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LIFESTREAM – A DEMO BLOOD BANK APPLICATION

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ABSTRACT

Blood donation is a critical aspect of healthcare that saves millions of lives annually. However, challenges such as lack of real-time information, inefficient coordination, and limited user engagement hinder the effectiveness of traditional blood donation systems. To address these issues, we developed "LifeStream – A Blood Bank App," a demo Android application designed to streamline the process of finding and managing blood availability efficiently. The app integrates user authentication, blood request processing, and a structured blood bank database to provide a smooth user experience. Although it does not operate in real-time, it effectively demonstrates the potential for automated blood stock tracking and notifications for blood drives. This research explores the design, implementation, and benefits of the LifeStream app, highlighting how it improves accessibility and efficiency in blood donation management

Keywords: Blood Bank App, Android Development, Blood Stock Management, Firebase Database, User Authentication.

I. INTRODUCTION

Blood donation plays a crucial role in healthcare, yet many individuals struggle to find blood banks with available stock, especially during emergencies. Traditional methods of searching for blood donors through manual calls or outdated records are inefficient and time-consuming. To solve this issue, mobile-based blood donation applications have emerged as a modern alternative.

The "LifeStream – A Blood Bank App" is a demo solution designed to enhance accessibility by allowing users to:

1. Search for blood availability in various blood banks.
2. Submit blood requests, which are automatically checked against available stock.
3. Receive a calculated bill, including a fixed ₹100 delivery charge.
4. Enable blood bank admins to manage users and blood inventory.

This paper presents the design, methodology, implementation, and evaluation of the LifeStream app, along with its benefits over traditional systems.

Liu & Zhang	[8]	AI-powered blood donor matching	Requires complex AI data training
Patel & Joshi	[9]	Location based donor search	Accuracy issues in remote areas
Kumar & Prasad	[10]	Comprehensive mobile health system	Lacks specialized blood donation features

II. RELATED WORK

Several mobile applications have been developed to improve blood donation processes. These studies highlight the importance of efficient blood donation systems but also expose gaps in automation, usability, accessibility that our app aims to address.

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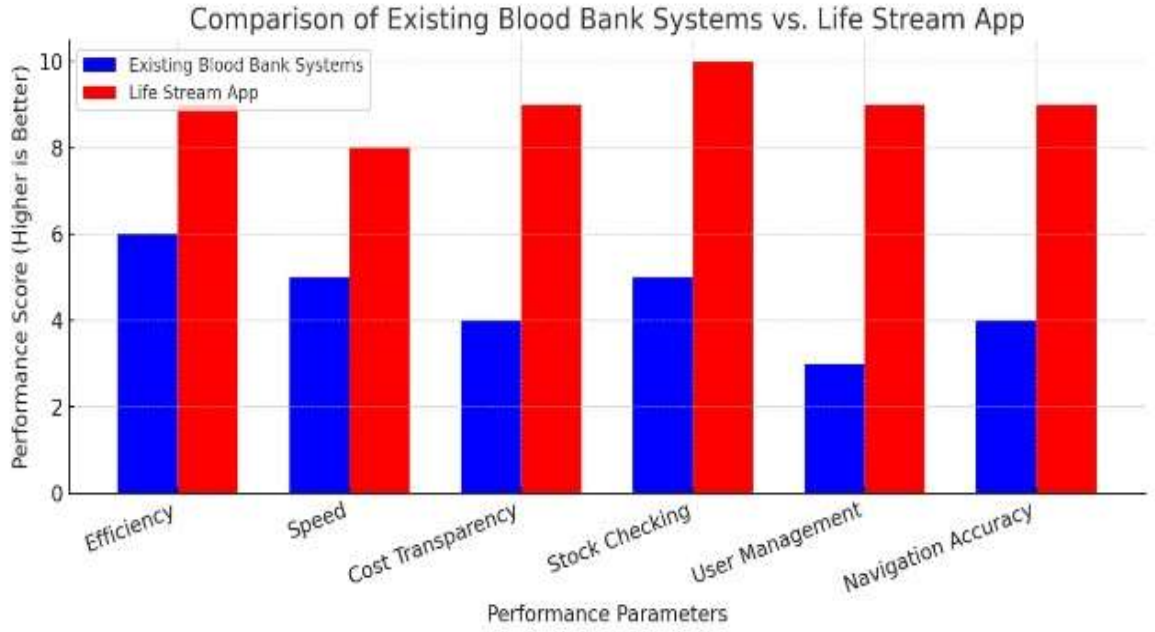
Study	Reference	Key features	Limitation
Kumar etal.	[1]	Android app for donor registration and blood research	No real time blood availability tracking
Ekin & Kochak	[2]	Community-based donation app with event tracking	Limited donor-recipient coordination
Babadic etal	[3]	Scheduling and reminders for donor participation	Users may ignore frequent notifications
China & Chiang	[4]	Donor tracking and event management	No support for real-time blood stock updates
Gupta & Chatterjee	[5]	Mobile based blood donation scheduling	Notification overload for users
Saha & Chattopadhyay	[6]	User registration and blood request notifications	Requires large backend infrastructure
Vishwakarma & Sharma	[7]	User engagement through educations content	Over-reliance on push notifications might lead to disengagement

These studies highlight importance of efficient blood donation systems but also exposes gaps in automation, usability and accessibility that our app aims to address.

III. LIMITATIONS IN EXISTING SYSTEMS AND OVERCOMING CHALLENGES

Limitations in Existing Systems	How "LifeStream" overcomes this challenges
Manual Blood Bank Coordination	Automated stock verification before confirming requests
Lack of Standardized Charges	Fixed 100 Rupee delivery charge for transparency
Difficult User Navigation	Simplified UI with Dark/White mode selection
No User Role Management	Admins can view and delete users if necessary

Current blood donation management systems face multiple limitations , which we have overcome in LifeS tream



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Aspect	Existing System	Proposed System
Efficiency	6	9
Speed	5	8
Cost Transparency	4	9
Stock Checking	5	10
User Management	3	9
Navigation Security	4	9

IV. METHODOLOGY

4.1 System Design

The LifeStream app is built using client-server architecture with:

1. Frontend: Android Studio(Java)
2. Backend: Firebase Firestore for data storage and user authentication
3. Database: Firebase stores blood bank stock details, user requests and donor records.

The system follows a modular approach making it scalable and easy to update

4.2 Workflow Implementation

The app workflow is divided into user workflow and admin workflow:

4.2.1 User Workflow

1. User Login & Mode Selection: Users select White Mode or Dark Mode after login.
2. Home Screen Navigation: Access to

Blood Donation Form

Blood Recipient Form

Blood Bank Search

Blood Donation Camp Updates

Health Tips & Settings

3. Blood Request Submission: Users submit a request specifying blood type & quantity.
4. Stock Verification: The system checks Firebase for stock availability
5. Bill Calculation & Confirmation: A fixed ₹100 charge is added, and the bill is displayed in a dialog box.
6. Final Confirmation: Once confirmed, the blood bank database is updated accordingly.

4.2.2 Admin Workflow

Admins can manage users (view details & delete users).

Future expansion will allow admins to manage blood inventory

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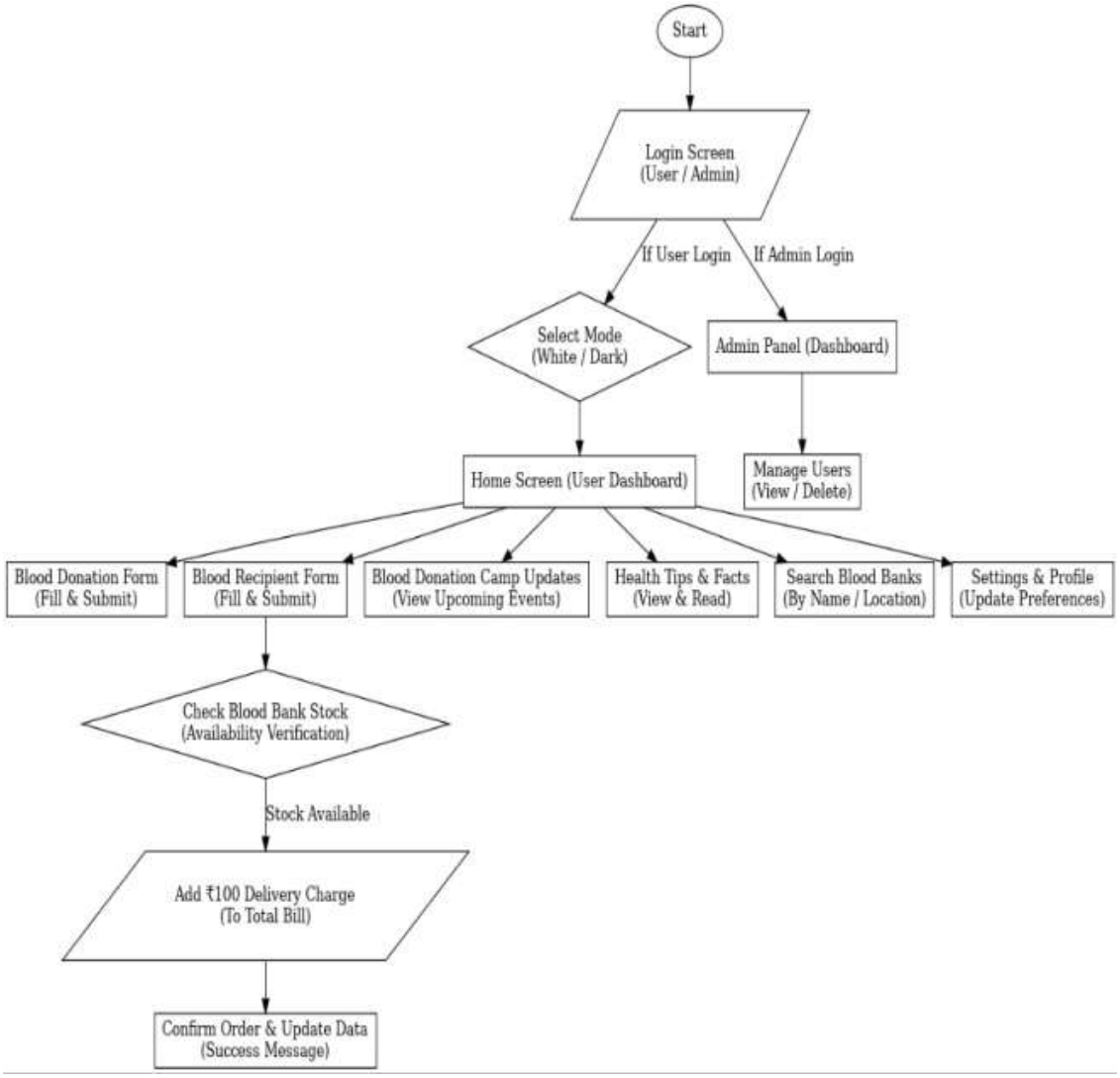

Fig: Work Flow of LifeStream app

V. RESULTS AND DISCUSSION

The "LifeStream – A Blood Bank App" effectively demonstrate a structured automated approach to blood donation management.

5.1 Key Findings

1. Improved Efficiency : Faster stock verification compared to manual systems.
2. User Engagement: A clean, user-friendly interface with accessibility modes.
3. Scalability: Firebase-based architecture allows future upgrades like SQL integration.

5.2 Challenges & Limitations

While the app improves blood request processing, a few challenges remain:

No real-time GPS tracking of blood banks (planned for future updates).

VI. CONCLUSION

The "LifeStream – A Blood Bank App" presents a structured, efficient, and user-friendly approach to blood donation management. The app overcomes major limitations in traditional blood bank systems by automating blood stock verification, user authentication, and request processing.

Although it currently operates as a demo, its scalable design allows future enhancements like real-time donor notifications, integration with hospital blood banks, and expanded admin functionalities.

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VII. FUTURE SCOPE

1. Integration with an SQL Database for advanced blood inventory tracking.
2. Automated Notification System for urgent blood requests.
3. Expanded Admin Panel for inventory management.

This research confirms that digital blood bank management systems can revolutionize the way donors, recipients, and blood banks interact, making the process more accessible, reliable, and efficient.

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