Abstract

Artificial intelligence (AI) is now a days increasingly being used in healthcare. Here, AI-based chatbot systems can act as automated chat bot sysytem, capable of abet health, providing education, and potentially prompting behaviour change. Exploring the motivation to use health chatbots is required to predict intake; however, few studies to date have blow their acceptability. This research aimed to explore participants' willingness to engage with AI-based health care chatbots. With India's growing population, rising birth rate, and declining death rates due to advances in the medical field have found that the numbers of doctors have dwindled to meet the growing demand for the population. This situation can be better understood when we travel to cities in public hospitals where low availability of doctors is a major cause of improper treatment of patients and in some cases the resulting death. Sometimes even doctors can make the mistake of providing appropriate treatment results in a patient's death. To deal with such cases there is a need for a smart chatbot and Intelligent that can give advice to doctors and sometimes even patients about what to do in such situations that ultimately lead to the saving lives of hundreds of people. A situation because sometimes doctors can make a mistake while looking for symptoms but a specially designed machine cannot make such a mistake. This AI-based medical discussion can make a decision based on the patient's request. In this case, it uses its own database and in somecases where something is not available in its database at the request of the user, it collects information from a search engine like Google and provides it to the user in Audio format as Google does.

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Chapter

1. **Preamble**
    a. **Introduction**

        Healthcare is very important to lead a good life. However, it is very difficult to obtain a consultation with a doctor for every health problem. The idea is to create a medical chatbot using Artificial Intelligence that can diagnose the disease and

provide basic details about the disease before consulting a doctor. This will help to reduce healthcare costs and improve accessibility to medical knowledge through medical chatbots. Chatbots are computer programs that use natural language to interact with users. The chatbot stores the data in the database to identify the sentence keywords and make a query decision and answer the question. Ranking and sentence similarity calculations are performed using n-gram, TFIDF and cosine similarity. The score will be obtained for each sentence from the given input sentence and more similar sentences will be obtained for the query given. The third-party, the expert program, handles the question presented to the bot that is not understood or is not present in the database.

b. Problem Statement

People are facing difficulty in finding a good doctor , a lack of insurance coverage, nursing and physician shortage, a different perspective on solving the shortage crisis, So Artificial intelligent chatbot is a technology that makes interactions between man and machines using natural language possible.

2. System Design

3. SRS

3.1 Functional Requirements:

Hardware Requirements

- I3 Processor Based Computer or Higher
- Min 10 GB HDD
- RAM 512 MB or Higher
- 2.4 GHz or faster Processor
- Internet Connection

Software Requirements

- Windows Vista onwards, Linux, Mac OS
- Notepad++
- Google Chrome Browser
- In the case of building the Project from the source
    - Python Compiler
    - Tensorflow Machine learning library
    - Keras
    - SciKit Learn
    - Pandas
    - Numpy
    - Flask

3.2 Non Functional Requirements:

Performance Requirements:

- The formats of the scanned copies should be in the standard format
- Should have a training error of as low as possible

Software Quality Attributes

- Robustness
- Reliability
- Better learning methods
- Acquiring good accuracy results

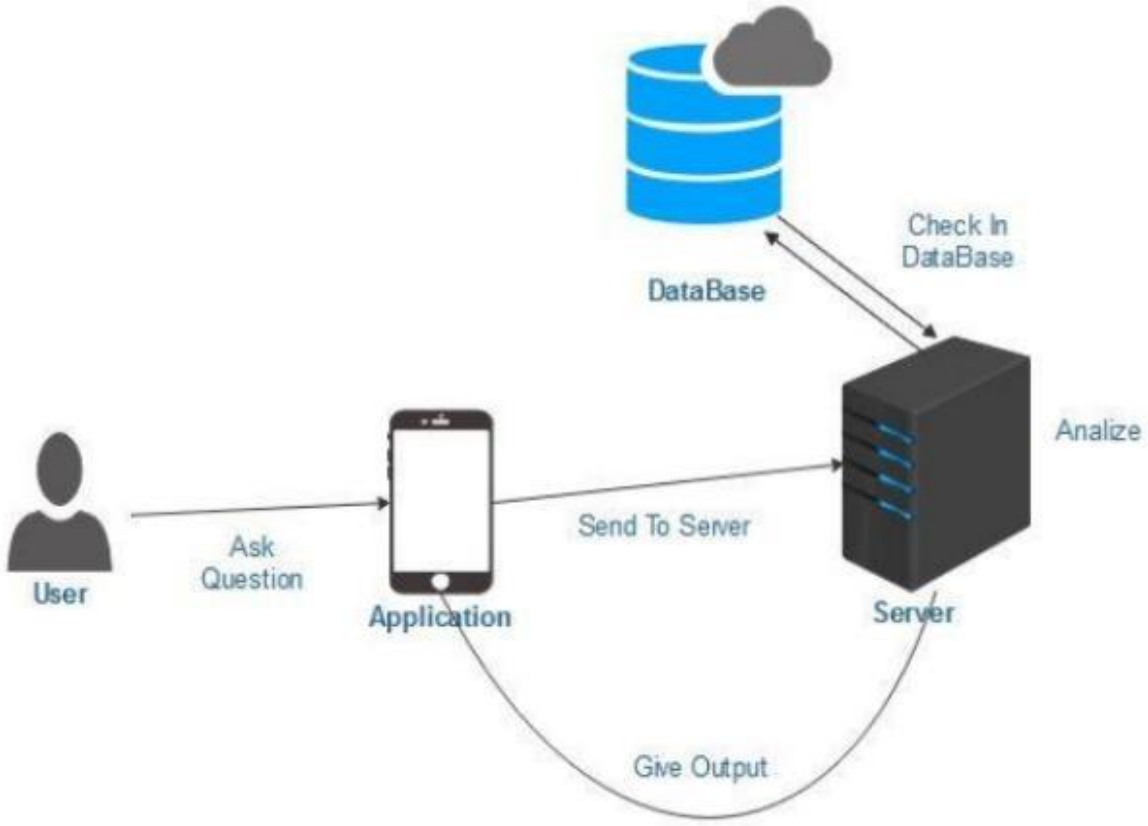
4. Implementation / Methodology

I. AES:- The Advanced Encryption Standard (AES) is a symmetric block cipher chosen by the U.S. government to protect classified information. AES is implemented in software and hardware throughout the world to encrypt sensitive data. It is essential for government computer security, cyber security and electronic data protection. AES has been adopted by the U.S. government and is now used worldwide. It supersedes the Data Encryption Standard(DES), which was published in 1977. The algorithm described by AES is a symmetric-key algorithm, meaning the same key is used for both encrypting and decrypting the data. AES is based on a design principle known as a substitution–permutation network, and is efficient in both software and hardware. Unlike its predecessor DES, AES does not use a Feistel network. AES is a variant of Rijndael, with a fixed block size of 128 bits, and a key size of 128, 192, or 256 bits. By contrast, Rijndael per se is specified with block and key sizes that may be any multiple of 32 bits, with a minimum of 128 and a maximum of 256 bits.

II. Hashing and mapping:- A hash function is any function that can be used to map data of arbitrary size to fixed-size values. The values returned by a hash function are called hash values, hash codes, digests, or simply hashes. The values are used to index a fixed-size table called a hash table. Use of a hash function to index a hash table is called hashing or scatter storage addressing. A map is a symbolic depiction emphasizing relationships between elements of some space, such as objects, regions, or themes. Many maps are static, fixed to paper or some other durable medium, while others are dynamic or interactive. Although most commonly used to depict geography, maps may represent any space, real or fictional, without regard to context or scale, such as in brain mapping, DNA mapping, or computer network topology mapping. The space being mapped may be two dimensional, such as the surface of the earth, three dimensional, such as the interior of the earth, or even more abstract spaces of any dimension, such as arise in modeling phenomena having many independent variables.

We are making a system with the help of artificial intelligence and machine learning, our system is based on the hospital managements, Each user has to login to the system to use it, we are providing a chatbot for hospitals which will perform operation like appointment booking, surgeon information, doctor

presence etc. we making a smart system that will allows user to get overall information of hospital in finger tips. Through chatbots one can communicate with text or voice interface and get reply through artificial intelligence. Typically, a chatbot will communicate with a real person. Chat bots are used in applications such as ecommerce customer service, call centers and Internet gaming. Chatbots are programs built to automatically engage with received messages. Chatbots can be programmed to respond the same way each time, to respond differently to messages containing certain keywords and even to use machine learning to adapt their responses to fit the situation. A developing number of hospitals, nursing homes, and even private centers, presently utilize online Chatbots for human services on their sites. These bots connect with potential patients visiting the site, helping them discover specialists, booking their appointments, and getting them access to the correct treatment. In any case, the utilization of artificial intelligence in an industry where individuals' lives could be in question still starts misgivings in individuals. It brings up issues about whether the task mentioned above ought to be assigned to human staff. This healthcare chatbot system will help hospitals to provide healthcare support online 24 x 7, it answers deep as well as general questions. It also helps to generate leads and automatically delivers the information of leads to sales. By asking the questions in series it helps patients by guiding what exactly he/she is looking for.



5. **Software Testing**

   The research in this thesis focuses on predicting the general sentiment polarity of the reactions to the news on Twitter/Reddit before a news article is published. To answer our research questions regarding the influence of category of product acceptance

6. **Code**

```
######## A
Healthcare
Domain
Chatbot to
simulate
the
predictions
```

of a
General
Physician
########

```
######## A pragmatic Approach for Diagnosis ############

# Importing the libraries
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd

# Importing the dataset
training_dataset = pd.read_csv('Training.csv')
test_dataset = pd.read_csv('Testing.csv')

# Slicing and Dicing the dataset to separate features from predictions
X = training_dataset.iloc[:, 0:132].values
#print(X)
y = training_dataset.iloc[:, -1].values
#print(y)

# Dimensionality Reduction for removing redundancies
dimensionality_reduction =
training_dataset.groupby(training_dataset['prognosis']).max()
#print(dimensionality_reduction)

# Encoding String values to integer constants
from sklearn.preprocessing import LabelEncoder
labelencoder = LabelEncoder()
y = labelencoder.fit_transform(y)
#print(y)

# Splitting the dataset into training set and test set
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.25,
random_state = 0)

# Implementing the Decision Tree Classifier
from sklearn.tree import DecisionTreeClassifier
classifier = DecisionTreeClassifier()
classifier.fit(X_train, y_train)

# Saving the information of columns
```

```
cols     = training_dataset.columns
cols     = cols[:-1]


# Checking the Important features
importances = classifier.feature_importances_
indices = np.argsort(importances)[::-1]
features = cols

# Implementing the Visual Tree
from sklearn.tree import _tree

# Method to simulate the working of a Chatbot by extracting and formulating
questions
def execute_bot():

print("Please reply with yes/Yes or no/No for the following symptoms")
def print_disease(node):
#print(node)
node = node[0]
#print(len(node))
val  = node.nonzero()
#print(val)
disease = labelencoder.inverse_transform(val[0])
return disease
def tree_to_code(tree, feature_names):
tree_ = tree.tree_
#print(tree_)
feature_name =
[feature_names[i] if i != _tree.TREE_UNDEFINED else "undefined!"
for i in tree_.feature
]
#print("def tree({}):".format(", ".join(feature_names)))
symptoms_present = []
def recurse(node, depth):
indent = "  " * depth
if tree_.feature[node] != _tree.TREE_UNDEFINED:
name = feature_name[node]
threshold = tree_.threshold[node]
print(name + " ?")
ans = input()
ans = ans.lower()
if ans == 'yes':
```

```
val = 1
else:
val = 0
if val <= threshold:
recurse(tree_.children_left[node], depth + 1)
else:
symptoms_present.append(name)
recurse(tree_.children_right[node], depth + 1)
else:
present_disease = print_disease(tree_.value[node])
print( "You may have " +  present_disease )
print()
red_cols = dimensionality_reduction.columns
symptoms_given =
red_cols[dimensionality_reduction.loc[present_disease].values[0].nonzero()]
print("symptoms present  " + str(list(symptoms_present)))
print()
print("symptoms given "  +  str(list(symptoms_given)) )
print()
confidence_level = (1.0*len(symptoms_present))/len(symptoms_given)
print("confidence level is " + str(confidence_level))
print()
print('The model suggests:')
print()
row = doctors[doctors['disease'] == present_disease[0]]
print('Consult ', str(row['name'].values))
print()
print('Visit ', str(row['link'].values))
#print(present_disease[0])
recurse(0, 1)
tree_to_code(classifier,cols)



# This section of code to be run after scraping the data

doc_dataset = pd.read_csv('doctors_dataset.csv', names = ['Name',
'Description'])


diseases = dimensionality_reduction.index
diseases = pd.DataFrame(diseases)
```

```
doctors = pd.DataFrame()
doctors['name'] = np.nan
doctors['link'] = np.nan
doctors['disease'] = np.nan

doctors['disease'] = diseases['prognosis']


doctors['name'] = doc_dataset['Name']
doctors['link'] = doc_dataset['Description']

record = doctors[doctors['disease'] == 'AIDS']
record['name']
record['link']




# Execute the bot and see it in Action
execute_bot()
```

7. Conclusion

It determined that the modern chatbots perform at a very high standard to provide a reliable response to users compared to the traditional chatbots. Unlike existing chatbots which focused on various domains of healthcare. This is the best solution for people who are busy with their job schedules. They do not need to wait in the queue for hours to get an appointment with a doctor every time instead they can chat with the bot.

8. References

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