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MEDICAL & HEALTHCARE INDUSTRY RESOURCE ALLOCATION USING DATA MINING

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Abstract - In the health sector, a large number of people need and approach the health center for their attention.Most patients do not receive enough care in the health sector, for example data such as medicines,operation theatre, instruments ready to use, rooms, wards and medical products to all humans in hospitals In certain conditions, some patients have a critical stage or emergency where the resource will not be accessible, in such circumstances people may need to move the hospital or any home where they can get the resources they need most. Previous model utilized in healthcare sector is Support Vector Machines; supports a direct learning model for classification, regression and edge detection.When the difficulty of the data and their classification increases, our previous model fails to satisfy the preferred condition. So we propose a neural network model, which is a series of algorithms that endeavors to accept the underlying relationships in a dataset through a process that copies the operation of human brain likewise, our suggestion algorithm helps to attribute data in our health process. By achieving systematic resource allocation, our patients get what they need when they need it most

Key Words: Neural network model and Support vector machines

1.INTRODUCTION

Broadly speaking, resource allocation is allocating and managing benefits in a way that helps an organization's strategic goals. Many organizations struggle to utilize the resource allocation optimally for profitability and sustainability. In our case we use resource allocation in Healthcare sector to give better treatment to a patient who need right treatment at right time. Initially Support Vector Machines are the most standard data mining algorithm that is being used by the healthcare industry. This Support vector machine does not perform very well when the data set has more noise i.e. target classes is overlapping.Then, we proposed a model based on a neural network, which helps to organize several resources in several health centers.When a patient requires treatment beyond the emergency or for a general examination, patients cannot be struck by any fate. As our application creates an environment for proper supply chain of resource and resource classification and allocation is handled by effective Neural Network we mitigate this problem.

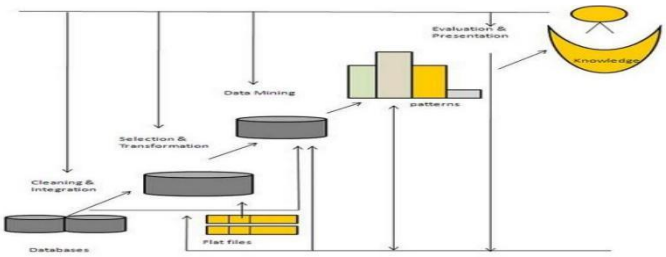


Figure 1: Overview of Data Mining

2. RELATED WORKS

[1] Zhou, Y.F., Wang, Z.M.: Dynamic instability of axially moving viscoelastic plate. Eur. J. Mech. A Solids 73, 1–10 (2019)

This paper is devoted to the investigation of the transverse vibration and dynamic stability of the axially moving viscoelastic plate with two opposite edges simply supported and other two opposite edges with simply supported or free. By considering the Kelvin–Voigt model of viscoelasticity, the equation of motion of the plate is derived. The normalized power series method is employed to obtain the complex eigen equations for the axially moving viscoelastic plate. The variation relationship between the first three complex frequencies of the system and the dimensionless axially moving speed with different aspect ratio and dimensionless delay time are analyzed. The results show that the dimensionless delay time, axially moving speed as well as the aspect ratio have remarkable effects on dynamic behaviors and stability of the axially moving viscoelastic plate.

[2] K.-S. Hong and P.-T. Pham, "Control of axially moving systems: A review," Int. J. Control Autom. Syst., vol. 17, no. 12, pp. 2983–3008, 2019.

A comprehensive review of significant works on active vibration control of axially moving systems. Owing to their broad applications, vibration suppression techniques for these systems have generated active research over decades. Mathematical equations for five different models (i.e., string, beam, coupled, plate, and approximated model) are outlined. Active vibration control of axially moving systems can be performed based on a finite-dimensional model described by ordinary differential equations (ODEs) or an infinite-dimensional model described by partial differential equations (PDEs). For ODE models, the sliding mode control is most representative. For PDE models, however, there exist various methods, including wave cancellation, Lyapunov method, adaptive control, and hybrid control. Control applications (lifting systems, steel industry, flexible electronics, and roll-to-roll systems) are also illustrated. Finally, several issues for future research in vibration control of axially moving systems are discussed.

[3] Z. Zhao and Z. Li, "Finite-time convergence disturbance rejection control for a flexible Timoshenko manipulator," IEEE/CAA J. Automatica Sinica, early access, 2020

A new finite-time convergence disturbance rejection control scheme design for a flexible Timoshenko manipulator subject to extraneous disturbances. To suppress the shear deformation and elastic oscillation, position the manipulator in a desired angle, and ensure the finitetime convergence of disturbances, we develop three disturbance observers (DOs) and boundary controllers. Under the derived DOs-based control schemes, the controlled system is guaranteed to be uniformly bounded stable and disturbance estimation errors converge to zero in a finite time. In the end, numerical simulations are established by finite difference methods to demonstrate the effectiveness of the devised scheme by selecting appropriate parameters.

PROPOSED SYSTEM:

We proposed neural networks are mathematical models, originally inspired by biological processes in the human brain. They are constructed from several simple processing elements interconnected by weighted pathways to form networks. Each element computes its output as a non-linear function of its weighted inputs. When combined into networks, these processing elements can implement arbitrarily complex non-linear functions which can be used to solve classification, prediction, or optimization problems. When the hospital management doesn't have enough resources which leads to endangerment of patient's life, Proper treatment not given to required patients even though the resources are available but at different healthcare center. Neural Network model which can be flexible to allocate resources for the patient in the nearest hospital. These services should be provided in an efficient, cost-effective manner to reduce the time and resources currently required for such a process.

Advantages

- Neural Networks have the ability to learn by themselves and produce the output that is not limited to the input provided to them.
- The input is stored in its own networks instead of a database; hence the loss of data does not affect its working.
- These networks can learn from examples and apply them when a similar event arises, making them able to work through real-time events.
- Even if a neuron is not responding or a piece of information is missing, the network can detect the fault and still produce the output.
- They can perform multiple tasks in parallel without affecting the system performance.

4.3.1 MODULES DESCRIPTIONS:

1) **RECEPTION MODULE**
2) **DOCTOR MODULE**
3) **RESOURCE MANAGEMENT**

4) **ADMIN MODULE**
5) **HOSPITALS**

4.1.1.RECEPTION MODULE:

In the Reception Module reception member is going to login into the field, then the field receptionist registers the patient with the necessary required details like name, address, mobile number and medications, if any are taken then the registration, is finished then the patient is sent to treatment, and the patient list is saved to the database for the further process for the application.

3.1.2. DOCTOR MODULE:

In the Doctor module first, log in to the module then view the list of patients is registered for the treatment and the doctor started the treatment planning and finds the prognosis the description for that. Then the treatment or medication is prescribed to the patients. And resource for the patient is allocated by resource management if required treatment is available. Then the further process is executed.

3.1.3.RESOURCE MANAGEMENT:

In this Module, resource management is logged in to the field then view the list of patients is waiting for the resource allocation. If the prognosis of the patient's treatment is available then the patient is allocated for the resource. If the resource is not available for the patients then need to transfer for the resource. The Not available list is sent to the admin for further process.

3.1.4. ADMIN MODULE:

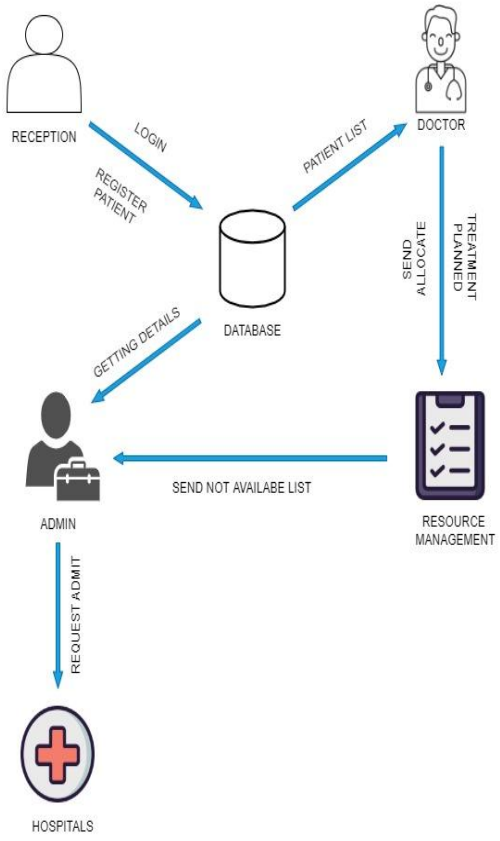
Admin logged into the field after that the admin is checking all other modules and checked the list of patients who needed the resource allocation. Then the admin going to check the resource with the registered hospital's list and if a resource is available in the list of hospitals who have registered then, the admin request the hospitals to admit the patient for their treatment. If the request is accepted then the patient's is transferred to that hospital.

3.1.5. HOSPITALS:

In the Hospitals module, first, need to register and log in to the Module and the hospital's employee or manager or director going to register their hospitals in the application. The registration of the hospital's forms with the details, about the hospitals and address than, their specialization of prognosis. If registration is successful then the requested list of the admission of the patients is accepted by the hospitals.

4. ARCHITECTURAL AND DATAFLOW DIGRAM

4.1 SYSTEM ARCHITECTURE:



4.2. DATAFLOW:

1) A Data Flow has only one direction of flow between symbols. It may flow in both directions between a process and a data store to show a read before an update. The latter is

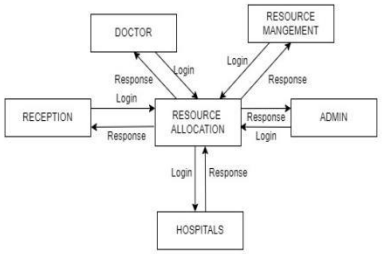
usually indicated, however by two separate arrows since these happen at different type.

2) A join in DFD means that exactly the same data comes from any of two or more different processes data store or sink to a common location.
3) A data flow cannot go directly back to the same process it leads. There must be at least one other process that handles the data flow produce some other data flow returns the original data in the beginning process.
4) A Data flow to a data store means update (delete or change).
5) A data Flow from a data store means retrieve or use.

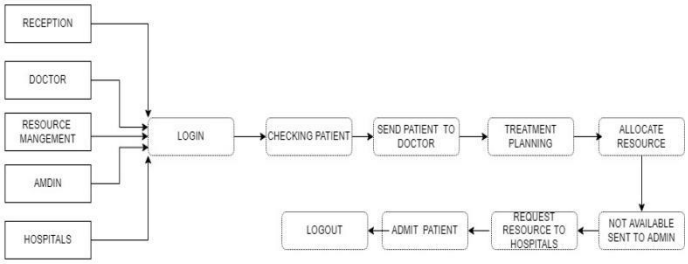
A data flow has a noun phrase label more than one data flow noun phrase can appear on a single arrow as long as all of the flows on the same arrow move together as one package

4.3.DATAFLOW DIAGRAMS:

LEVEL 0



LEVEL 1



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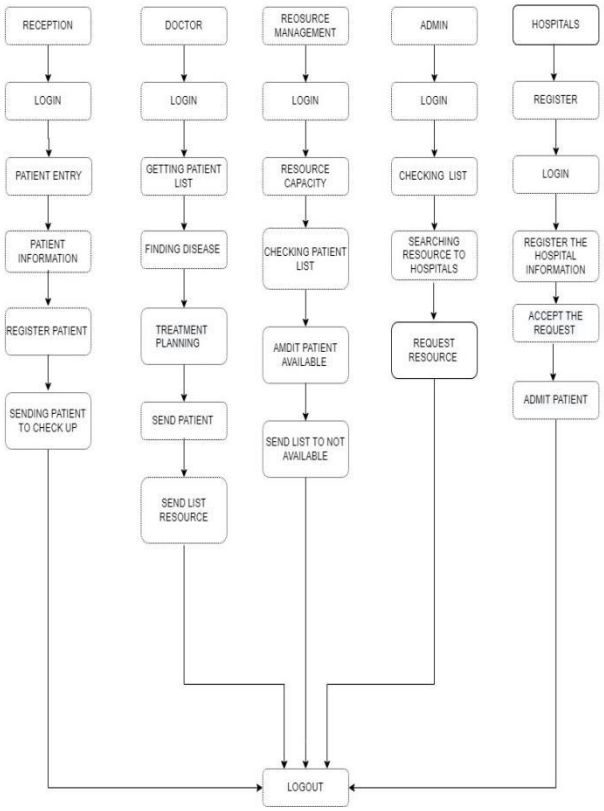
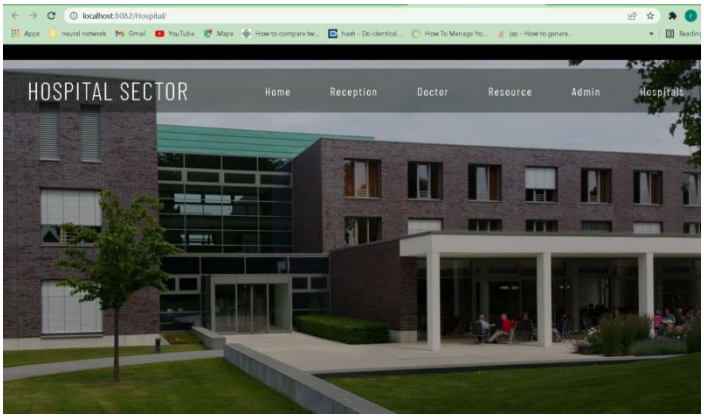
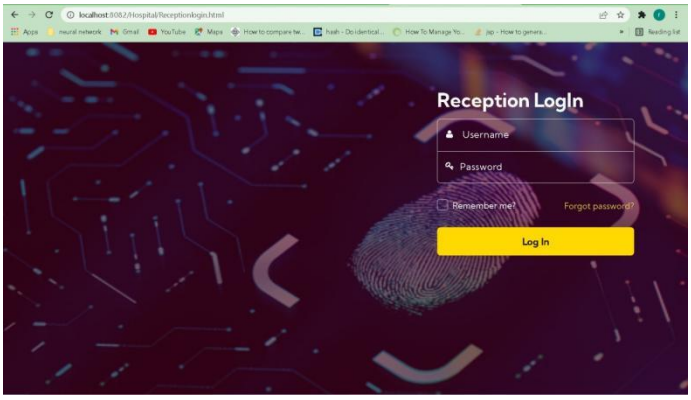


5. OUTPUT SCREENS

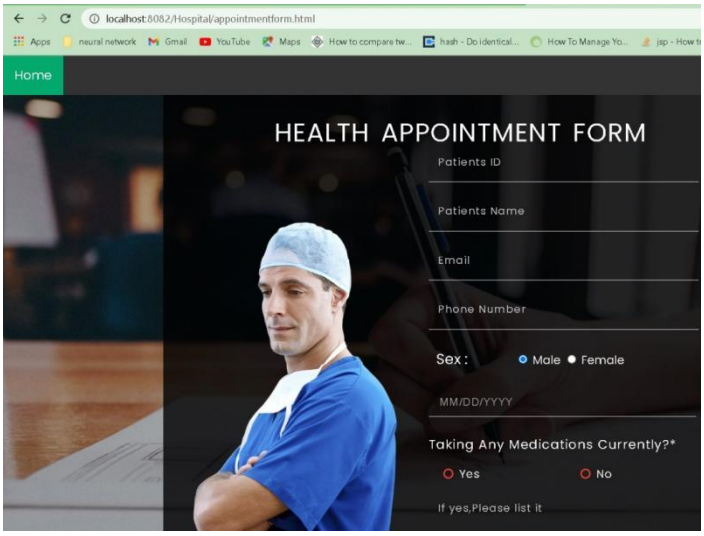
5.1.Homepage



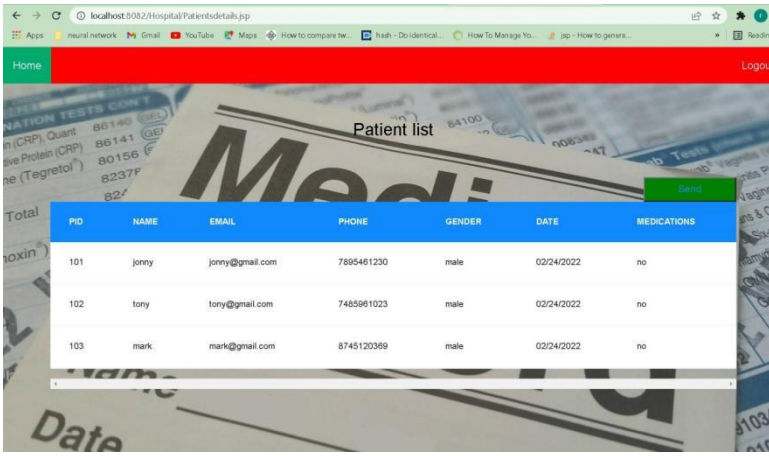
5.2.Login



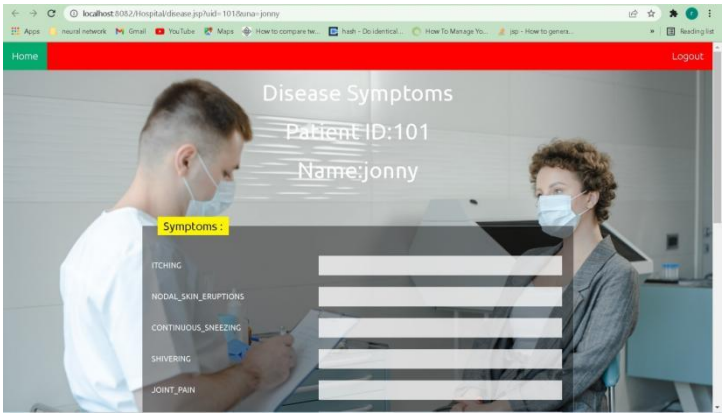
5.3.Appointment



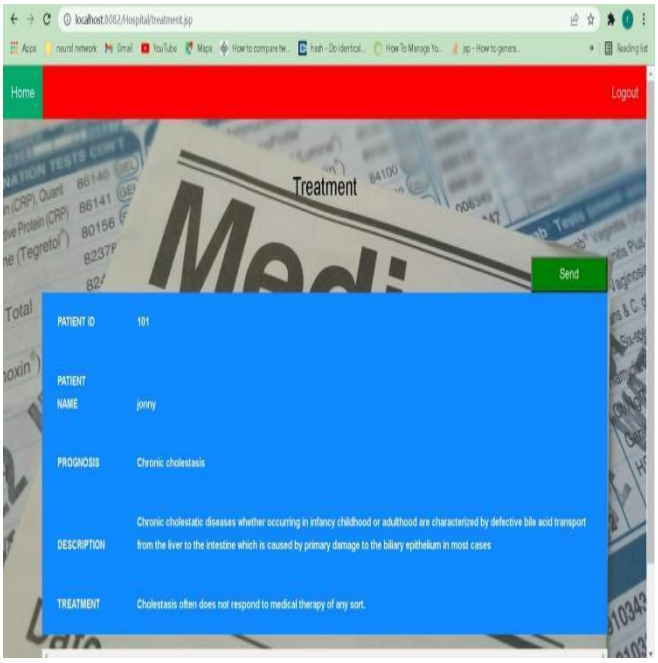
5.4.Patient list



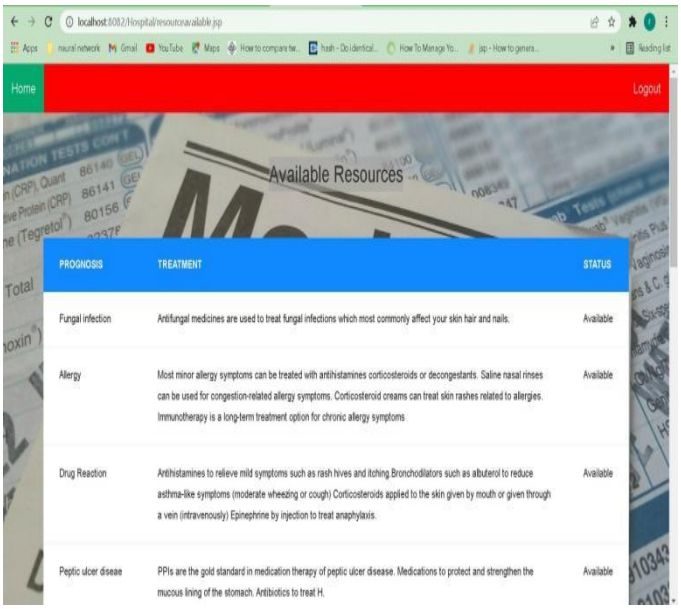
5.5.Disease prediction



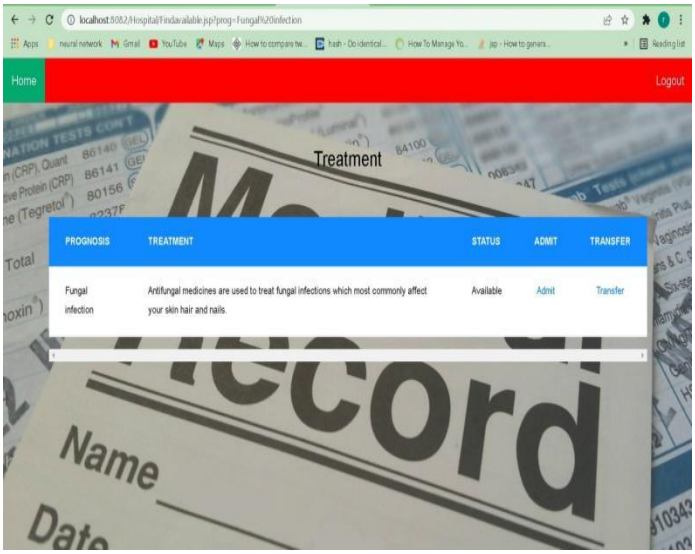
5.6.Treatment



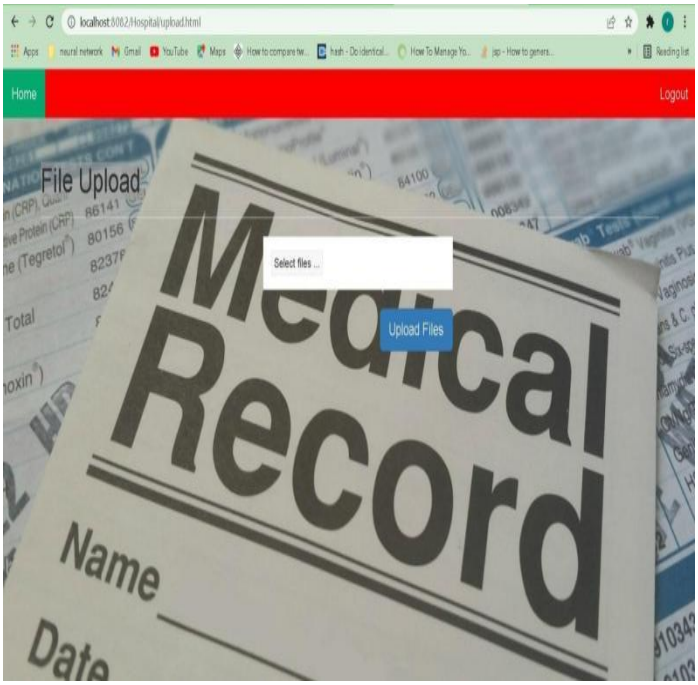
5.7.Resource Available



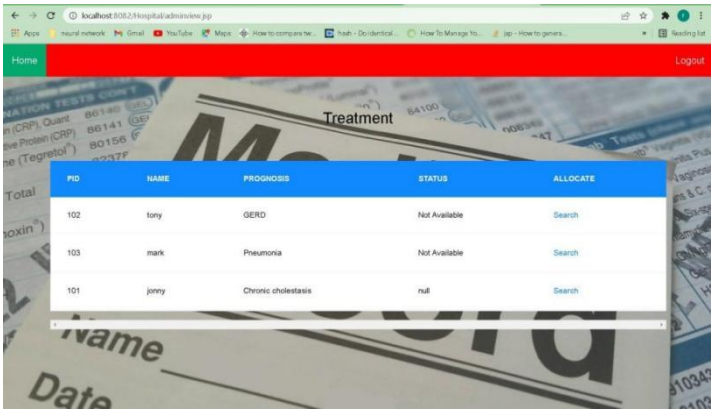
5.8.Admit or Transfer



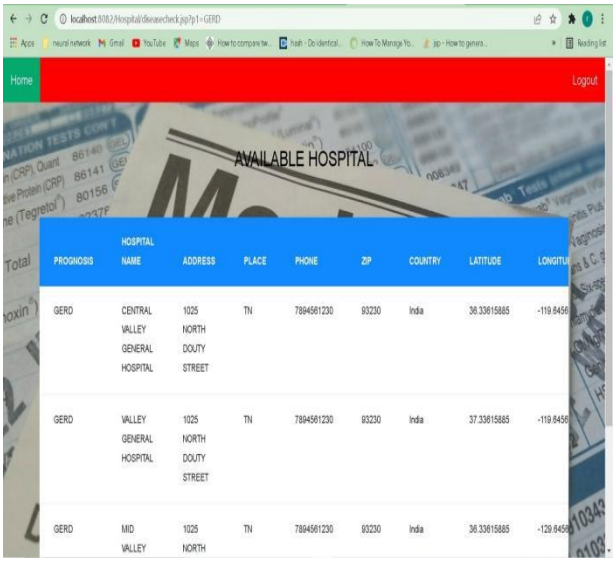
5.9.Upload



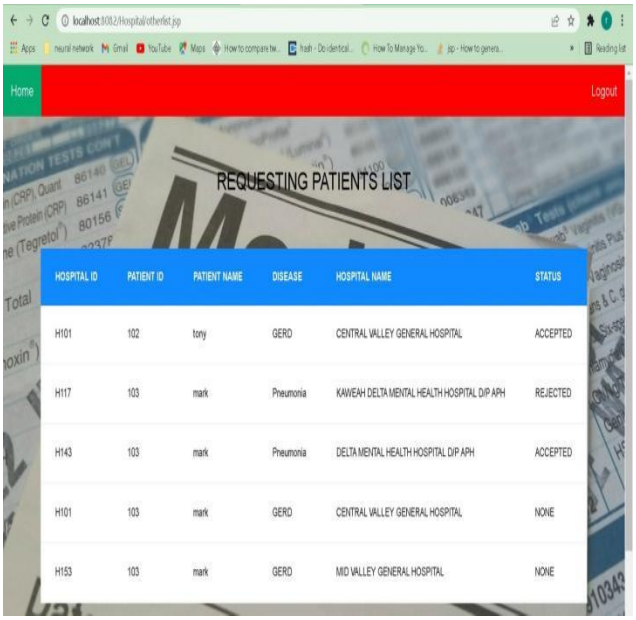
5.10.Search



5.11.Available Hospital



5.12.Request



5.13.Accept or Reject

6.Conclusion:

In our case, the resource allocation plays a vital role in highly sensitive environment like healthcare center. Huge number of patients are not given the most required treatment for the individual when the resources are not available in that particular location and there is no proper intimation were those patient can find the required resources for the treatment, as these centers are not integrated and effective model to resource allocation. So we use resource allocation in a neural network in the hospital sector which gives an efficient and cost-effective manner to reduce the time. In the future, we can use artificial intelligence related concepts for the hospital management and resource allocation system, so we may reduce time more effectively and we enhance hospital management with emerging technology.

7.ACKNOWLEDGEMENT

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