. It is the level of functional and metabolic efficiency of a living organism. The use of technology in medical domain has resulted in better and more accessible treatment, improved care and efficiency and disease control. Interactive medical assistant is a voice-based android application which provides handy solutions to users where they can ask query related to health issues. The system allows communication between human and computer by using Natural Language Processing. It consists of a chat-bot where users can ask any query related to health care without being physically present in the hospital. By using Google API for voice-text conversion, query is sent to chat-bot which displays the result on android app.

We are still far away from understanding the genuine capability of speech recognition technology. This applies both to the refinement of the innovation itself and to its coordination into our lives. The current digital assistants can decipher discourse great, yet they are not the conversational interfaces that the innovation suppliers need them to be. Besides, speech recognition stays constrained to few items. Voice recognition technology was around some time before Apple's Siri appeared in 2011. At the Seattle World's fair in 1962, IBM presented a device called Shoebox.It was the size of a shoebox and could perform scientific functions and perceive 16 spoken words as well as digits 0-9.Mozilla are working on foundations for open, public voice services. Training a voice assistant takes a lot of data though: 10,000 hours of recordings. To put that in context, the total of all of the TED talks out there comes to about 100 hours: still 2 orders of magnitude away! That’s why Mozilla have opened up Project Common Voice to allow the public to lend their own voices. They created an experiment called Voice Fill to allow you to search via voice on Google, Yahoo and duckduckgo. And they have been starting to explore the idea of open voice service registration under a preliminary name of Voice HTML.

**2.1 Literature Survey**

# Title: How design process for the Base of the Pyramid differs from that for the Top of the Pyramid

# Authors: [Santosh Jagtap](https://www.researchgate.net/profile/Santosh_Jagtap2), [Andreas Larsson](https://www.researchgate.net/profile/Andreas_Larsson4), [Viktor Hiort](https://www.researchgate.net/profile/Viktor_Hiort), [Elin Olander](https://www.researchgate.net/profile/Elin_Olander)

**Description**: The base (BOP) and the top (TOP) of the world income pyramid represent the poor people and the people from developed countries, respectively. The design of products for the BOP is an important ingredient of the poverty reduction approach that combines business development with poverty alleviation. However, the current understanding of the design for the BOP is limited. This study, using a protocol analysis, compared design processes for the BOP and TOP markets. The results indicate the difference between the design processes for these markets in terms of the design strategy employed by the designers (i.e. problem driven, solution driven strategy), their requirements handling behaviour, and their information behaviour.

**Title**: A wireless PDA-based physiological monitoring system for patient transport

**Authors**: Yuan-Hsiang Lin ; I-Chien Jan ; P.C.-I. Ko ; Yen-Yu Chen ; Jau-Min Wong ; Gwo-Jen Jan

**Description**: This paper proposes a mobile patient monitoring system, which integrates current personal digital assistant (PDA) technology and wireless local area network (WLAN) technology. At the patient's location, a wireless PDA-based monitor is used to acquire continuously the patient's vital signs, including heart rate, three-lead electrocardiography, and SpO/sub 2/. Through the WLAN, the patient's biosignals can be transmitted in real-time to a remote central management unit, and authorized medical staffs can access the data and the case history of the patient, either by the central management unit or the wireless devices. A prototype of this system has been developed and implemented. The system has been evaluated by technical verification, clinical test, and user survey. The evaluation of performance yields a high degree of satisfaction (mean=4.64, standard deviation-SD=0.53 in a five-point Likert scale) of users who used the PDA-based system for intrahospital transport. The results also show that the wireless PDA model is superior to the currently used monitors both in mobility and in usability, and is, therefore, better suited to patient transport.

# Title: A novel emergency telemedicine system based on wireless communication technology

# Authors: Pavlopoulos S, Kyriacou E, Berler A, Dembeyiotis S, Koutsouris D.

# Description: Recent studies conclude that early and specialized prehospital management contributes to emergency case survival. We have developed a portable medical device that allows telediagnosis, long distance support, and teleconsultation of mobile healthcare providers by expert physicians. The device allows the transmission of vital biosignals and still images of the patient from the emergency site to the consultation site using the GSM mobile telephony network. The device can telematically "bring" an expert specialist doctor at the site of the medical emergency, allow him/her to evaluate patient data, and issue directions to the emergency personnel on treatment procedures until the patient is brought to be hospital. Legal reasons mandated the inclusion at the consultation site of a multimedia database able to store and manage the data collected by the system. The performance of the system has been validated in four different countries using a controlled medical protocol and a set of 100 patients per country treated has been collected and analyzed.

# Title: The design of PDA-based biomedical data processing and analysis for intelligent wearable health monitoring systems

# Authors: Pai-Tsun Cheng ; Li-Min Tsai ; Li-Wei Lu ; Don-Lin Yang

# Description: In this paper we present the design of a PDA-based biomedical data processing and analysis system to manage and analyze the biomedical data coming from the smart shirt. We use a PDA equipped with the Bluetooth device to receive signal data in a fixed period. A simple analysis is done to detect abnormality and generate an alert if necessary. Then the signals are transmitted to a back-end server for further processing. The collected data will be stored in a data warehouse and analyzed by using data mining techniques. The purpose of analysis is to provide useful information for users to better understand their health condition and monitor body responses in their daily activities. Doctors can benefit from the real-time patient management of this e-service system as well.

**2.2 Problem with existing system**

# Manual method is people go to hospitals which sometimes may not be convenient due to lack of time or missed appointments. Also there are many online websites where people can get health related queries. But they may not be as intelligent due to limited subject vocabulary.These websites do not provide accurate remedies to the user, they list up all the possible diseases, even if the probability of the disease is very low.Hence, this is a time consuming process where user has to spend more time online, seeking for their health information.

**3.0 PROPOSED SYSTEM**

# The aim of proposed system is to increase health awareness among the people through the answer provided by the system to the users question. This system accepts health related queries in voice format rather than text format. It identifies the disease and prescribes medicine based on the symptoms mentioned by the user.

**4.0 SYSTEM DESIGN**

**4.1 Introduction to Uml**

**4.1.1 Uml Design**

Unified Modeling Language (UML) is a general purpose modelling language. The main aim of UML is define a standard way to visualize the way a system has been designed. It is quite similar to blueprints used in other fields of engineering.UML is not a programming language, it is rather a visual language. We use UML diagrams to portray the behavior and structure of a system. UML helps software engineers, businessmen and system architects with modelling, design and analysis. The Object Management Group (OMG) adopted Unified Modelling Language as a standard in 1997. Its been managed by OMG ever since. International Organization for Standardization (ISO) published UML as an approved standard in 2005. UML has been revised over the years and is reviewed periodically.

**4.1.2 Uses of UML**

UML, the unified modeling language, is a standard used to visually describe a program, specifically an object-oriented program. UML helps to organize, plan and visualize a program. In addition, being a standard, it is widely used and accepted as the language for outlining programs. UML is used in a variety of purposes and its readability and re-usability make it an ideal choice for programmers.

**Visual Representation**

A UML diagram is a visual representation of the relationships between classes and entities in a computer program. A class is an object in programming that organizes similar variables and functions in one location. To understand a program, it is essential to understand what each class object does, the information it stores and how it relates to other classes in the program.

## Readability and Re-usability

A UML diagram is beneficial in that it is very readable. The diagram is meant to be understood by any type of programmer and helps to explain relationships in a program in a straightforward manner. Traditionally, to understand a program, a programmer would read the code directly. This could be thousands or millions of lines of code in very large programs. Having a UML diagram helps to quickly illustrate those relationships. Additionally, by using a diagram to show the code running in a program, a programmer is able to see redundant code and reuse portions of code that already exist rather than rewrite those functions.

**4.2 UML Diagrams**

**4.2.2 Class diagram**



**Fig 4.2:** Class diagram

EXPLANATION:

A class diagram in the UML is a type of static structure diagram that describes the structure of a system by showing the system’s classes, their attributes, and the relationships between the classes. Private visibility hides information from anything outside the class partition. Public visibility allows all other classes to view the marked information. Protected visibility allows child classes to access information they inherited from a parent class.

**4.2.3 OBJECT DIAGRAM**

An **object diagram** in the Unified Modeling Language (UML) is a diagramthat shows a complete or partial view of the structure of a modeled system at a specific time.

An Object diagram focuses on some particular set of object instances and attributes, and the links between the instances. A correlated set of object diagrams provides insight into how an arbitrary view of a system is expected to evolve over time.

Object diagrams are more concrete than class diagrams, and are often used to provide examples, or act as test cases for the class diagrams. Only those aspects of a model that are of current interest need be shown on an object diagram.



**Fig 4.3**: Object diagram

**4.2.4 STATE DIAGRAM**

A state diagram is a type of diagram used in computer science and related fields to describe the behavior of systems. State diagrams require that the system described is composed of a finite number of states.



**Fig 4.4:** Statechart diagram

**4.2.5 SEQUENCE DIAGRAM**

A sequence diagram in UML is a kind of interaction diagram that shows how processes operate with one another and in what order.It is a construct of a message sequence chart. Sequence diagrams are sometimes called Event-trace diagrams, event scenarios, and timing diagrams.



**Fig 4.5**: Sequence diagram

**4.2.6 ACtivity diagram**



**Fig 4.6:** Activity diagram

EXPLANATION:

Activity diagram are a loosely defined diagram to show workflows of stepwise activities and actions, with support for choice, iteration and concurrency. UML, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. UML activity diagrams could potentially model the internal logic of a complex operation. In many ways UML activity diagrams are the object-oriented equivalent of flow charts and data flow diagrams (DFDs) from structural development.

**4.3 REQUIREMENTS SPECIFICATION**

**4.3.1 Hardware Requirements**

The hardware requirements may serve as the basis for a contract for the implementation of the system and should therefore be a complete and consistent specification of the whole system. They are used by software engineers as the starting point for the system design. What the system do and not how it should be implemented.

System : Pentium IV 2.4 GHz.

Hard Disk : 40GB.

Floppy Drive : 2mb

Monitor : 15VGA Color.

Ram : 512MB

**4.3.1 Software Requirements**

The software requirements document is the specification of the system. It should include both a definition and a specification of requirements. It is a set of what the system should do rather than how it should do it. The software requirements provide a basis for creating the software requirements specification. It is useful in estimating cost, planning team activities, performing tasks and tracking the teams and tracking the team’s progress throughout the development activity.

Operating system : Windows7 SP1,8,8.1

IDE : spyder

Coding Language : python

**5.0 IMPLEMENTATION**

**CANCER.PY**

**7.0 CONCLUSION**

The proposed system is a voice-based android medical assistant that aims to increase health awareness among people through the answers provided by the system to the users question. The high response capability and fast processing are the key features of the system. The system uses Natural language processing techniques to provide precise remedy to the users medical problem. The remedies suggested by the system include remedies for the mentioned symptom or diseases by the user.

**8.0 FUTURE SCOPE**

In future, a system that relies on deep learning, a neural network that enables the system to match a submitted photo of an injury with avast database of iconic images from specialized websites. User can be recommended through the system for specific medical test for the aforementioned symptoms or diseases. Also, a reminder of medicine timings can be given to the user.

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