International Journal on Recent and Innovation Trends in Computing and Communication
ISSN: 2321-8169 Volume: 11 Issue: 1
Article Received: *05 December 2022* ***Revised:*** *02 January 2023* ***Accepted:*** *30 January 2023*

Improvement in Diagnosis in Healthcare System Using Machine Learning Algorithm

Dr. Rajesh B. Mapari
Associate Professor, Anuradha Engineering college Chikhli 443201
aecedc@gmail.com

Abstract: It is currently hard to identify patient data at a vital time due to the fact that the data differ from hospital to hospital, despite the significant developments in technology that have occurred in recent years. Therefore, a computer program or system that is automated will be of assistance in the process of securely sharing the patient's data with the concept of a central database. Maintaining the record in a digital format will be beneficial, as it will assist both the physician and the hospital in maintaining it in an appropriate manner. The Healthcare Management System is an application that is based on the web and may determine the ailment that the user is suffering from based on the symptoms that the user has provided. By utilizing the data that is generated throughout the numerous diagnostic procedures that are performed in different hospitals, the Healthcare Management System is able to obtain an accurate diagnosis, while also assisting in the referral of the patient to the physician for additional advice. The primary purpose of the research topic is to make the health system more systematic in terms of the availability of doctors and the level of satisfaction experienced by patients together with the relevant resources. The centralized database of patient ids was not available in any scenario, which would have assisted the patient in locating themselves from any diagnosis procedure and treatments. Additionally, this system includes the study of case history for doctors, which will make it easier for them to recommend appropriate treatment. In this system, we make an effort to make the system accessible to every individual who is connected to the system.

Keywords: *Data, Application, Healthcare, Resources, Recommend*

1. INTRODUCTION

In today's world, the development of a healthcare management system has become an indispensable component of the management of any medical office or hospital. As a result of its ability to facilitate the flow of any application, its demand was likewise continuously growing. It is a significant component of the medical system due to the fact that it is widely known among persons and has a wide range of applications. It causes the system to be fully dependent on the centralized server for retrieving patient data, data from doctors, and a great deal of other information, which makes it vulnerable from a security point of view. In the system that was proposed, we concentrated on the maintenance of the system from a security point of view. It makes the task automatic rather than requiring manual labor, and it will be simple to keep the records in the order of priority by constructing and developing some filters according to the requirements. Data can be maintained in a database with the assistance of these technologies, and it can be retrieved whenever it is needed.

1.1 Phase including in the process:

1.1.1 One of the five steps of the HMS is the generation of a unique patient identification number. A patient's unique identifier is generated during this phase whenever the patient is scheduled to visit any hospital. This identifier contains the patient's complete diagnosis reports as well as the treatment parameters. Additionally, it contains all of the information on the patient's laboratory reports, X-rays, MRIs, and a variety of other details. The patient's name, cell phone number, and the ID itself can all be used to search for the identified individual. The only important requirement is that the medical facility must establish a connection to a centralized database.

1.1.2 The Disease Phase, Exercise and dietary recommendations, as well as a diagnosis After the patient ID has been generated, all lab reports have been manually entered, and the symptoms of patients have been recorded, everything has been saved in the system, and there is only reliance on that database. The disease has been anticipated, and it is recommended that patients maintain a healthy diet and exercise regularly.

1.1.3 Once the disease was anticipated by the system, it

International Journal on Recent and Innovation Trends in Computing and Communication
ISSN: 2321-8169 Volume: 11 Issue: 1
Article Received: *05 December 2022* ***Revised:*** *02 January 2023* ***Accepted:*** *30 January 2023*

became simple in the final phase to recommend the doctor by referring to the patient history of each individual doctor. This allowed the doctor to be predicted for accurate diagnoses, which unquestionably saved the patient both time and money.

1.1.4 An efficient diagnostic system is the fourth phase. Through the appropriate exploitation of database resources created by a variety of patient and doctor management systems, it assists in the identification of the condition. In the event that a patient requires therapy, it is beneficial to diagnose the patient with effective medication and treatments, taking into account the patient's medical history.

1.1.5 In the fifth phase, the doctor is referred to. This model makes it simple for physicians to obtain information on new research and work that is anticipated to be carried out in a variety of countries. This makes it possible for physicians to better manage their resources at any given time and consult with patients for the purpose of improving their health. In the current pandemic crisis, if the doctors are able to comprehend the diagnosis information, then it is possible that it will be easily comprehended by other doctors and researchers, which will also contribute to the reduction of the spread.

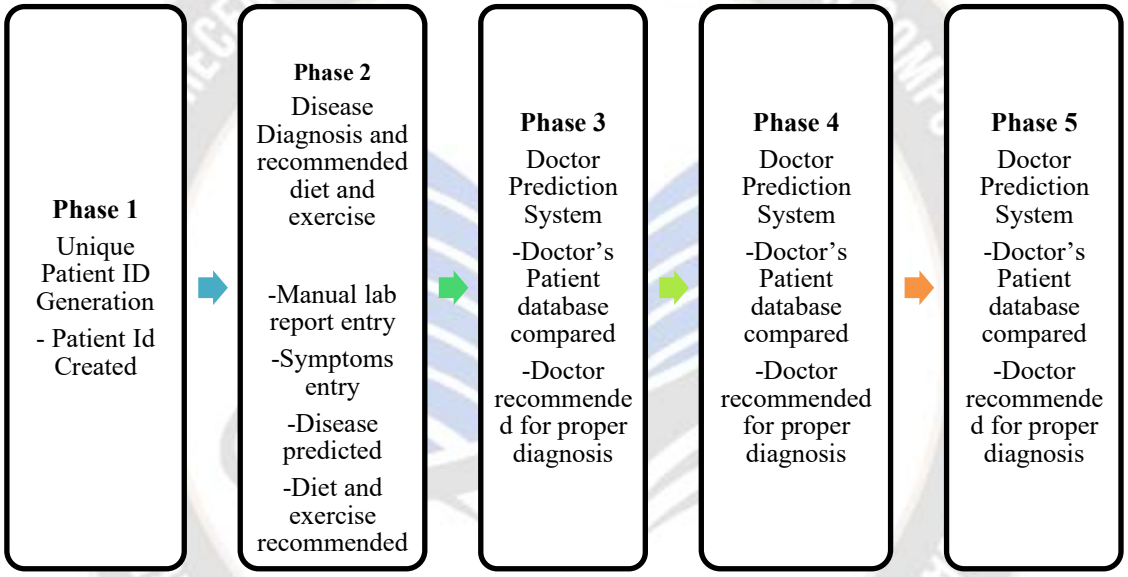

Fig 1.1: Flow of the process

2. LITERATURE SURVEY

iHealth365 is one of self-health management systems, which is a platform for medical institutions or companies to manage health of customers or employees. iHealth365 can allow users to upload their report of regular comprehensive physical examination and analyze the vital signs of the report, and it also provides not only the assessment of health risk but also the health data visualization and reminds system to supervise the users. Furthermore, the smart phone app of the iHealth365 for the users can get an improvement plan to maintain their health. The experts also can use this system to help their patients in real time when the patients give the feedbacks. The iHealth365 also provides a function for collecting data from the wearable devices. But iHealth365 system does not automatically provide personal diet and exercise guidelines, and it still needs medical experts to analyze the report to suggest the personal guidelines.

In addition, Lin et al. proposed VASP (Virtual Assistant System for Personal health management), a virtual assistant system for personal health management, which can analyze the report of regular comprehensive physical examination result to evaluate the health risk and provide personalized healthcare services for users in terms of diet and exercise guideline recommendations. Furthermore, the system also can supervise and remind users to meet the recommended plans of personalized diet and exercise guidelines. Although the designed system provides automatic recommendations of personalized diet and exercise guidelines according to the analysis of the individual report of regular comprehensive physical examination, it lacks of the instantaneity and the interaction for users.

K.M. Al-Aidaroos, A.A. Bakar and Z. Othman have conducted the research for the best medical diagnosis mining technique. For this authors compared Naïve Bayes with five other classifiers i.e. Logistic Regression (LR), KStar (K*), Decision Tree (DT), Neural Network (NN) and a simple rule-based algorithm (ZeroR). For this, 15 real-world medical problems from the UCI machine learning repository (Asuncion and Newman, 2007) were selected for evaluating the performance of all algorithms. In the experiment it was found that NB outperforms the other algorithms in 8 out of 15 data sets so it was concluded that the predictive accuracy results in Naïve Baeyes is better than other techniques.

Darcy A. Davis, Nitesh V. Chawla, Nicholas Blumm, Nicholas Christakis, Albert-Laszlo Barabasi have found that global treatment of chronic disease is neither time or cost efficient. So the authors conducted this research to predict future disease risk. For this CARE was used (which relies only on a patient's medical history using ICD- 9-CM codes in order to predict future diseases risks). CARE combines collaborative filtering methods with clustering to predict each patient's greatest disease risks based on their own medical history and that of similar patients. Authors have also described an Iterative version, ICARE, which incorporates ensemble concepts for improved performance. These novel systems require no specialized information and provide predictions for medical conditions of all kinds in a single run. The impressive future disease coverage of ICARE represents more accurate early warnings for thousands of diseases, some even years in advance. Applied to full potential, the CARE framework can be used explore a broader disease histories, suggest previously unconsidered concerns, and facilitating discussion about early testing and prevention. (A.Davis, V.Chawla, Blumm, Christakis, &Barbasi, 2008)

JyotiSoni, Ujma Ansari, Dipesh Sharma and SunitaSoni have done the research paper into provide a survey of current techniques of knowledge discovery in databases using data mining techniques that are in use in today's medical research particularly in Heart Disease Prediction. Number of experiment has been conducted to compare the performance of predictive data mining technique on the same dataset and the outcome reveals that Decision Tree outperforms and sometime Bayesian classification is having similar accuracy as of decision tree but other predictive methods like KNN, Neural Networks, Classification based on clustering is not performing well. The second conclusion is that the accuracy of the Decision Tree and Bayesian Classification further improves after applying genetic algorithm to reduce the actual data size to get the optimal subset of attribute sufficient for heart disease prediction. (JyotiSoni, Ansari, Sharma, &Soni, 2011)

3. PROBLEM FORMULATION

Diet and exercise are the most important aspects to deal with in order to keep the health problems under control and to adhere to the recommendations of the physician. Due to the fact that you have a hectic lifestyle and a busy schedule, it becomes difficult to keep it in the appropriate manner. There were a lot of people who made a resolution to adhere to the diet and exercise program in a strict manner, but they did not succeed. Therefore, in order to further emphasize its significance, we created a method that would make the health procedure from the beginning to the finish. In the beginning, we begin by registering the patient, and then we proceed to maintain the database in accordance with the standards. After that, once the patient has been registered, their complete medical records will be kept in a centralized health care system. This will include lab data, diagnostic procedures, and recommendations from the doctor. By virtue of all of this, a sophisticated diet and exercise routine will be prescribed for the patient's proper health recovery. There were a lot of diet and exercise plans that were supplied to a lot of patients, but the diet and exercise plans that will be provided will be based on the symptoms and diagnostic procedure that will aid the doctor and the patient prove that the patient is making a rapid recovery from their health condition.

4. PROPOSED METHODOLOGY

Following Module will work in accordance with the HMS.

4.1 Patient Registration:

Patient registration through doctor hospital reception or admin panel

International Journal on Recent and Innovation Trends in Computing and Communication
ISSN: 2321-8169 Volume: 11 Issue: 1
Article Received: *05 December 2022* ***Revised:*** *02 January 2023* ***Accepted:*** *30 January 2023*

Fig4.1: Patient Registration

4.2 Symptoms Valuation

Recommendation of diet, exercise and disease diagnose procedure was calculated as per the dataset.

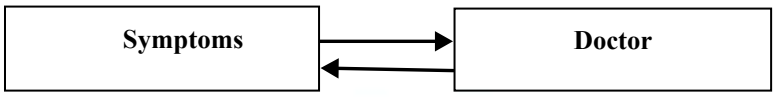

Fig4.2: Symptoms Valuation

4.3 Lab Test

Lab test records was feeded into the system as any reports or in images format

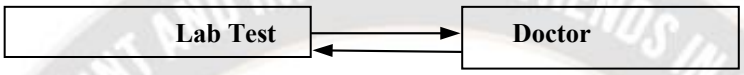

Fig4.3: Lab Test

4.4 Suggested Diet and Exercise Chart

Diet and exercise prediction was done as per the the patient diagnostic procedure

Fig4.4: Suggested Diet and Exercise Chart

4.5 Valuation of Patient

Prescription was generated as per the patient symptoms and diet and exercise was properly suggested and main importantly this overall procedure was saved in centralized management system.

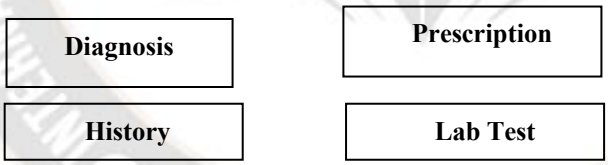

Fig4.5: Valuation of Patient

5. CONCLUSION

The day-to-day existence of an individual is of utmost significance, and in order to ensure that it is maintained in an appropriate manner, it is necessary to meticulously schedule health care conditions. In addition to assisting in the maintenance of the patient's diet and exercise routine in accordance with the diagnostic records, the proposed system also aids in the centralization of the record-keeping process. Through the utilization of the Django framework, the Health Management System was effectively created. This is a powerful system that enables users to grant permissions on modules, pages, and even controls that are contained within pages within the system. The system is simple to operate, friendly to users, and widely accessible to those who will ultimately be using it. As a result, we are able to assert that this method has the potential to assist individuals in maintaining a healthy lifestyle and bringing the disease under control. Because of this, our healthcare system offers dietary and exercise recommendations, as well as precautions and tests that are indicated based on the symptoms that are presented, which ultimately contributes to improved patient care. In addition to providing senior management with a single point of control, it encourages improved collaboration between the many government ministries. By minimizing the

amount of paperwork that needs to be completed, the system prevents any data from being overlooked and provides an easy-to-use facility for updating.

REFERENCES

[1] An Interactive Healthcare System with Personalized Diet and Exercise Guideline Recommendation TAAI2015 Tainan, Taiwan Nov. 20-22, 2015.

[2] Health Promotion Administration, Ministry of Health and Welfare. Available online: http://health99.hpa.gov.tw/TXT/HealthyHeadLineZone/HealthyHeadlineDetai.aspx?TopIcNo=5170 (accessed on 8 August, 2014) 531 TAAI2015 Tainan, Taiwan Nov. 20-22, 2015.

[3] Wu, Chun-Hui, Fang, Kwot-Ting, and Chen, Ta-Cheng: Applying data mining for prostate cancer. In: the International Conference on New Trends in Information and Service Sci- ence,pp. 1063-1065, Beijing(2009).

[4] Tsai, Chung-Huang, and Lin, Gau-De: Prevalence of the Metabolic Syndrome in Individ- ualsSeeking for Health Examination. Ching Medical Journal, 10-16(2006).

[5] Lin, Feng-Yu, Hwu, Yueh-Juen, and Chen, Yun-O: Data Mining Technology Applied to Adult Check-Up Data. Journal of Nursing and Healthcare Research, 6(2):117-124(2010).

[6] Lin, Yi-Siang: Apply the Health Examination Data to Construct.

[7] A.Davis, D., V.Chawla, N., Blumm, N., Christakis, N., &Barbasi, A. L. (2008). Predicting Individual Disease Risk Based On Medical History.

[8] Adam, S., &Parveen, A. (2012). Prediction System For Heart Disease Using NaiveBayes

[9] Al-Aidaroos, K., Bakar, A., & Othman, Z. (2012). Medical Data Classification with Naive Bayes Approach. Information Technology Journal

[10] Darcy A. Davis, N. V.-L. (2008). Predicting Individual Disease Risk Based On Medical History

[11] JyotiSoni, Ansari, U., Sharma, D., &Soni, S. (2011). Predictive Data Mining for Medical Diagnosis: An Overview Of Heart Disease Prediction

[12] NisharBanu, MA; Gomathy, B;. (2013). Disease Predicting System Using Data Mining Techniques

[13] K.M. Al-Aidaroos, A. B. (n.d.). 2012. Medical Data Classification With Naive Bayes Approach.

[14] Daniela XHEMALI, Christopher J. HINDE and Roger G. STONE Naïve Bayes vs. Decision Trees vs. Neural Networks in the Classification of Training Web Pages:IJCSI International Journal of Computer Science Issues, Vol. 4, No. 1,2009.

[15] JyotiSoni, Ujma Ansari, Dipesh Sharma, SunitaSoni. Predictive Data Mining for Medical Diagnosis: An Overview of Heart Disease Prediction: International Journal of Computer Applications (0975 – 8887) Volume 17– No.8, March2011.

[16] SajeethaThavareesan: Android Based Patient's Healthcare Management System; Journal of Information Systems & Information Technology (JISIT) Vol. 1 No. 12016.

[17] HamsaShwetha V , KruthikaPrarthana M K , Shivani C , Siva Naga Suresh Purama , S P Muthukumar : "HEALTHWISE" – AN ANDROID APPLICATION FOR PERSONAL HEALTH AND NUTRITION MANAGEMENT; Proceedings of the International Conference on Current Trends in Engineering and Management (ICCTEM 2012) 12-14 July2012.

[18] Bruno Vieira Resende E Silva, MiladGhiasi Rad, Juan Cui, Megan McCabe and Kaiyue Pan; A Mobile-Based Diet Monitoring System for Obesity Management; J Health Med Informat 2018, Vol 9(2).

[19] Lan, Guo-Cheng, Lee, Chao-Hui, Wu, Jin-Shang, Li, Huan-Chung, Ho, Shing-Hua, and Tseng, Vincent S.: A Framework for Personalized Health Trend Analysis. In: the 10th In- ternational Symposium on Pervasive Systems, Algorithms, and Networks, pp. 405-410 (2009)).

[20] Lin, Y.-F., Shie, H.-H., Yang, Y.-C., and Tseng, Vincent S.: Design of a Real-Time and Continua-based Framework for Care Guideline Recommendation. International Journal of Environmental Research and Public Health (IJERPH), 11(4), 4262-4279(2014).

[21] Lin, Y.-F., Chu, C.-H., Lin, B.-H, Yang, Y.-C., and Tseng, Vincent S.: A Framework for Personalized Diet and Exercise Guideline Recommendation. The Conference on Technologies and Applications of Artificial Intelligence (TAAI), pp. 274-283(2014).