

SANJEEVANI: A CENTRALIZED WEB- PLATFORM FOR MEDICAL FRATERNITY AND SERVICES.

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Abstract -- Nowadays, with a busy lifestyle people of all age group combat with health-related problems. Also searching for suitable blood groups and medicines in an emergency situation is strenuous task for family members which requires maximum time and human effort and sometimes becomes very critical that may cost the life of the patient. Therefore, HealthCare has become an obligatory need of every family. To solve health related problem, we propose a Web based platform to ease the process of finding suitable blood groups from nearby Blood Banks in the area. Also, the application finds generic and its substitute medicine from pharmacies available in the area using Real time Location of the respective user/s through GPS. Subsequently, it reduces paperwork on daily basis of hospital blood banks by maintaining a database that will work in real-time for blood record maintenance. Also, doctors and patients can connect through online chat facility where queries can be solved in real-time and also provide digital prescriptions to them. We also provide a Management Information System to track their daily activities and generate reports for further analysis.

Keywords: GPS, Generic Medicine, Healthcare System, Emergency Medical Supplies, Web based application, Management Information System.

1. INTRODUCTION

Every citizen of the country visits the doctor or hospital in his lifetime for different health related reason. In order to treat the patient doctors, prescribe drugs which may be generic or unique which is purchased from a medical shop. Searching for specified medicine and blood groups during emergency situations or on daily basis have become a very agitated task[1]. It is often seen that patient has to visit several medical shops to fetch the prescribed medicines as he is unaware of different options for a drug salt available to him. Also, users do not have the feature where they can access the details of medicine available in different pharmacies and locate them.

Hospital faces scarcity of blood during emergency situation and they do not have any facility to record and update their blood inventories in a database system because till now they use the manual method. Two years back on 8th September,2017 in Kharbanda Medical Hospital many people lost their lives as they were supplied with expiry blood units for their needs. Furthermore, "Approximately 6 lakhs liters of blood was wasted in one year due to poor interconnection between hospitals and blood banks."

Also, there is no facility available for faster and efficient communication between doctors and their patients giving transparency to locations or distance. Therefore, an application can developed wherein the prescription from a doctor is digitalized and directly transferred to patient or caretaker who may have an app to assess the options and availability of the drug in the vicinity/city. This may require linking all brand names for a drug/ salts in the database which may be available to the users. Simultaneously this database may be linked with availability of such drugs at different medical shops which can be identified by a map. This project also deals with Inter Hospital Blood Transaction in which when hospital faces scarcity of blood in their hospital during emergency, they could efficiently use our web application and contact other hospital for bloods without causing any trouble to the relatives of the patient to suffer from finding the blood and matching blood groups roaming around from one hospital to another [1],[5]. This will largely help in Health Care Department of any hospitals to maintain their records of blood bank in real-time basis and also create a transparency in the system of hospital and their will not be any corruption in name of blood donation or such things at all.

In this paper, a web-based application is proposed which deals in providing a handy and hustle free health care system. The reason for choosing web-based platform is that in India, every single citizen has access to internet and web application provides better user experience with responsive design. It's a lot easier and cheaper to make a web-based system user friendly system across multiple platforms and various screen resolutions. Our main motive is to provide user satisfaction which is the prime priority by means of rapid and continuous delivery of useful workable web application [1],[2]. By making such a platform we are able to save human efforts and time which was wasted in searching for medical emergency supplies.

The following features would help the members to save good amount of time and make their task easier. These features were not combinedly done in any previous works:

- Users can interact with the Registered Doctors through the chatroom facility and can get the digitalized prescription.
- Users and Doctors can find the prescribed drugs and its substitute availability in the nearby pharmacy.
- Hospitals as well as Users can find the nearby blood banks for the required quantity of blood using our system.
- Registered Hospitals can maintain their blood inventories record in our centralized database.
- Registered Pharmacies can also maintain their sales, customers and product record in our database.
- Registered Doctors will get the facility to store their patients records in the database.
- We also provide a Management Information System to track their daily activities and generate reports for further analysis.

We discussed about some relevant papers in Section II. In Section III we have described the hierarchical diagram explaining the system functionality with system architecture. We have showcased the sequence diagram focusing the user's interaction with the Doctors. Section IV contains some limitations and future scope for development of our system and finally, we conclude our paper.

2. LITERATURE REVIEWS

We have found many such health care systems available in market whose documents we have selected and effectively evaluated. The author in [1] described about a web application wherein they provide a centralized database to store the blood inventories details and also provide nearby hospital for emergency need.

The author in [2] proposed the system which will show all the details about the medical stores and medicines as per the user requirement. The real time location of user is tracked by using GPS (Global Positioning System). The GPS tracking is done by GPS enabled android mobile that transmits the location to the server through the GPRS. Through this application user come to know the name and availability of generic medicines in different chemist stores.

In paper [3], author examine a high-level design of a perceived medical system and determine the implications of adding patients as active contributors. They proposed a systematic approach to support scaling health care systems while preserving system integrity. Distributed systems such as personal health records and eHealth systems provide two ways in which patients can become more involved with their own health care with or without the involvement of health care professionals.

The study in [4] is focused on developing an efficient blood inventory management model to reduce the platelet shortages. The blood banks were managing platelet inventory according to their own instincts with their experiences. Therefore, the need for an efficient system which optimize the inventory levels while minimizing the shortages is a vital need. This proposed model manages the daily supply of platelets by forecasting the daily demand.

The paper [5] introduces the review of the main features, merits and demerits provided by the existing Web-Based Information System for Blood Banks. This study shows the comparison of various existing system and provide some more idea for improve the existing system.

3. IMPLEMENTATION OF SYSTEM

In this module, the system architecture and the interaction of the members with the system is described using several UML diagrams.

A. System Architecture:

The web application uses a Three Tier architecture system which consists of a web server, members and a centralized database. The web application requires internet connection for updating data and for getting modules current location to provide them with nearest medical stores and blood banks, and for providing a faster and efficient communication between doctors and the users. The system consists of five different members: Administrator, User, Doctor, Hospital and Pharmacy [6],[7]. The Administrator section is for approving that whether the registered members are authentic or not, and also admin can generate and update the information regarding the medicines and their distinct substitutes that are recently accessible in market. And the server will provide several distinguished features for the other 4 modules that will authorize them to get quick and essential healthcare. The system architecture is shown in Fig 1.

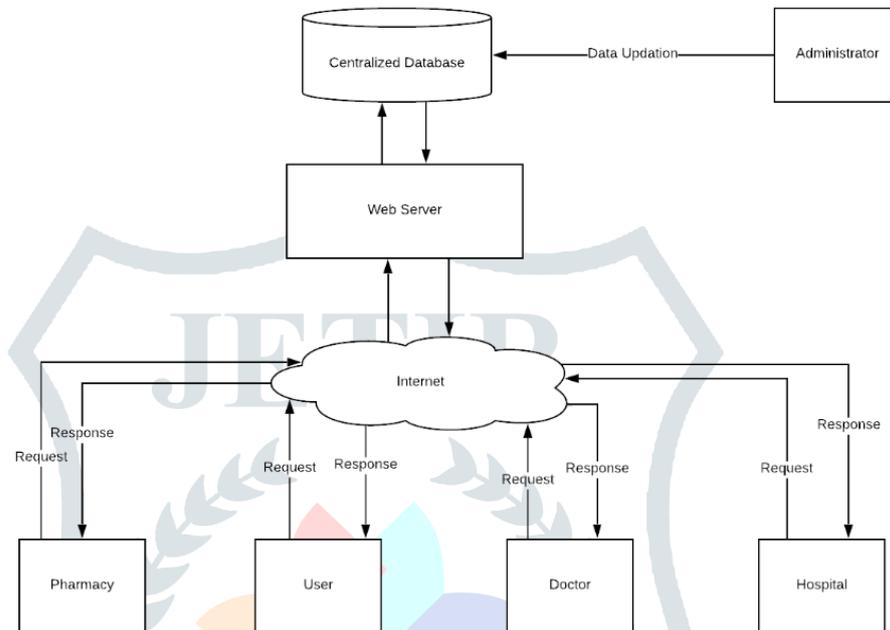


Fig 1: System Architecture

B. Technology Used:

- Front-end development technologies are: Bootstrap 4, HTML 5, CSS 3, JQuery. These technologies are used to provide features like artistic designs and clean visual appearance to the website.
- User interaction and engagement can be achieved via JavaScript, JQuery, etc.
- Back-end development technologies involves PHP 7.2 which brings a wide scalable dimension for smooth running website on any devices.
- Also, usage of different security features like SSL Certificate, HTTPS Protocol, Anti-Hacking MD5, etc. may ensure safety of website. All the details of Enquiry, Contact Info, Web Access Info etc. will be scripted in MySQL Database.
- Features like MVC & CMS will constitute the Back-End Architecture of the website.

C. Overview of the system:

The hierarchical diagram in Fig 2. describes the tasks and the subtasks involved in achieving the goals of the system.

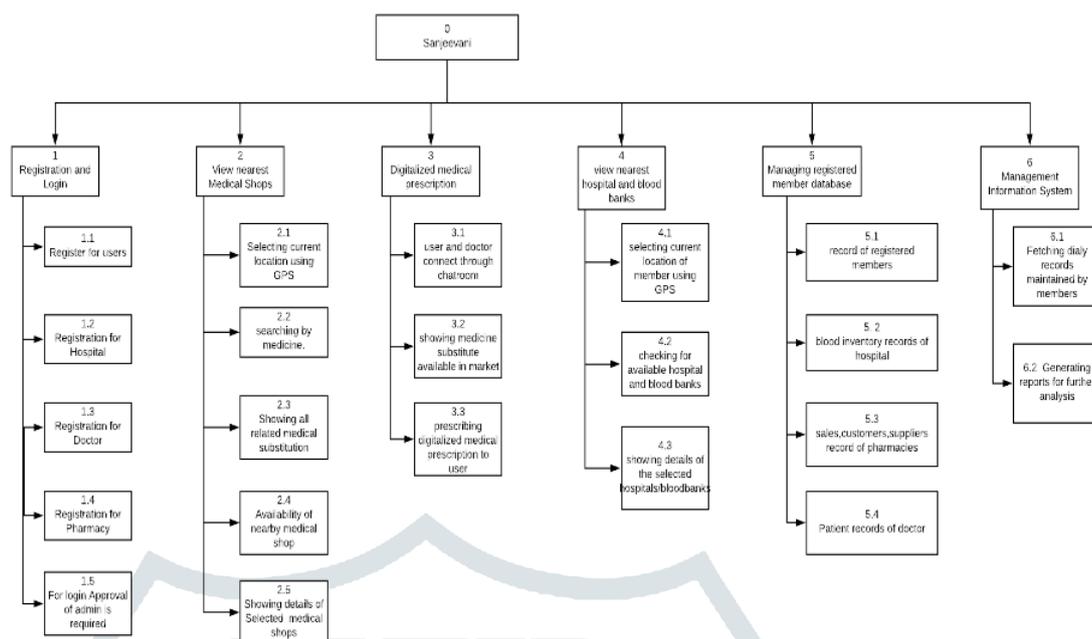


Fig 2: Hierarchical Diagram

➤ Registration and Login:

When any member wants to have the access to the system facilities, he needs to first register in our system. The registration process involves updating the database with the member details such as Name, email id, Contact number, Password, Address and member type. There are 5-member types: Admin, User, Hospital, Pharmacy, Doctor. By using the member's address, the system will extract the information like latitude and longitude which will help to locate the user and provide them with different facilities using GPS. After registering, the member will login by providing his username, member type and password. If the entered details are valid then the system will check the status of the member i.e. whether the Admin has approved the member for using the system or not. If the status is approved then the system will open the respective member's dashboard wherein, they can access the different facilities.

➤ User Dashboard:

Users of our system can be Patients, Care-taker or the General public. The system will provide the user with different facilities to make their daily medical and during emergency situation much easier which are as follows:

- Viewing nearby Hospitals or blood banks through Maps facility where the several details are asked to user such as which blood type is needed, and the quantity of blood units required. By fetching the user's current geographic location through GPS, the system will provide the list of different nearby hospitals and blood banks blood with precise location present on Google Maps. Out of the retrieved list, operator will select any one blood bank or hospital which satisfies the requirement and then the system will provide the detail information about that respective option selected.
- Viewing Nearby Pharmacies through Maps facility where the user needs to enter which medicine is required in how much quantity. Then the system will fetch the user's current geographic location through GPS and will provide the nearby pharmacies products details. Out of the retrieved list, operator will select any one pharmacy which satisfies the requirement and then the system will provide the detail information about that respective option selected.
- Searching the substitute of different medicines available in the market [7],[10].
- Chatroom Facility is provided to interact with the registered doctors. The interaction between a user and a doctor is described in Fig 3.

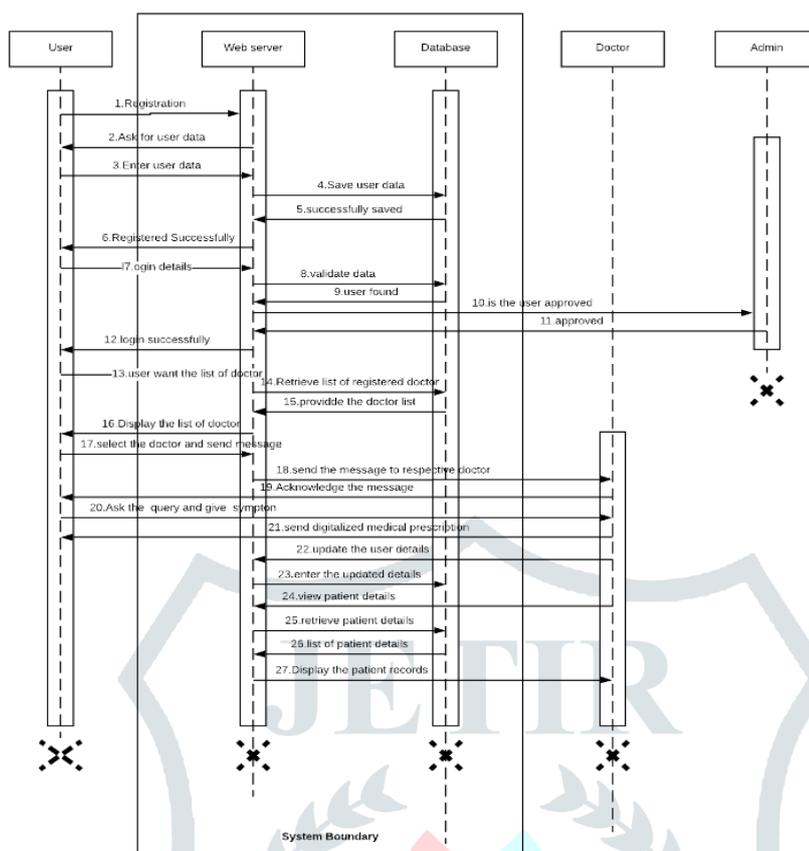


Fig 3: Sequence Diagram for interaction between the Users and the Doctors.

➤ Doctor Dashboard:

Registered Doctors will be having several facilities provided by our system which will help them to make their daily activities much easier and also by using our system they may perform task such as;

- Patients record storage facility where the doctors can store their patients records like; Patient Name, Contact Number, Status of the patient i.e. if the treatment of the patient is ongoing or finished and the start date of the treatment [7].
- Chatroom Facility where the doctors and the user will interact with each other and after processing the patient's symptoms the doctor will send the digitalized medicine prescription to the respective user.
- Doctors can Search different medicines substitute available in the market before prescribing the drugs to the patients.
- Reports are generated for further analysis using the patients records to track the daily activities of the doctor.

➤ Pharmacy Dashboard:

Our system will provide different facilities to the registered pharmacies such as;

- Pharmacy can store and update different records like their customer records, products records as well as their suppliers' records [8].
- To track their daily activity reports are generated for further analysis by using the record maintained by the pharmacy.
- Pharmacy can fetch the provided digitalized prescription by the doctors via username of the patients and then the pharmacy can provide the mentioned drugs to users [8],[11].
- Also, after providing the drugs, pharmacy can generate the invoice of the medicines and provide it to the users.

➤ Hospital Dashboard:

To overcome the difficulties faces by the hospitals like manually storing the blood inventories record and not having the information about the availability of blood units in different hospitals and blood banks, our system will provide them with features like:

- Storage facility is provided where the hospital can maintain and update their blood inventories records in our database [9].
- Viewing nearby hospitals and blood bank when in need for blood units. The system will fetch the hospital’s current geographic location through GPS and will provide the details of the required blood type and quantity available in the nearby hospitals and blood banks which can be identified by a map. Out of the retrieved list, operator will select any one blood bank or hospital which satisfies the requirement and then the system will provide the detail information about that respective option selected.
- We also provide a Management Information System to track their daily activities and generate reports for further analysis.

4. SCREENSHOTS OF THE SYSTEM

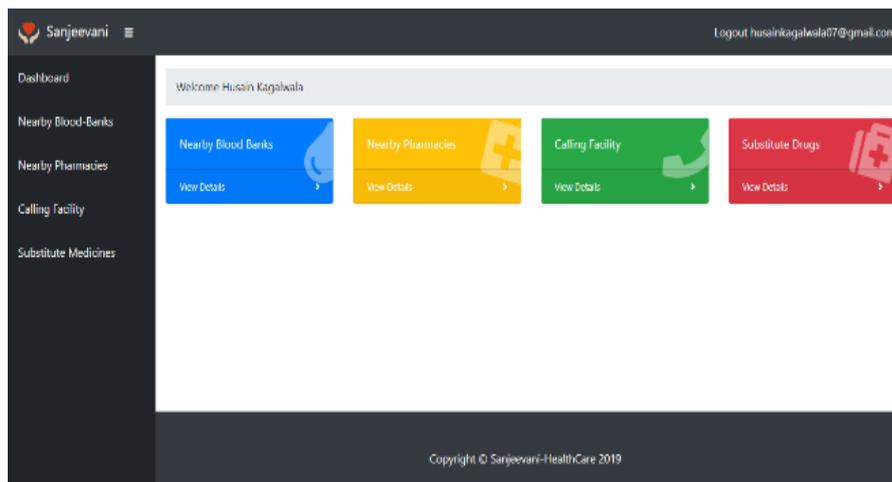


Fig 4: User Dashboard

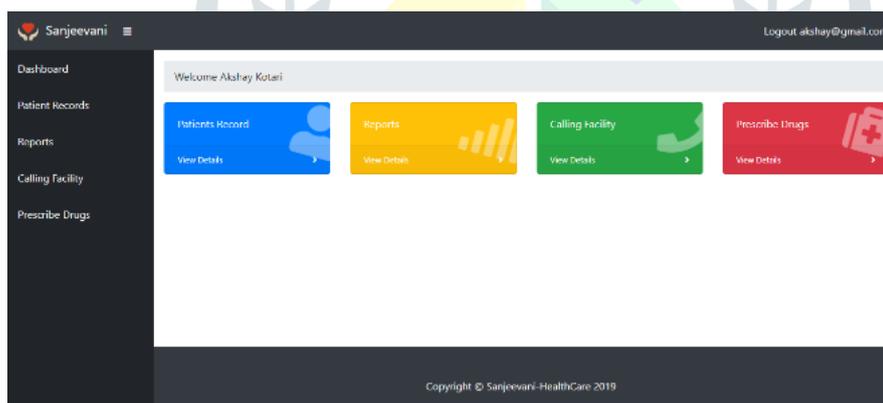


Fig 5: Doctor’s Dashboard

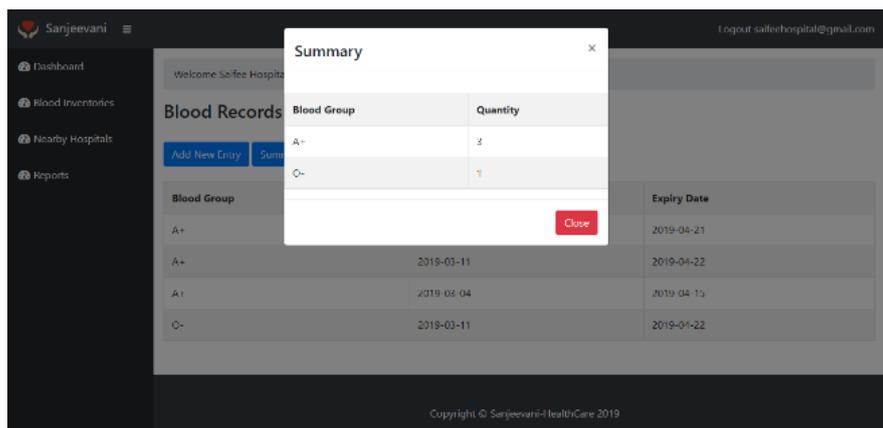


Fig 6: Blood inventory page for Hospitals

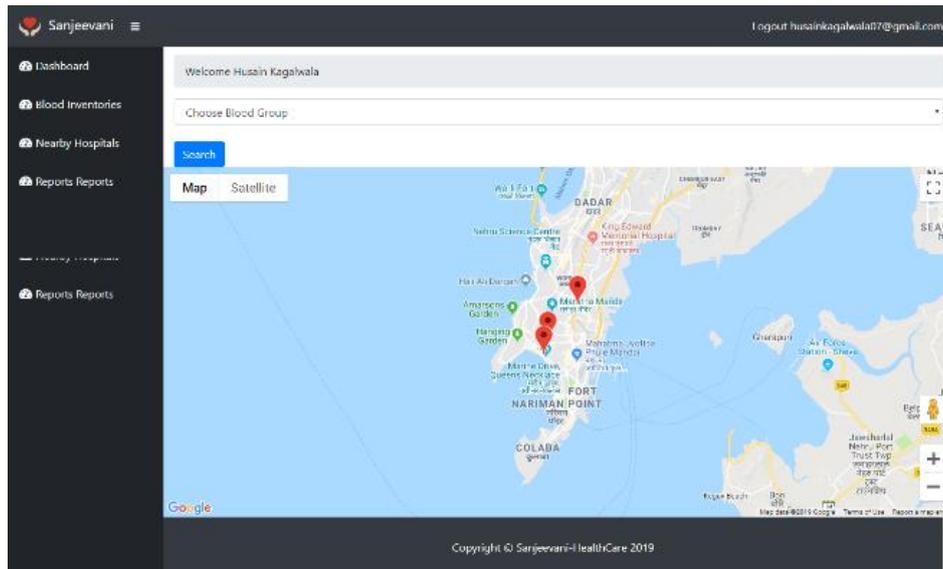


Fig 7: Nearby Hospitals and pharmacies being viewed.

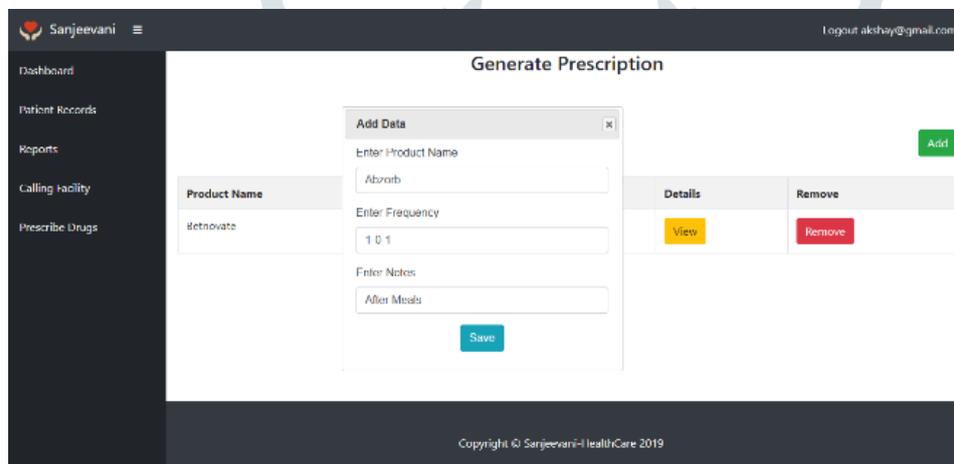


Fig 8: Prescription Generation from Doctor Side

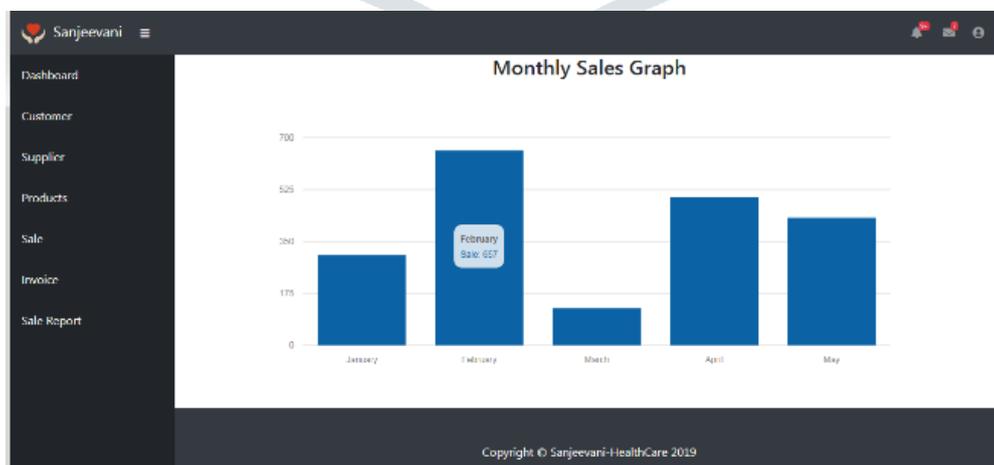


Fig 9: Graphical representation of monthly analysis.

5. CONCLUSION

Our main aim was to develop an integrated system for healthcare which was not available till date. All functionalities were present on different platforms but we have provided a unique ideology by integrating these functionalities for making day to day task simpler and efficient of our members who are registered with us [12].

The importance of this web application can also be further elaborated as this system provides a monthly or yearly analysis of their respective data which they are storing in our database which will help them to provide an overall view of their activities.

6. FUTURE WORK

The scope of the project can be extended further before introducing this web application to the medical sector. To upgrade the system performance, we can add more features such as;

- Adding Blood donation feature wherein the registered users can donate their blood in the required hospitals or blood banks and they can then track their blood units using the UIDAI link from our website, so that there will be no corruption of the blood units in hospitals.
- Also, during emergency situations wherein it becomes difficult to find the organ donor or any organ donating organizations for the patients who need various organs for transplant, our platform will be handy for such a situation wherein the list of the available nearby organ donation centers is provided to the users.
- By integrating Machine Learning and Image Processing, we can give Doctors an extra feature in which by just providing symptoms of a patient, they could easily detect which disease a patient is suffering from.

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