IJIEMR Transactions, online available on 20th July 2020. Link

:http://www.ijiemr.org/downloads.php?vol=Volume-09&issue=ISSUE-07

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Volume 09, Issue 07, Pages: 129 - 138

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CONCIOUSNESS OF GOVERNMENT MEDICAL FACILITIES IN HOSPITALS USING DATA MINING

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Abstract: Now a day's people are facing difficulties to find the suitable medical facilities provided by the government due to their un-awareness either about the schemes or the process of approaching to get the eligible schemes. There are cases where people get tired of contacting the incorrect medical facilities for which they are ineligible and leave it aside. In order to overcome these situations, we develop a mobile based system that has all the required information regarding available government schemes nearest medical facilities where users can search nearby hospitals using Bellman-Ford Algorithm (with respect to current location) that support applicable Government Schemes along with medical facilities using Cluster Analysis in Data mining. It also shows all Government Schemes available in particular state. This system also uses Google Maps API to guide the user from their current location to the nearest selected hospital. So that the user can easily get the nearest way to reach the hospital.

1. Introduction

This prototype is a user-friendly mobile application where users can search nearby hospitals (with respect to their current location) that support applicable government schemes. It also shows all government schemes available in a particular state .Although, there are services like searching nearby medical facilities, available schemes in a particular hospital but they are not even a single application which covers all the necessary information. That gap will be covered by this distinct application that integrates all the required medical facilities in a single platform so that people can find what they need with ease and quick. Our application allows the user to find the best medical facilities available near him by using various filter options based on hospital name, disease name etc. By selecting nearby hospital, the user can view various information like hospital address, timings, contact information, facilities, and specialists with their available timings and also they can check whether Government schemes/Medical insurances are applicable in that hospital or not.

Our application allows the user to find nearby diagnostics centers for scanning, blood tests, x-ray, ECG, Sugar test etc. Our application will also guide the user to

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the corresponding destinations (Hospitals, medical stores, blood bank) through various options like by cab, walk, bus services etc. By using our app, the users can book online appointments with doctors by checking their availability. They can also chat with the doctors online/offline. By selecting nearby pharmacy/medical store, the user can avail options like Pharmacy address, timings and contact information .Uploading the prescription online and purchasing the same. By using our application, the user can use online/offline payment methods and use the coupon code in our app to avail best discounts from different vendors. By using our application, the user can register for blood donation campaign and also he can view the availability of blood in various blood banks. Our app allows user to store their medical records (prescription, lab reports) online, so that they can share the records easily with the doctors or medical stores. By using health wellness option in our app, the user can view various health tips and suggestions provide by the doctors. The user will also be notified with the different health awareness programs organized by the government Our application provides online payment, E-wallet, and coupons to the user. Our app provides the necessary First aid services required by the user in case of emergency. This application also provides a local language translation.

2. Literature Review

The solution for the above problem statement is given based upon the real-time scenarios. They are:

A.Scenario-1:

No time to reach hospital to find medical facilities and government schemes due to busy Life schedule.

Solution: By using our application user can view nearby hospitals(government hospitals& private hospitals)along with medical facilities and government schemes available in a hospital.

B.Scenario-2:

Elderly persons at home alone, need help in their emergency situation.

Solution: By emergency care option user can click on single button to notify the ambulance services and the emergency contacts registered in our mobile application.

C.Scenario-3:

User needs help in unconscious situation.

Solution: By using (wearable object) the unconscious situated people will saved by automatic sending of notification by emergency contacts and ambulance service.

D.Scenario-4:

Poor people are not able to afford on medicine.

Solution: By using our app user can find nearby medical stores along with coupons (or) discounts available to serve this situation.

E.Scenario-5:

Emergency need of blood in critical situation.

Solution: In critical situation user can directly find nearby blood banks along with availability of blood units and also notified the user when any blood camps are conducted.

F.Scenario-6:

People are habituated to throw medicines after recovery.

Solution: By using our application unused medicines information will be collected and notify to the nearest trust people to collect and serve needy people.

3. Existing System

In existing system people reach hospitals manually in search of medical facilities, hospitals related to their disease , government schemes applicable in that hospitals in their emergency cases. It takes lots of time and effort of the persons .even though they did not get the clear information about their need . This leads in many situations they delayed of getting treatment which causes critical health issues. Due to the unawareness of the government schemes available for us people are not properly utilize medical services provided by the government.

4. Proposed System

In proposed system ,Our project will provide a solution that the person can search the medical facilities, government schemes ,list of hospitals based on their diagnosis, nearer to their current locations. We also guided the user for blood banks information in their emergency need of blood samples and medical stores nearer by them. so that the user not getting tired in search of manual process and everything is integrated in a single project.In general people is having the habitude of left the medicines aside after the usuage of medicines in middle of their treatement if they felt like they are cured .we also focusing on that side and

collect the information which is left aside and donate to the trusted people.
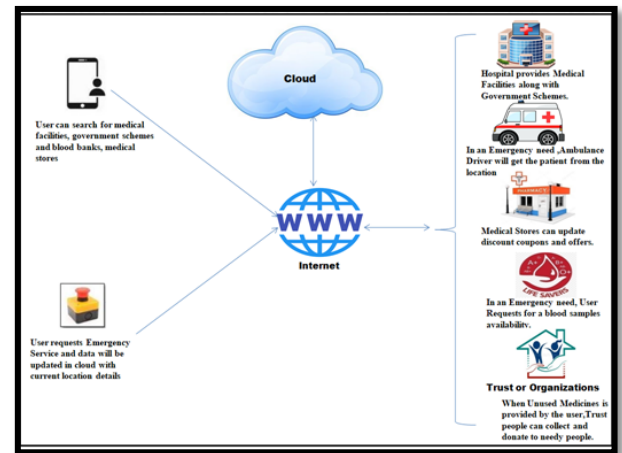
4.1 System Architecture

fig:1 system architecture

This architecture describes the work flow of this mobile based syestem. In this system people can search nearby hospitals,blood banks and medical stores.user can also search for government schemes available in that particular hospital. User can donate their unused medicine to the trust organisations by filling medicine information with their address ..the trust people can come and collect medicine from donars and give that medicine who are in needy. Due to we will reduce medical wastage.

In an emergency situation user can get assistance from the ambulance services and intimated his/her situations to the emergency contacts registered at the time registration.

4.2 Modules Description
4.2.1 User
- My Profile
- Statewise Hospital List
- Government Schemes
- Insurance schemes

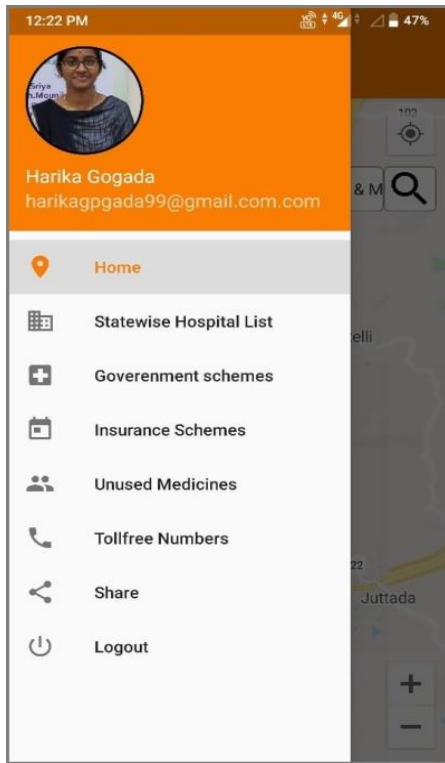- Unused Medicine
- Toll Free Number

Fig:2 Navigation screen

Fig: 4 Medicine donate screen

Fig:3 Home screen

Fig:5 Statewise Hospital List screen

Fig:6 Emergency care screen

4.2.2 Features

Search nearby medical facilities: This feature is used to display all the government schemes applicable nearby hospitals based upon the locality of the users.

Government schemes with hospital list: This will show all the government schemes existing in a state along with the hospitals.

Insurance Schemes: It will direct the user to view all the insurance schemes avail in that particular state.

Blood bank: This feature helps the user in a situation where an emergency need of blood, they can directly search nearby blood banks and find the availability of required blood group.

Pharmacies: By this feature user can search nearby medical stores along with offers and discount coupons available in stores so those users get benefited with some amount. This feature can also help the needy person who will not effort complete amount.

Unused Medicines: This option allows the user to upload the list of unutilized medicines to be donated to a trusted organization so that poor people gets help.

Notification Services: This feature will be auto enabled. User will be notified with services whenever medical camps are conducted, arrival of new government schemes and whenever user requests blood, a notification will be sent to blood banks.

Plug   and Play Services: Our system can be integrated into any other applications through plug and play module.

4.2.2 Ambulance driver Application

The following features are for the Ambulance driver application

1. Enable/Disable User Request: In this feature the ambulance authority will receives requests from the nearby users for Ambulance services if they enable the service.

2. Nearby Hospitals: Under this feature the ambulance authority can view all the nearby available hospitals to admit the patient.

3. Directions to Hospitals: This feature is used to direct the ambulance to the Hospital in GOOGLE MAPS.

4. Update Patient Status: Under this feature "the ambulance authority can update the details of the patient to the

hospital which they are going to take the patient, So that the hospital authorities can be ready with all the necessary equipment's". Hospital authorities can login and view these details.
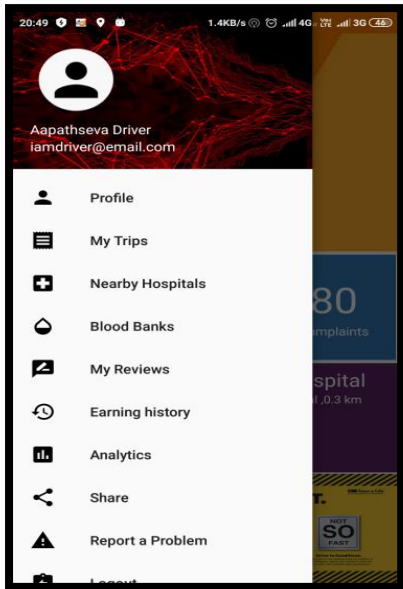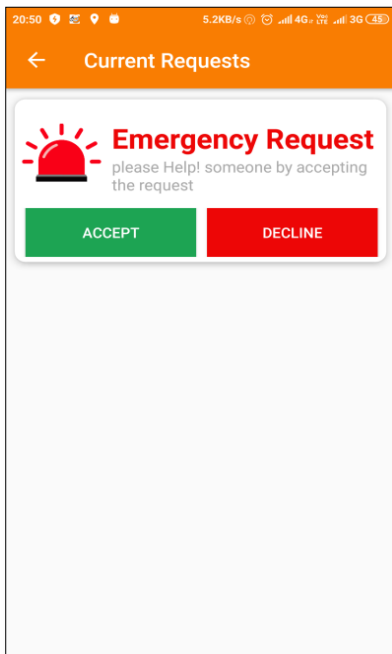

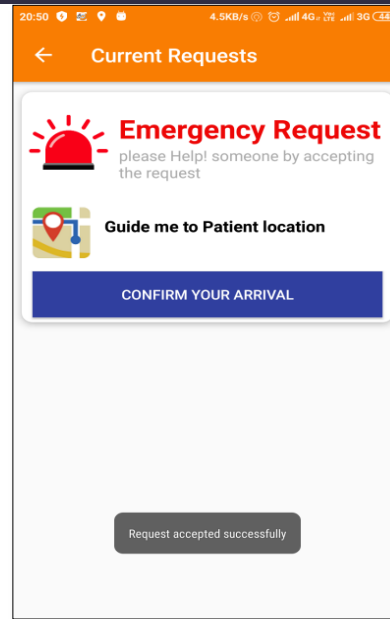**Fig:7 Ambulance driver home screen**

Fig:8 Viewing request screen
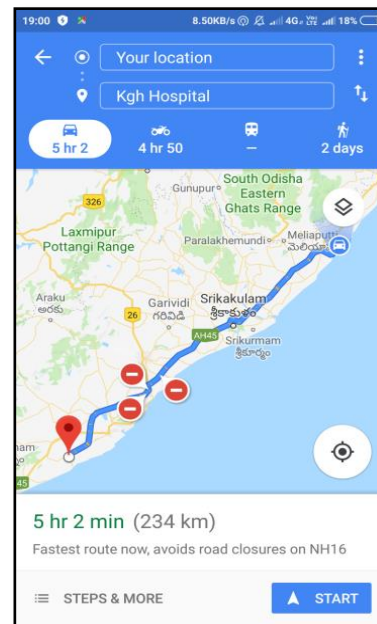

Fig:9 After accepting request screen

Fig:10 Directions to hospital screen

5. Unique Selling Point

- By using our app, the user can view nearby hospitals along with Doctors, Surgeons, specialists, medical facilities

and different schemes applicable in the hospital.

- By using our app, the user can view Government schemes availability in the state and endto-end process to avail them.
- Without installing the app, the user can use all the services through Google Voice Assistant / SMS.
- If any user has unused medicines, the user can fill the required information and request for the Collection of Unused Medicines. The same will be collected and given to the unaffordable people for free of cost.
- By using Machine Learning algorithms our app will make sure that the user will purchase the medicines at the best price by applying online coupons from pharmacies (Med plus, Apollo ...) / discounts form online payment systems (Paytm, Amazon ...) / discounts from banks (SBI, HDFC,CITI ...).
- Notifying the user with new government schemes, Medical camps, blood donation camps and requirement of blood if any.
- Our application will automatically detect the accidents by using the in-built mobile sensors and sends alert to all the nearby emergency services like bike ambulance, ambulance drivers, emergency contacts and hospitals.

6.Results

Fig:11 Schemes information screen
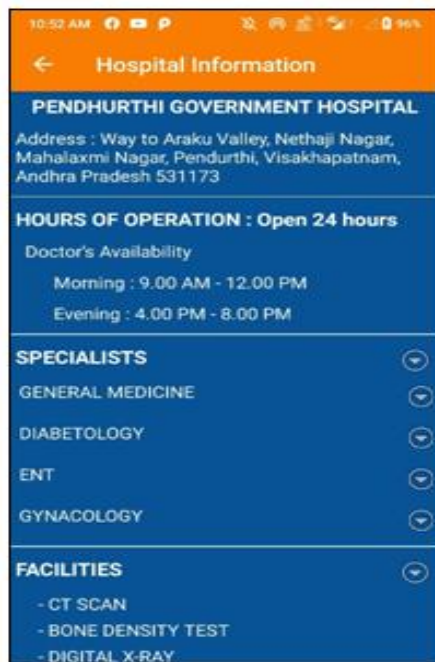

Fig:12 Schemes Process information screen
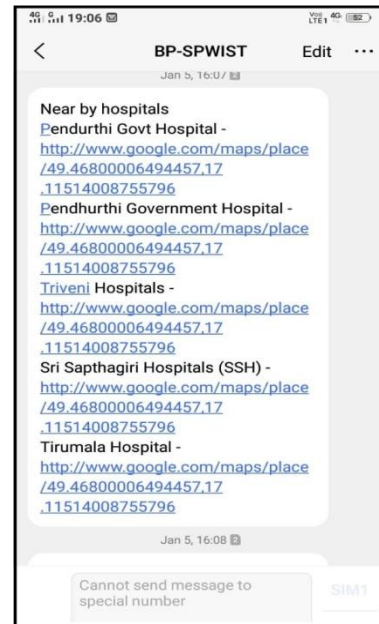
Fig:13 Hospital information screen

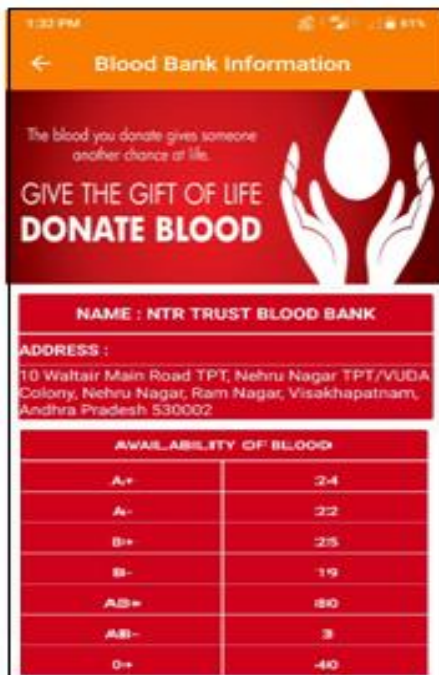**Fig:14 Nearby Blood Bank information screen**

Fig:15 Offline Message screen

7. Methodology

***Bellman-Ford algorithm* for finding nearest hospital:** Bellman-Ford algorithm is a graph search algorithm used to find shortest path from source vertex to all other vertices. The time complexity of Bellman-Ford algorithm is $O(VE)$.

Input: Graph with a source vertex src.

Output: From source vertex src it finds short distance from all the vertices .If there is any negetive distances ,are not calculated,then the weight cycle is reported.

Step-1:This step initializes distances from source to all vertices as infinite and distance to souce itself is 0 array dist[] of size v will keep these values.

Step-2:This step calculates shortest distances.Do following v-1 times.

(a)Do following for each edge u-v

If dist[v]> If dist[u]+weight of u-v then
dist[v]= dist[u]+ weight of u-v

Step-3: if there is any negative weight cycle in graph this step reports.

Do the following for each edge u-v

If dist[v]>dist[u]+ weight of u-v then graph contains negative weight cycle.

```
function bellmanFord(G, S)
    for each vertex V in G
    distance[V] <- infinite
    previous[V] <- NULL
    distance[S] <- 0
    for each vertex V in G

    for each edge (U,V) in G
    tempDistance    <-    distance[U]    +
edge_weight(U, V)
       if tempDistance < distance[V]
       distance[V] <- tempDistance
         previous[V] <- U
       for each edge (U,V) in G
               If        distance[U]     +
edge_weight(U, V) < distance[V }
       Error: Negative Cycle Exists
       return distance[], previous[]
```

Dijkstra's *algorithm* for finding shortest path(current location to desired location):

Dijkstra's algorithm is a single source shortest path. This algorithm allow us to find shortest path from any two vertices in a graph. The time complexity is O(VElogV).

The following steps are finding shortest path using dijkstras algorithm.

Step-1: Initialize the distances.

Step-2: From the starting node, visit the vertex with the smallest known distance.

Step-3: Once we have moved to the smallest cost vertex, check each of its neighbouring nodes.

Step-4: Calculate the distance/cost of the edges leading from starting vertex.

Step-5: we are checking If there distance/cost to a vertex is less than a known distance, update the shortest distance/cost for that vertex.

Step-6: Final result for a graph.

8. Conclusion

Our project helps the users to find the near by hospitals by their diagnosis and health schemes either government provided or government aided schemes. User needs not to search hospitals and specialists manually by reach the hospitals. if the person is in emergency case by single button click automatically send offline messages to emergency contacts and hospitals. By this users can save their time by getting their required information.

9. Future Enhancement

Future scope of this project is planned to be government can be planned to analyze all government medical schemes in graph representation .Based on the analysis which medical schemes are most used by the public will be given more priority and the scheme less used will be given less priority. By this analysis Government can raise more fund to the most used medical schemes by reducing the fund to the least used one.

10. References

[1] Shusaku Tsumoto and Shoji Hirano and Yuko Tsumoto, "Towards Data-

Oriented Hospital Services: Data Mining-based Hospital Management", Department of Medical Informatics, School of Medicine89-1 Enya-cho, Izumo 693-8501 Japan.

[2]Shusaku Tsumoto, Shoji Hirano and Hidenao Abe, "Temporal Data Mining in History Data of Hospital Information Systems," Department of Medical Informatics, School of Medicine,Shimane University89-1 Enya-cho Izumo, Shimane 693-8501 Japan.

[3] S. Tsumoto. G5: Data mining in medicine. In W. Kloesgen and J. Zytkow,editors, Handbook of Data Mining and Knowledge Discovery, pages 798–807., Oxford, 2001.

[4] Hanumanthappa.J, Dr.Manjaiah D.H, "A Study on Contrast and Comparison between Bellman-Ford algorithm and Dijkstra's algorithm" by Thippeswamy.K.

[5] S. Tsumoto, S. Hirano, and Y. Tsumoto, "Clustering-based analysis in hospital information systems," in Proceedings of GrC2011. IEEE Computer Society, 2010.

[6]"Information reuse in hospital information systems: A data mining approach," in IRI. IEEE Systems, Man, and Cybernetics Society, 2011, pp. 172–176.

[7] S. Tsumoto," Automated induction of medical expert system rules from clinical databases based on rough set theory", Information Sciences, 112:67–84, 1998.

[8] S. Tsumoto,"Extraction of experts' decision rules from clinical databases using rough set model", Intelligent Data Analysis, 2(3), 1998.

[9] S. Tsumoto,"Knowledge discovery in clinical databases and evaluation of discovered knowledge in outpatient clinic", Information Sciences, 124:125–137, 2000.

[10] Shusaku Tsumoto,"G5: Data mining in medicine", In W. Kloesgen and Jan Zytkow, editors, Handbook ofData Mining and Knowledge Discovery, pages 798–807. Oxford University Press, Oxford, 2001.

[11]An Efficient Algorithm To Detect The Nearest Location Of A Map For A Given Theme M. A. P. Chamikara, Y. P. R. D. Yapa, S. R. Kodituwakku, J. Gunathilake.