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The Development of Blood Bank Application

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Abstract: The process of managing the blood bag that is received from the blood donation events needs a proper and systematic management. The blood bag must be handled with care and treated thoroughly as it is related to someone's life. The development of Pakistan Blood Bank Application is proposed to provide a management functional to the blood bank in order to handle the blood bag. In Pakistan most of the big cities don't have any blood banks which can help to manage the blood bags. This web-based management system was developed to meet the requirements for Hospitals available in the Lahore, city of Punjab, Pakistan. The technology platform in implementing this system uses Brackets programming environment with php and XAMPP server, using MySQL for SQL database and HTML5, CSS and JavaScript for web development.

Keywords: Blood Bank System, Web Based, Blood Management

1.   Introduction

Blood transfusion safety is very important to every hospital and other medical facilities. Need to design a system who will be a responsible for managing blood bags first to end date. A system which mange all the data of donors and accepters also system will response for managing all the category of the blood. System can generate trigger to all the donors who have specific blood category that short in our blood bank. We will provide individual portal to different receptions which integrated with our system or collaborate with of system.

Blood Bank is known as the blood collection center in the hospitals or collection of blood in bags and preserved for the later use in the transfusion services. Blood transfusion is known as the medical treatment that is required to save a life. In a report Ministry of Health in its website, it is stated that more that 1.5 million pints of blood are donated each year. Blood donation and blood transfusion services include collecting, processing, storing, and preparing human blood, pre-transfusion testing, and cross-matching and final injection of the patient. Therefore, in general, the blood bank system includes a blood-dependent station responsible for collecting, storing and distributing human blood, in addition to a hospital blood bank that provides blood transfusion services. Due to the lethal nature of the blood and its blood components, the entire process from blood collection to refrigeration must be fully controlled, monitored, and recorded.

Firstly, when a needy person needs a particular blood type that is not available at the current bank, the first option to utilize is the social media to search for the donators and who can volunteer to donate the blood, but this is quite time consuming which may cause the death of the patient. Secondly, during the donation of blood doctors doesn't know about the patient medical history which can also affect the bag contamination along with the transfusion safety. Thirdly, to keep the records of the blood bags in the bank is quite difficult to manage as this won't let the managers to know the about the blood reserve. They will only get alert when it finishes. This could lead to serious problems. Along with that the managers are not aware of each bags expire date and if the expired blood is donated to a patient that will cause the serious problem for the patient.

The objectives for this project are, Firstly, design a Blood Bank Application based on structured approach. Secondly, develop a Pakistan Blood Bank Application and Lastly, to test the Pakistan Blood Bank Application.

The application Blood Bank Application is going to maintain all the process and activities that are handled by the blood bank management. There will be three basic operations this application will perform which are, donor registration, monitoring the blood bags and monitoring the blood bag issuance.

2.   Related Work

Two similar system has been studied and compared with the proposed system. The first system is Blood Bank India and Loins Blood Bank & Research Foundation.

There are three structures that have been picked as benchmark for the headway of BBI. The site for Blood Bank India is a site that gives the workplace to the supporter to enlist without help from anyone else as a blood patron. Only occupant in India can select to the structure. It moreover gives a part where an individual or crisis facility can request the blood pack or blood stock from the Blood Bank India.

LBBRF is a private affiliation that limits as a spot to give blood. They give a charge to the individual or patient that is in necessities of blood. Regardless, the money that they accumulated isn't for the advantage for them yet for recover the expenses achieved in choosing and educating patrons. This is moreover to ensure that the blood holding is just similarly secured as could be anticipated. In Lions Bank and Research Foundation, they will guarantee the openness of blood stock in their blood gift focus. They similarly conveyed the current status of blood stock in their site presentation page. This is for them to keep the site visitor especially sponsor educated concerning the necessities regarding blood. They furthermore enlighten the provider, and the public where and when is their next event. In any case, this blood gift focus doesn't give any office to the advocate and the patient. Thusly, they can't know how frequently that they have given their blood. Regarding the provider, they can't have even the remotest clue about their blood assessing result for each time they give their blood. Without having this capacity in the framework, the contributor can't screen their ailment.

The proposed system is called Pakistan Blood Bank System will help to manage this Application an administrator is required who is going to give access to each user of the hospital. It will store the donor data and its history in the database. And ensure that the blood present in the bank is not expired or outdated. This will ensure the management of blood bag issuance and gives an alert when the inventory is reduced to a particular quantity. And it will be able to identify the donor when a certain blood group is required. System will be managing all the recodes all the bloods categories and email to the users.

Table 1: Comparison

Features/System	Blood Bank India (BBI)	LBBRF	Pakistan Blood Bank Application
Login Module	√	√	√
Registration module	√	√	√
Expiry Management	√	X	√
Attractive user interface	X	√	√
Donor Alert	X	X	√
Reservation module	X	X	√

3.   Methodology/Framework

We are choosing spiral ring model for this developing of system the benefit of this model is that first we analyses the risk management the we will start development in every phase we will identify all the risk of failure of system and back to back test of every module.

Figure 1 Prototype Model

There are total of nine phases from the prototype model. As shown in Table 3.1, each phase has its own assignment and output that need to produce during the entire project development. Besides that, the output had been completed within the specific days that have been given.

Table 2: System Development Workflow

Phase	Activity	Deliverables
Planning phase	Identifying problem, scope, and objectives. And then find out how to build the application and its features based on the data collected	The proposal and Gantt chart
Analysis phase	Gather information and analyze them	Use case, activity diagram, sequence diagram
Design phase	Develop the system to include all the functions and features.	Code program, application, test case
Implementation Phase	Develop the system to include all the functions and features.	Code program, system/apps database, and test case.
Documentation phase	Discussion on what documentation should be created for future reference and maintenance.	Final report.

4.   Results and Discussion

The analysis phases and design phases of the object-oriented model. the results of the analyses and system design can ensure that the detailed description of the system can meet the needs of the stack holders. The importance of the projects is to make sure that the proposed application achieves the objectives and works accordingly and all modules activities that have been developed. Along with that it will ensure that the database design works accordingly to store and visualize the data.
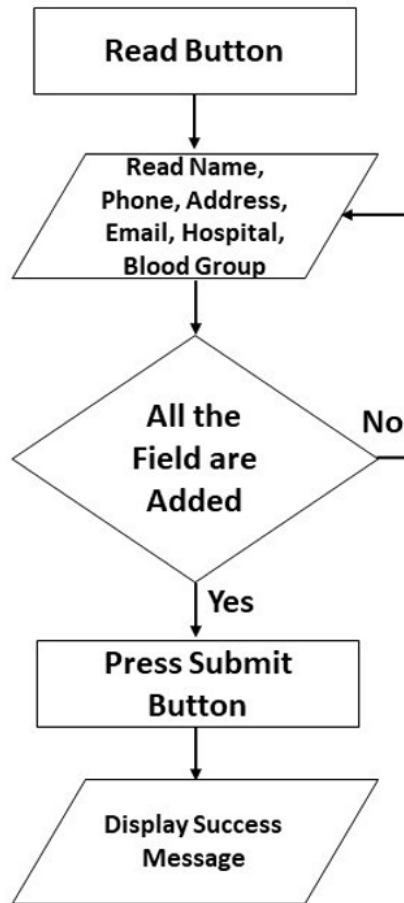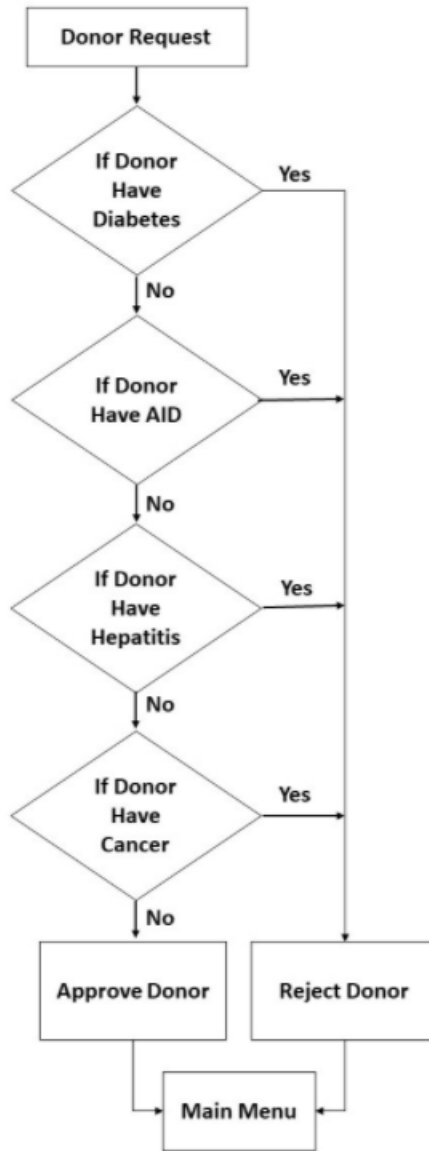
Figure 2 Donor Registration
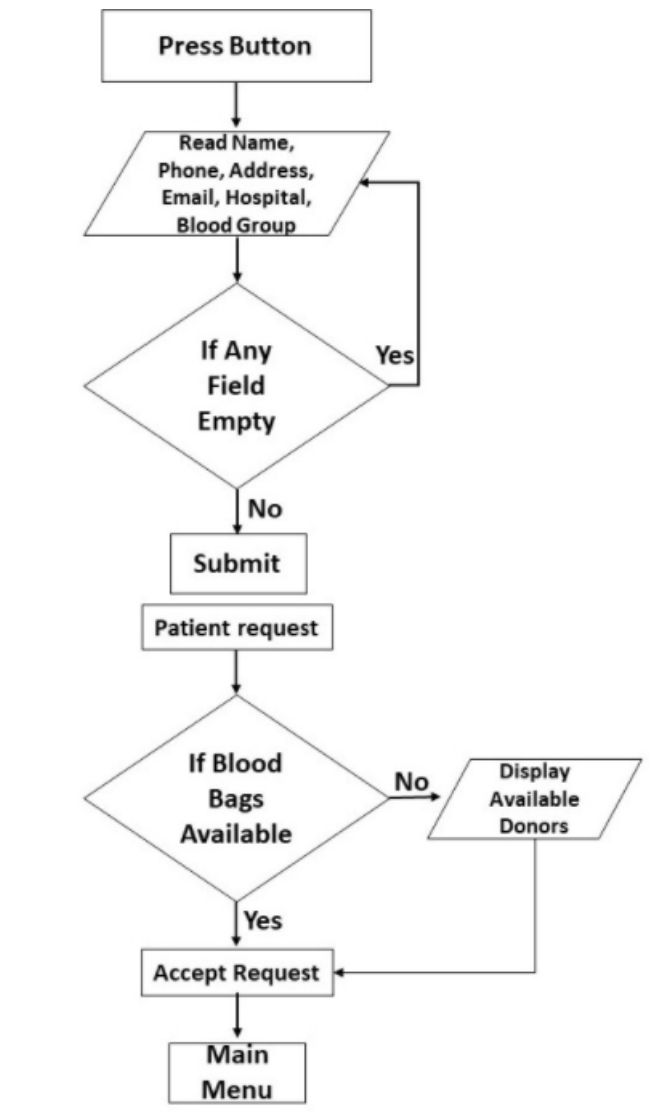
Figure 3 Donor Acceptance

Figure 4 Adding patient

UML Diagram in Figure 3 shows the main process which is Pakistan Blood Bank Application and the three main entities in the process which are Donor, Receptionist and Manager as well shows the flow of data in general on the system
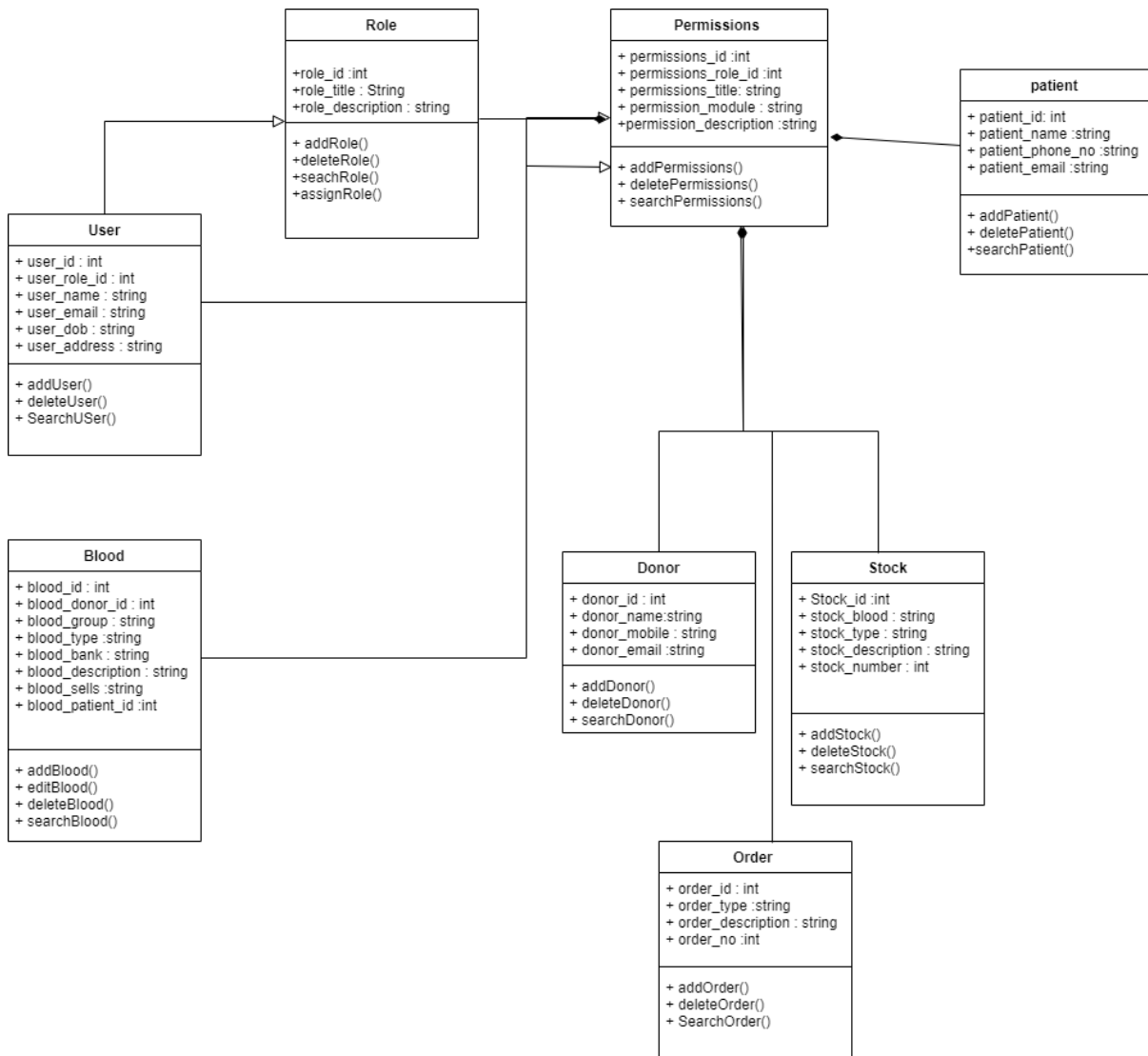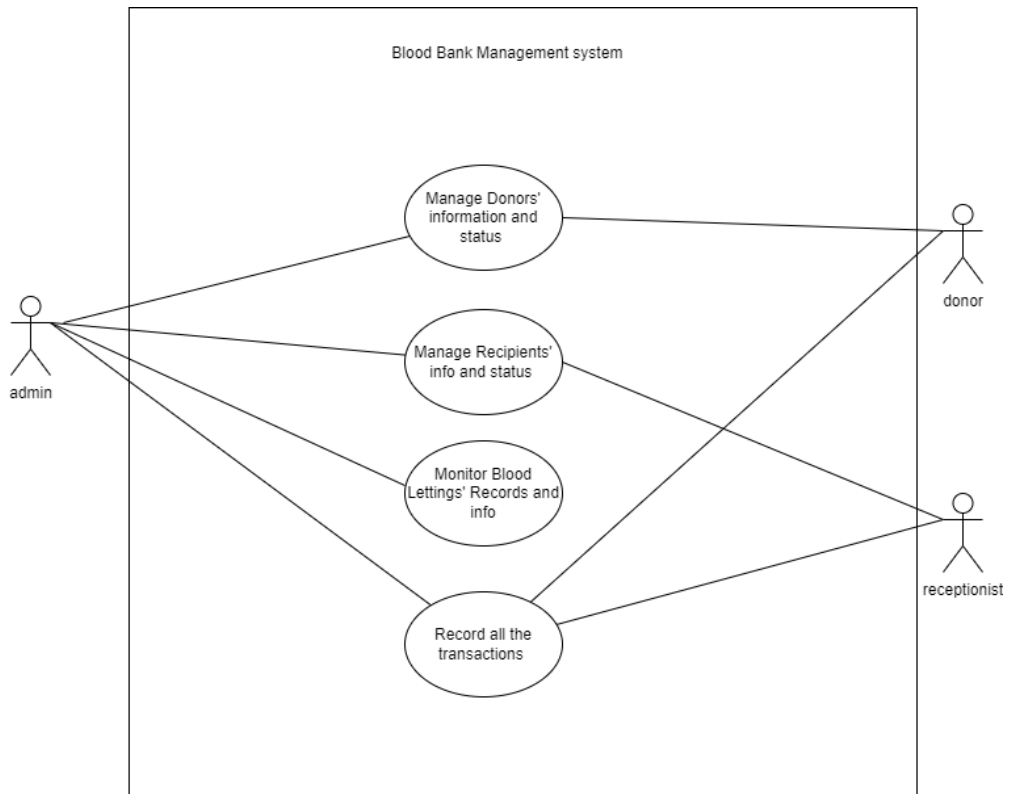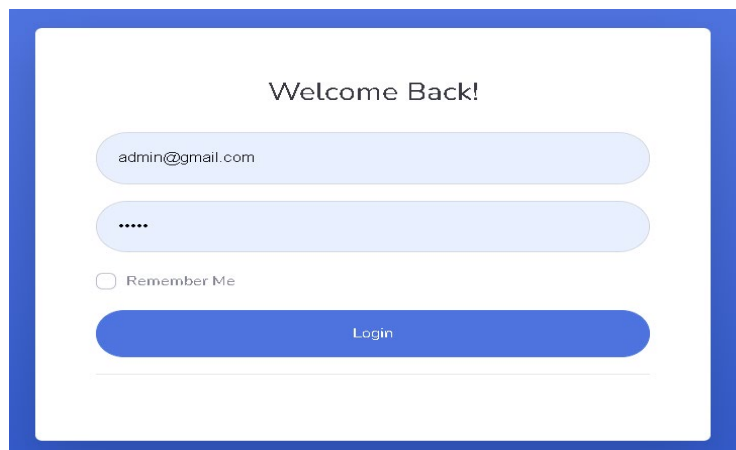
Figure 5 Class Diagram

Figure 6 Use Case Level 0

System Interface

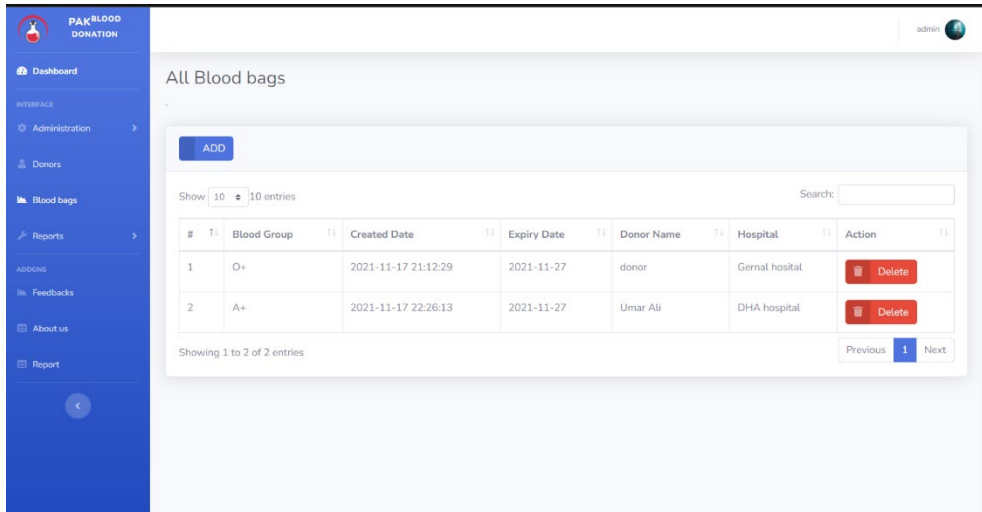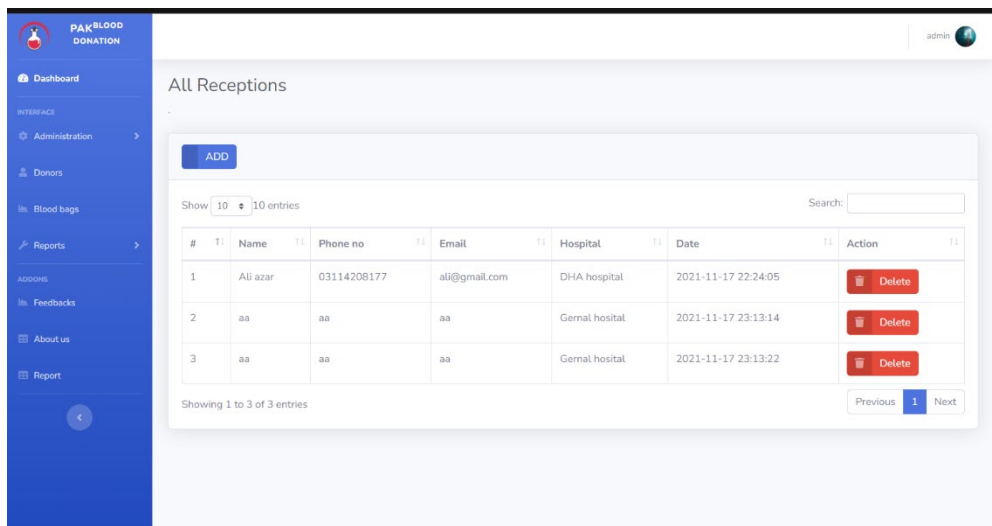*Figure 7 Login Page*
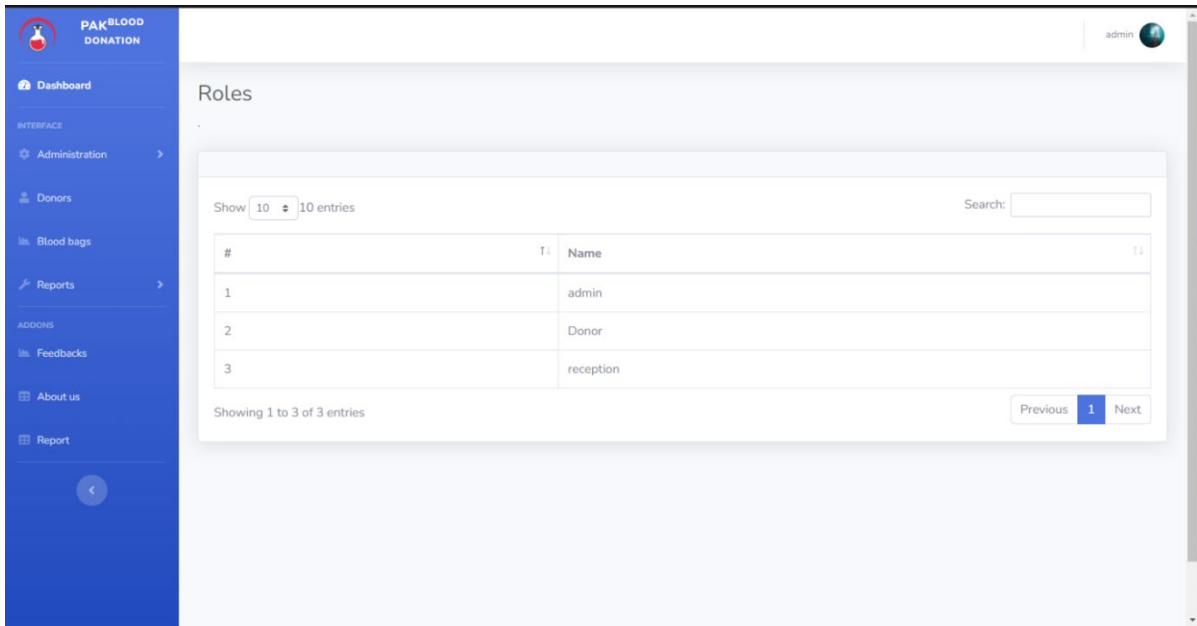
Figure 8 Actors / Roles
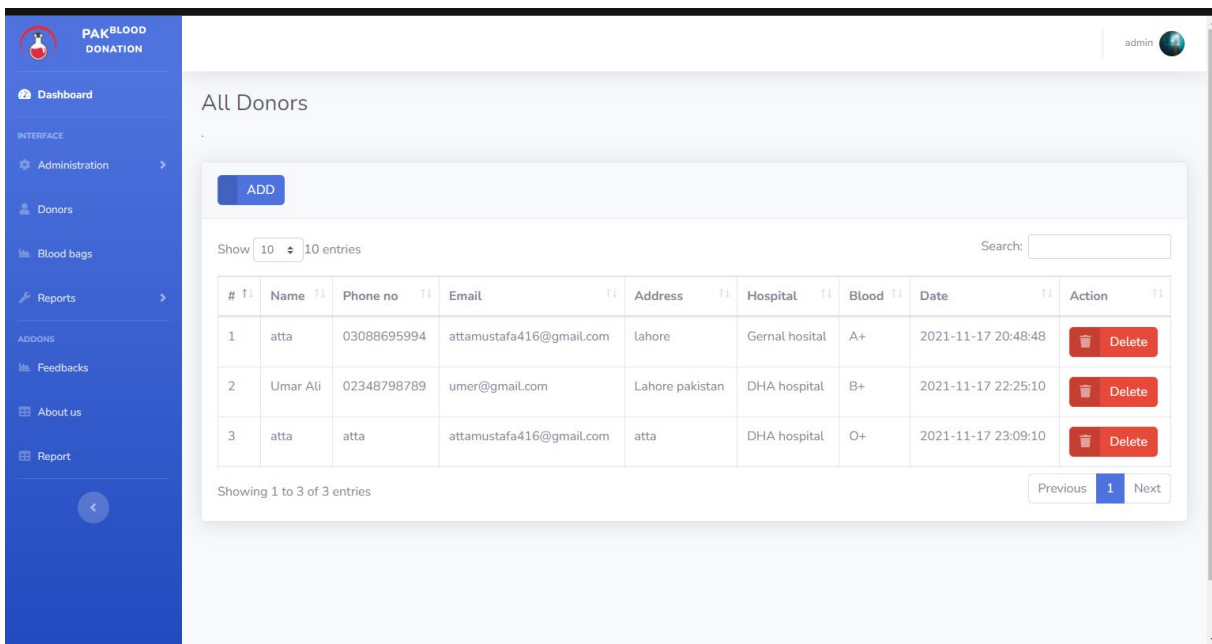
Figure 9 Donor

Figure 10 Blood Bags

Figure 11 Receptionist
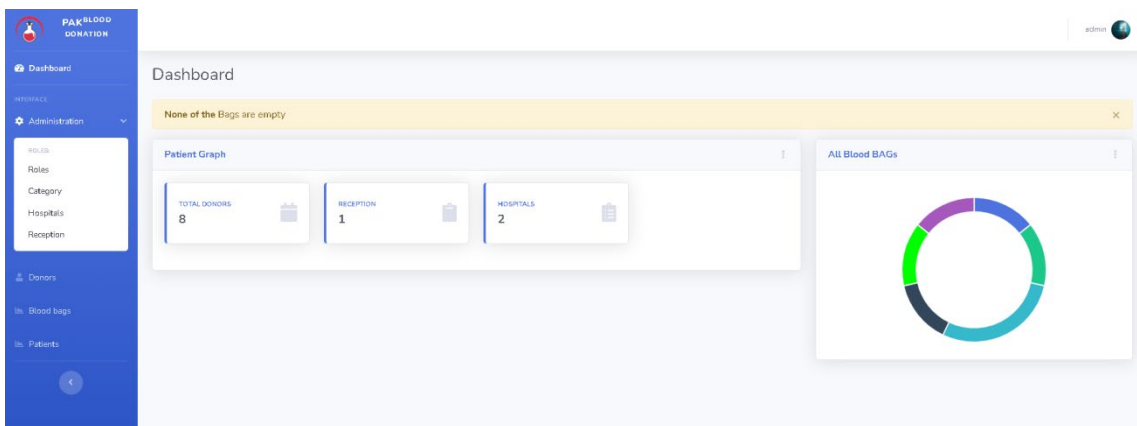
Figure 12 Patient

Figure 13 Dashboard

5. Conclusion

As conclusion, the Section I described the objectives of this application and problem statements that need to fix. besides that, describes the project objective. Section II describes literature review and the related work on profiling and classification models such Blood Bank India, LBBRF, and the explanation for proposed system. Section III presents the methodology spiral ring model for the Pakistan Blood Bank Application. Section IV shows the analysis and design for the system also Section IV will show the UML Diagram, Use Case Diagram, and the Database Specification for the system. Finally, Section V shows the Design Interface for the application.

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