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Smart Health Consulting and Online Health Shopping Portal with Product Recommendation System

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Abstract: *Healthcare industry has become a big business. The healthcare industry produces large amounts of healthcare data daily that can be used to extract information for predicting diseases that can happen to a patient using health data. There are many tools related to disease prediction. But generally, there are no such tools that are used for the prediction of general diseases. So this system helps for the prediction of general diseases with great accuracy. As the demands for herbs and natural medication rose due to the recent outbreak. With that, an enormous amount of fake information is being passed on the internet. Lack of a centralized database of a person, and because of that, it is impossible to take proper precautions for the prevention of any viral disease. One cannot take proper care of themselves without a doctor's consultation. And visiting a doctor frequently is neither efficient nor affordable.*

Keywords: HealthCare, Django, Naïve Bayes, Herbs

I. INTRODUCTION

The COVID-19 epidemic has affected hospitals worldwide. Many hospitals have reduced or reversed non-emergency care. This has health consequences for people who are provided by hospitals, and there are financial consequences for hospitals. Health and social systems around the world are struggling to cope. The situation is particularly acute in humanitarian, fragile, low-income areas, where health and social systems are already weak. Health facilities in many areas shut down or reduce resources. [1] Services for the provision of sexual and reproductive health care have been set aside, leading to higher maternal mortality and morbidity.

Many people in India are dying during the COVID-19 pandemic, but not just because of the coronavirus. Experts say that one reason may be that people with certain ailments may not be inclined to seek help.

This result comes from a new study showing that deaths are increasing due to causes such as heart attack, stroke, diabetes and other common diseases - while emergency room visits in those cases are low.

"Infodemic" is defined as "an abundance of information - some accurate and some inaccurate - that occurs during an epidemic". This paper describes the infodemic features, which include the highest volume of information (leading to information-related issues, final volume, quality assurance, visibility, and legitimacy) and immediate exit (making it difficult to evaluate its value, manage gate maintenance process, apply results, traced its history, and led to the waste of effort). This is accompanied by the protective growth of inaccurate information, unintentional information, and inaccurate information. Solutions to the problems posed by infodemic will be sought in advanced technology and transformed by social and regulatory frameworks. One solution could be a trusted new domain of high quality health information. The World Health Organization has so far made two unsuccessful attempts to build such a base, but it is suggested that this may be tried again, thanks to the COVID-19 infodemic experience. The important role of reliable information in public life should also be clearly recognized in the Sustainable Development Goals, which are clearly defined. All countries should make arrangements to prepare for future emergency information.

As a contribution to understanding the broader role of knowledge in health development, this paper outlines the role of a smart health portal to overcome some of the issues mentioned above. A website with information on Indian herbal remedies available in the market. Predictability module and Purchase module for licensed retailers and customers to purchase and sell their products.

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II. METHODOLOGY

2.1 Proposed System

The proposed solution covers three main stages:

1. Web application development as well
2. Predicting disease by machine learning
3. Online Health Shopping Portal.

A web application that allows the user to interact with the system while the disease forecast system is used to predict the disease based on the given indicators. The forecast system is based on the integration system using Naive Bayes. The back-end is built in the language of the python program with the support of the Django framework. Frontend and backend are also connected to the database used by SQLite.

The next section presents a detailed description of the entire system.

A. Web Development

The web application is designed with a module so that the user can interact with the platform.

The web application consists of two main components:

- Front-End (advanced on JavaScript and HTML)
- Back-End (highly developed in Python)

The web application offers the following features:

- Login and registration system - provides registration and login services.
- Predicting disease based on symptoms - helps people predict their illnesses by selecting symptoms from the list provided on the platform.
- A list of fruits and herbs is recommended for the user based on such a disease recommended.
- User can add the recommended product to the cart and purchase the same by setting command.

B. Machine Learning Predictability

This program focuses on simplifying the process of predicting diseases that are often time-consuming and require the knowledge of a competent physician. We have provided a plan in which we can predict a person's disease from the symptoms they are experiencing. This will be useful for those looking for help online. Time to rush to hospitals can be avoided with this. Many ML algorithms can produce results if used alone in this system using Naïve Bayes. The database used has about 5000 records with 132 symptoms and 43 diseases. Data cleaning and data reduction is done in the database to avoid overcrowding, algorithms are used and finally, the model predicts the most likely disease.

The model used:

- **Naïve Bayes Algorithm:** The Naive Bayesian classifier is based on a theory called Bayes' theorem it takes independence among the forecasters. The Naive Bayes model is easy to build, there is no sophisticated measurement of the recurring parameter that makes it usable for very large data sets. The Naive Bayesian classifier is a simple algorithm, yet it usually performs well and is it is widely used because it often exceeds complex classification methods. It uses Bayes theory with a strong assumption of independence between the elements in order to get results.
- **Bayes Theorem:** Bayes theorem operates on conditional conditions. Conditional Chances are it depends on what happened and then takes over something will happen based on what happened before. Conditional opportunities provide event opportunities using their prior knowledge.

Conditional opportunities: -

$P(A \mid B) = P(B \mid A) .P(A) / P(B)$

There,

P (A): The probability of a hypothesis being true and known as pre-existing probability.

P (B): Opportunities for evidence.

P (A | B): Evidence of the evidence provided that the hypothesis is true.

P (B | A): Possibility of hypothesis given that the evidence is true.

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Benefits -

1. It is easy and very useful for large dataset.
2. It can be used for both binary split problems and multiple categories.
3. Requires a minimum amount of training data.
4. It can make possible predictions and can handle both continuous and clear data.

C. Online Health Shopping Portal.

The E-Commerce website is a site used to make business deals on a large scale across the network. Here at our project, we create a new type of website where we offer options to local customers and retailers such as buying, and selling Indian Herbs.

E-commerce is an explosion of modern business. Instead, e-commerce is more than just a means to an end. It leads to a complete transformation of the traditional way of doing business. Purchasing goods and services through E-Commerce allows consumers the freedom to choose when and where to buy and the opportunity to research a product, retailer, and any other available options. Purchases are encouraged to access online information.

The E-Commerce business approach has many advantages remembering the status of COVID-19. As we know that due to covid the situation in India worsened due to the closure of places and arrival times that existed across the country. This has led to a decline in profits for businesses that are self-employed or offline. But thanks to the advancement of technology especially e-commerce this loss has turned into a profit and it sounded like no existing situation.

The e-commerce website to be developed was a difficult task as it contained many limitations that needed to be taken care of. Website contains front, backend, and website. The complete work was divided into three phases as mentioned above. First we have upgraded the front end as the user will only use the end panel and does not care about the back end and the site. So the biggest challenge was the good looking front. Then we move on to the last back and sequence to the database.

III. System Planning

1. Coding (HTML, CSS3, Python, Bootstrap)
2. Frame (Django - python)
3. User module
4. Product Module
5. SQLite website

- **Coding:** The E-commerce website is made with writing languages such as HTML, CSS3, Python, and Bootstrap. This vernacular makes the website even more attractive and usable and easy to use and purchase. Tongue languages help to make things more attractive and imaginative.
- **Html:** HTML is a HyperText Markup Language. A web designer can separate the title, body text, and sidebar of a web page by placing each in a different cell. Additionally, the network designer can place each link button in a separate header and bar in a separate cell so that they can define different features of each button. Then, within the body of the page, the web designer can separate text and image elements into different cells to control space and individual elements.
- **CSS3:** CSS can be the formatting language that you want to add style to your page. This can be done by having the CSS document linked to your HTML page. This page then has selections and features that affect the tags within your Html document. CSS was launched in 1996. It is designed to prevent people from repeating multiple codes. For example, if someone wants to change the text of a paragraph, they should always be quiet when they want to change features. CSS has become accustomed to having many features, for example, we will now use tools and convert the background into a larger color scheme.
- **Python:** There are basically two frameworks for Python backend web development. They are Django and Flask. You can download any of them and use the web development framework. Let me try to explain a little bit about both. Flask is a small Python web framework. It is so called because it does not require any special tools or libraries. It is a very simple framework and you can easily read it compared to Django.

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- **Bootstrap:** Bootstrap can be a web-based framework that simplifies the event for educational sites. The main purpose of adding to an online project is to use Bootstrap color selection, background effect, movement size, font, and layout for its project. So, the key is whether the responding engineers get those options the way they want. Once added to a project, Bootstrap provides basic style definitions for all HTML features. The result is the same look of prose, tables, and form elements across all web browsers. Additionally, developers can monetize CSS classes defined in Bootstrap to customize the look and features of their content tools. Bootstrap is used for brightly colored and black tables, brightly colored drag quotes, page titles, and highlighted text.
- **Database:** Database & Information Systems can be a website used in a particular way of life, A website can be a collection of processed information associated with a selected topic or purpose. Let us consider a business, such as delivery agents, that displays a lot of information stored on your computer for a long time. This data may include information about passengers, locations, flights, airplanes, and personnel, for example. Typical relationships that may be represented include booking, location (which passengers are going to which destination?), And order (which order to which destination?). These types of data that are stored more or less permanently on a computer are called a website.

IV. EXISTING SYSTEM

In the presently existing system getting proper health, consultation is not easy.

1. Today everyone wants to live a healthy life and so they are moving toward organic products instead of chemical ones.
2. The same has happened with the pharmaceutical sector. Now people are more driven towards herbal medications.
3. They need proper herbal medication to keep themselves fit and fine.
4. But in today's market where everything is online and just one touch, still finding the proper herb and buying it is not easy.
5. People don't know have information about herbs. There are some online shopping portals which can provide the herbs, but you still need a doctor's consultation about its consumption.
6. Consulting any doctor is a very tiresome task for the patient.
7. There is a lack of a proper health monitoring system that keeps track of a person's daily health.

V. LITERATURE SURVEY

5.1 Machine Learning in Disease Prediction

Following the methods used there, this paper [1] introduces the use of machine learning algorithms to diagnose diseases. The data is imported in CSV format and refined for use. After data you can select the attribute, machine algorithm to include Logistic Regression, Decision Trees, Random Forest, Support Vector Machine (SVM), and Adaptive Boosting, used for predicting the above data.

5.2 Web-Based Disease Prediction & Recommender System

The web-based patient diagnostic program [2] is a central platform for archiving medical history and predicting a potential disease based on current patient characteristics to ensure a faster and more accurate diagnosis. The proposed web-based forecasting system uses a classification-based classification technology based on the National Center for Disease Control (NCDC). The K-nearest neighbor (KNN), the random forest, and the Naive Bayes dividing methods are used and an integrated voting algorithm is also proposed when each category is assigned variable weights based on predictable confidence. The proposed system is also included with a recommendation system to recommend a type of evaluation based on existing patient characteristics to take the necessary precautionary measures.

5.3 Designing Disease Prediction Model using Machine Learning Approach

But accurate symptom-based prognosis becomes difficult for the physician. Because of the growing number of data growth in the medical and healthcare sector the accurate analysis of medical data has benefited early patient care. With the help of disease data, data mining finds hidden pattern information in large amounts of medical data. We have raised the prognosis for common diseases based on patient symptoms. To predict the disease, we use the K-Nearest Neighbor (KNN)

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and Convolutional neural network (CNN) machine learning algorithm to accurately predict the disease. Disease prediction requires a set of symptomatic data.

5.4 Comparing Different Algorithms for Disease Prediction

In particular, we found a small study that made a comprehensive understanding of the published perspective of the topic using different monitored reading algorithms to predict the disease. Therefore, this research paper [4] aims to identify important trends among the different types of machine learning algorithms, their operational accuracy, and the types of diseases studied. Additionally, the advantages and disadvantages of monitoring algorithm are summarized.

5.5 Decision Tree Classifier

Decision Tree Classifier is a supervised learning algorithm that creates a binary tree where the level of each node has a value difference. Decision Tree is built-in top-down from the root node and involves splitting data into subsets that contain the same values. In this research paper [5] the authors used a machine learning method and an advance processing algorithm to predict the disease based on their symptoms. These methods are used to diagnose, analyze, and diagnose based on symptoms.

5.6 Random Forest Classifier

Heart disease is the most dangerous life-threatening disease world-wide. The purpose of this work is to predict the occurrence of heart disease in a patient using a random-forest algorithm. The dataset was accessed from the Kaggle site. The database contains 303 samples and 14 attributes taken from the database. It was then processed using python open-access software in the jupyter notebook. Database is categorized and processed using a machine learning algorithm Random Forest. Database results are defined by accuracy, sensitivity, and certain percentages. Using a random-forest algorithm, we obtained an with a accuracy of 86.9% with a predictive heart rate of 90.6% and a specific value of 82.7%. From the operator's operational characteristics, the rate of diagnosis of a predictable cardiac arrest using random-forest is 93.3%.

5.7 Logistic Regression

Logistic Regression is a mathematical method for classifying database records based on input field values. Predicts dependent variables based on one or more sets of independent variables to predict results. It can be used for both binary division and multiple classification. In this Research paper [7] the author has used this machine to learn the algorithm for predicting heart disease. In the proposed system, the UCI dataset is carried out using appropriate data acquisition, pre-processed data purification, and selecting all the features that have a high connection targeted activity. Then logistics regression model is trained and tested to predict whether heart disease is present or not.

5.8 K-Nearest Neighbour Algorithm

The KNN algorithm assumes that similar objects exist nearby. In other words, the same things are closer to each other. KNN captures the concept of similarity (sometimes called distance, proximity, or proximity) to the numbers we may have learned in our childhood — calculating the distance between graph points. This study [8] proposes to predict heart disease using KNN and rapid measurement parameters. KNN is one of the few data mining algorithms that often use predictive methods.

5.9 Naive Bayes Algorithm

Classification algorithm that uses Bayesian techniques and is based on Bayes theorem in predictive modeling. Naïve Bayes algorithm is primarily used to create class filters. Class labels are predicted using specific category filters. In this paper [9], we use smarter data mining techniques to predict highly predictable diseases that may be linked to patient symptoms, and we use an algorithm (Naive Bayes) to map the potential disease symptoms. This approach not only simplifies the work of the doctor but also benefits the patients by getting the care they need as soon as possible.

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5.10 Study and Development of E-Commerce Website

E-Commerce is the process of doing business online through computer networks. The first goal of the e-commerce site is to sell goods on vision line. The E-commerce website is made up of scripting languages such as HTML, CSS3, JavaScript, and Bootstrap. This vernacular makes the website even more attractive and useful and easy to use and purchase. This research paper [10] provides insight into the development of e-commerce websites. Although we understand the essence of its various features and the special emphasis of B2Ce-commerce. It has shown tremendous growth in recent years due to increased consumer awareness, investor confidence, and increased technology. This research also produced specific styles and features that will promote further growth within the e-commerce market in India.

5.11 Development of E-Commerce Website using Django

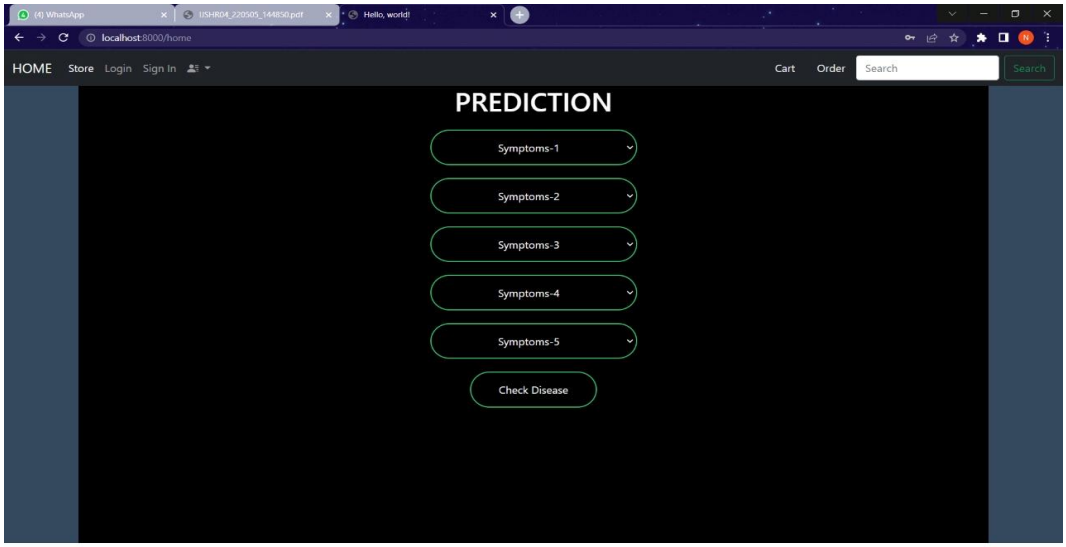
Online Shopping is a lifestyle e-commerce web application, which sells a variety of products. The main purpose of this study is to improve the commercial website and integrate the payment processor. It also provides easy access for administrators and administrators to check user-placed orders. This paper discusses how Django is used to improve e-commerce website and third-party software and related information base; SQLite which was used for storing data. For example a computer or a cloud service.

5.12 Django Framework

This is a research paper for python based web framework known as Django. Model View Template structure with some modification is defined within the reasearh paper and helps us to understand why we use Django over other web-based frameworks and how we can incorporate it into our system and create a basic project using this feature following our paper and lessons about these differences. Which is available to us and helps us to understand the MVT structure of this framework very briefly. This paper covers everything needed for an individual or student to start with the Django framework and learn the basics to create some simple projects related to the Django web framework and make learning integrated and easy even for a person with a disability. Django template is a Python series used with Django template language. And there are other formats known and translated with template engine. Variables and tags. Template provided in context. The offer is flexible in terms of its values, viewed at the top of the content, and then tagged

VI. RESULT

The Project's prediction module is analysis-based. Thus, the result obtained after the symptoms reprocessing is directly shown on the screen, and Herbs are recommended right away. A sample output has been shown below for the symptoms of the disease Bronchial Asthma.



Above is shown a simple layout with a drop-down menu is given with options to add Symptoms.

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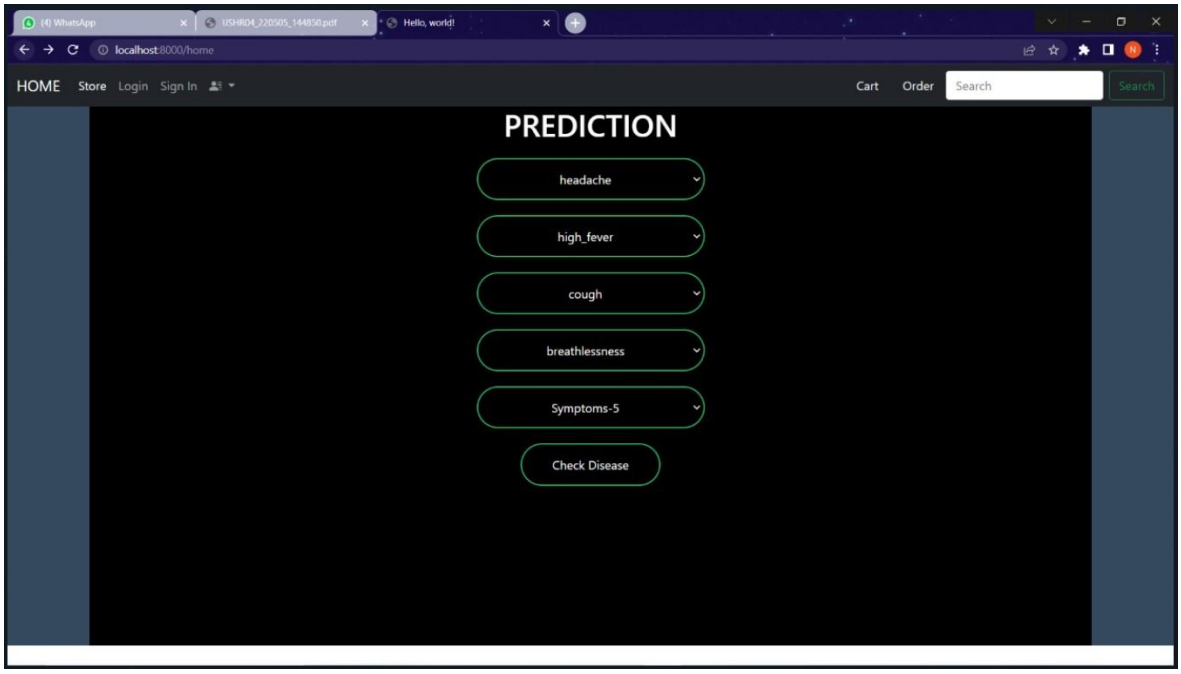

The prediction system works on a Naive Bayes algorithm so as soon as the symptoms are added the prediction algorithm shows the output as "Bronchial Asthma", and recommends Herbs related to it.

VII. Conclusion

In this paper, we introduced an Online health shopping portal. Smart Health Consulting and Online Health Shopping Portal with Product Recommendation System tend to overcome a lot of medical-related problems. Critical problems which are ignored. This system mainly focuses on the simplifying process of disease prediction which generally takes a lot more time and needs the knowledge of a talented doctor. We have provided a system where we can predict the disease of a person from the symptoms that he's facing. This will be helpful to those who seek help online. The rush time at hospitals can be avoided by this.

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