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MedWise: Your Healthmate

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Abstract – *This paper is about a medical assistant chat bot that will help cure chronic diseases by suggesting appropriate medicines. It includes information about artificial intelligence and its relativity in contemporary times. Furthermore, the description about the web application developed is mentioned. Research and charts about associated fields such as technologies, architecture and healthcare are cited as well. The field of artificial intelligence is expanding rapidly and in context to that, it has become extremely important for Gen Z to study and analyze about it, especially the domain professionals. When the question is about personal assistants, we have many which come as an integrated part of variety of devices; Cortana for Windows, Siri for iPhone and Google Assistant for Android. In healing art, artificial intelligence and machine learning have made their way towards advanced and precise equipment's and machinery. AI has put up a massive scope of achieving things that once were just visionary.*

Key Words: **Artificial Intelligence, Machine Learning, Decision-Tree, algorithms, database, future scope, technologies.**

Abbreviations: **AI – Artificial Intelligence, ML – Machine Learning, JS – JavaScript, XAI – Explainable Artificial Intelligence.**

1. INTRODUCTION

Health and Hygiene are considered as the most important factors when it comes to a satisfied and disease-free life. During the times of COVID-19, availability of open medical stores was less and doctors found it difficult to attend patients without the covid symptoms. The medicines were available however, due to lockdowns being declared all around the world, it became seemingly difficult to treat diseases like viral fever. Individuals suffered the most. Our project idea evolved from this aspect. In this, we decided to use the very famous field of study i.e., Artificial intelligence to solve this problem by developing an assistant chat bot that will help the individuals and people at times of adversity. The system of this software / web application is a 6-phase system which helps it to perform at its level best. Machine learning, a subset of the renowned AI aided us with algorithms and programming skills that made it possible to achieve the goal. Even though the software currently manages to solve the problem on a lower level, there includes tonnes of potential areas where optimizations can be made and many new features can be added.

1.1 Artificial Intelligence Today

The history of AI dates way back to World War 2 when it was about finding ways to disconnect German Communication endpoints. Thereafter, just based on the one question 'Can machine think?' proposed by Alan Turing, we see the wonders of AI in all of the other fields of study today. Artificial Intelligence is expanding rapidly in the fields of finance, research, economy, healthcare, logistics, manufacturing, automobiles, computers, gaming, retail, and marketing.

Besides this, AI has made its growth in many countries all over the globe. The unique feature of AI that makes it stand out from its relative competitive technologies is its optimal scalability as knowledge can just keep evolving in this field. Machine learning, deep learning and neural networks are developing at a much faster pace compared to 90's and is helping various business flourish. Extreme human labor has reduced in a considerable amount allowing 24x7 services at many places.

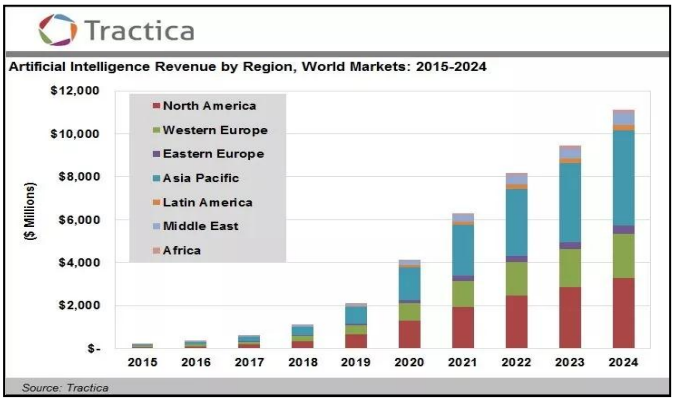

Chart – 1: Artificial Intelligence Revenue in World Market

1.2 Software Overview

The main role of this project was to help user get the best medicine suggestion possible in emergency cases. The results are personified and filtered based on user preferences. In this case we have considered the responses received from the user as the bases of generating the results. The user can select any option or type in anything and if the algorithm finds out the relevant searches, then, the process of iterating through dataset begins. Once user is done with

entering the symptoms, the bot finally suggests the medicine which can relieve the user.

An image / prototype has been provided to gain better insight of the development: -

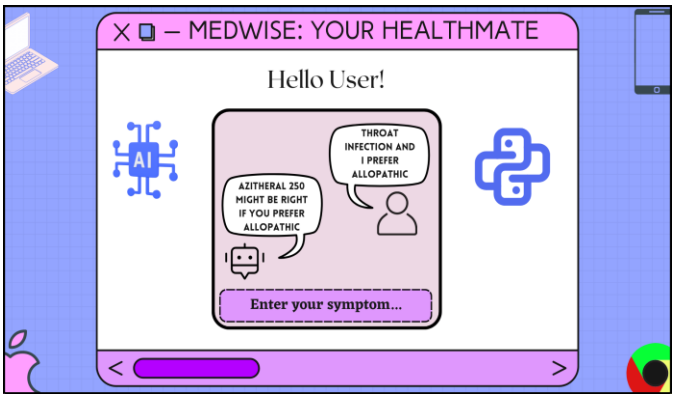

Fig. 1: Project Prototype.

Thus, as depicted, user will enter the symptom and the bot will respond with the information and result it was able to generate.

Case: The user is suffering with viral flu.
Question: 1) The bot will ask which medicine type the user prefers.

2) The bot will ask if the user experienced it recently.

3) Then questions about: places been to, throat pain? Chest pain and similar questions asked.

The goal here is to provide a personalized consultant like feel so that user feel not feel intimidated at any point of due course.

2. AI in Healthcare today

Especially in the market of USA, AI is being used to extensively treat high level diseases. Studies also show that the effect of these have been rather efficient and reliable, too. Besides that, other European countries have also inculcated the discipline of AI in various healthcare sub sectors. Before this, there always remained a question in the minds of people about the trust and reliability about the use of AI for treatment. However, transparency was developed by explainable artificial intelligence [XAI]. The data that is present in the field of health and sciences is far larger, compared to other industrial sectors. The maintenance, suggestions and sorting of this data has become relatively very simple with the boom of AI in the market today. Remedy and research for variety of diseases was possible due to features of AI.

The graph below shows the use of this great field in the many sides of medical which is growing rapidly as new progress is being made.

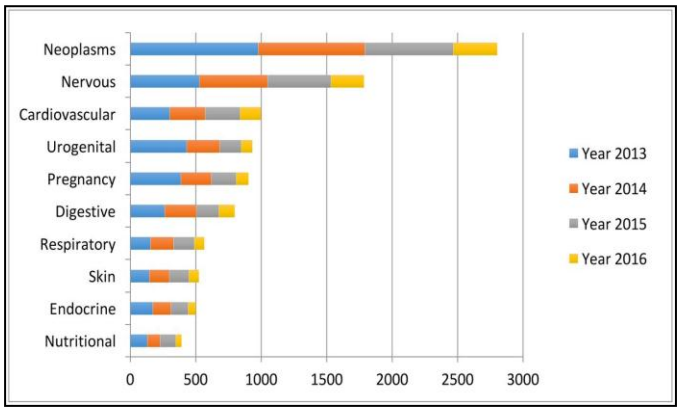

Chart -2: Artificial Intelligence in medical field: Yesterday, Today and Tomorrow

3. Technologies Used

This project was developed by using the combination of various technologies, languages and algorithms which made it to where the optimum functionality was achieved.

3.1 Python - Flask

Python is an open source, extensible, scalable, and heavy processing capable programming language that we used to develop the backend of our application. As it supports these features and multi-processed computing, choosing this language for using ML algorithmic implementation was surely the best choice we could make. With reference to that, the very popular framework of Python i.e., Flask was used. This is a micro-framework that help the process of developing web related application easy and hard-code free.

3.2 JavaScript

Though JS is a scripting language, by observing the high demand for it in the market, this was the best option we chose. JS supported various important and required features with reference to our project; light-weight and client side – because python was already occupying a large memory space on the back-end. JS was used to develop the UI and front-end of the application. Though integration with Python was a bit more complicated, it was managed using flask as mentioned earlier.

4. Machine Learning [Project Aspect]

Machine learning is the most important feature to be observed for in this project as the program continues to learn and grow its word stash with user's decisions and choices. The decision-tree algorithm is used in context to searching

out for the particular and specific medicine in association to the illness suffered by user.

The segregation and management of this is made in the backend as follows:-

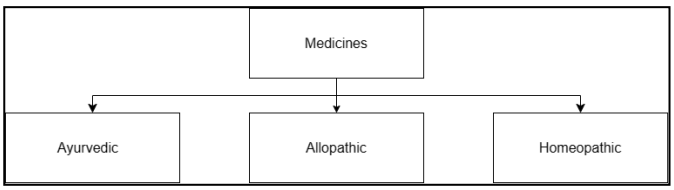

Fig. 2: Medicinal Tree Structure.

5. System Architecture

The architecture developed was simple and in 3-tier format. However, to simplify the development process it was split up into 6 phases: -

Phase 1: -

In phase 1, there are 2 modules. Each is responsible for its own role. User experience will include the standard animation and smooth transition that need to be coded as per desire. Whereas, the elements are the ones user will interact in order to enter / login / see data.

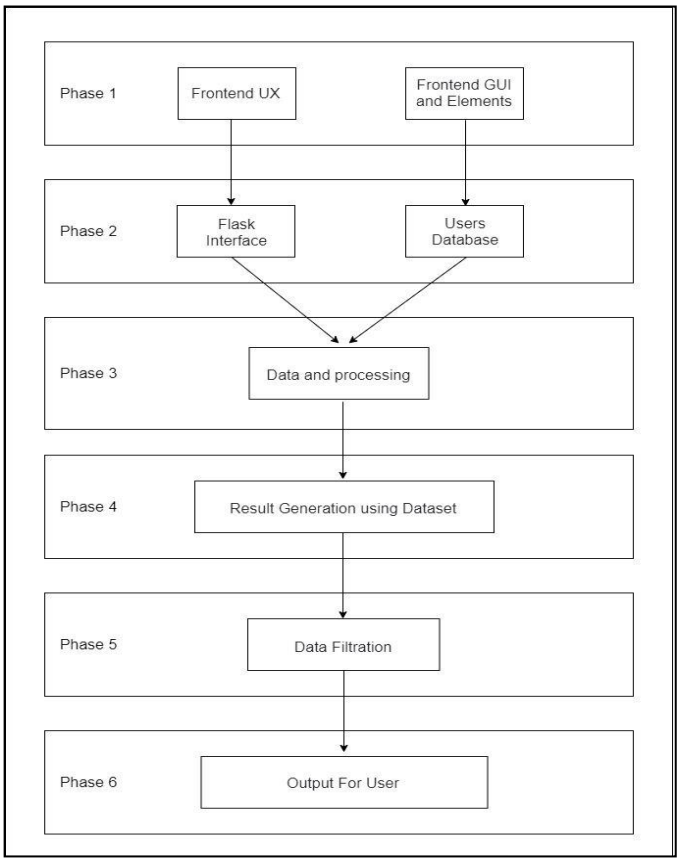

Fig. 3 The system architecture.

Phase 2: -

Flask is a python framework, especially designed to work with web framework and create AI applications. The libraries act as a well-developed interface. The user's database will contain the information that is necessary for user to log in to application and enter / interact with bot.

Phase 3: -

This includes the algorithms that will be used to process the data that will be taken from the user in order to generate and output in the future phases.

Phase 4: -

This includes a module which is solely responsible to generate the visible output to the user, but not yet show it, instead forward it to processing / filtering.

Phase 5: -

This is the most important module wherein, the data about medicines that was generated, will be filtered based on users answers or queries asked.

Phase 6: -

The actual visible output for the user will be generated, styled, and given in this module and phase of the application.

6. Future Scope

This project is made to where medicines for simple pains, acupressure and viral diseases and flu's can be suggested. However, on a much larger scale, by including report scanning, eye scan, vital scanning, and taking in data for blood information, we can make this bot a fully functional consultant. The medicines used are very few due to non-cost-effective API's. However, if APIs are integrated many more types and variants of medicines can be included. A provision has also been made wherein, the developer can include the doctors and medical professionals nearby as a part of full body checkup or treatment consultation for severe diseases. Thus, potential scope in this bot is extremely high.

CONCLUSION

Artificial Intelligence is a real-time problem solving, interesting and feature full domain of study. With the knowledge one can build application that can solve social / official purpose. From the research and development of the project, we found out that AI can be integrated with many languages thus making it available for multipurpose usage. AI projects such as chatbots and analytical data tracker are being developed and used in many industries to avoid extreme and repetitive labor. As it is a developmental field,

researchers and developers find it difficult to implement, but as its important to keep it progressive, programming continues. As AI and ML continues to grow, the project's mission objective was to use the maximum possible knowledge of these fields to develop an application helpful to society

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