

DONAPP: A Centralized Platform for Bridging the Gap between Donors and Recipients



Shilpi Singh¹, Saurabh Sambhav¹, Vinayakumar Ravi^{4,*}, Apurva Arya¹, Tahani Jaser Alahmadi^{5,*}, Prabhishkek Singh² and Manoj Diwakar³

¹Amity School of Engineering and Technology, Amity University, Patna-801503, India

²School of Computer Science Engineering & Technology, Bennett University, Greater Noida, Uttar Pradesh, India

³Department of Computer Science & Engineering, Graphic Era University, Dehradun, Uttarakhand, India

⁴Center for Artificial Intelligence, Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia

⁵Department of Information Systems, College of Computer and Information Sciences, Princess Nourah bint Abdulrahman University, P.O. Box 84428, Riyadh 11671, Saudi Arabia

Abstract:

Background: This work proposes the development of a donation application to tackle the lack of awareness regarding local NGOs, orphanages, shelter homes, and hospitals in need of donations. The aim is to bridge the gap between donors and recipients by creating a centralized platform that facilitates communication and streamlines the donation process.

Objectives: The primary objective of the application is to connect donors with recipients efficiently and effectively. Specific features include location-based search, push notifications for urgent donation needs, user profiles to track donation history and preferences, and information on the impact of donations and the organizations involved.

Methodology: The development process involves designing and implementing various features to ensure user-friendly navigation and seamless interaction. Incorporating location-based services, push notification systems, and robust user profile management are key aspects of the methodology.

Results: To test the effectiveness of DONAPP, we conduct simple, informal user surveys that are provided to various stakeholders. These surveys are designed to assess the app in both an objective and subjective manner. The survey results show that the proposed donation application has the potential to significantly increase donation rates and save lives by connecting donors with recipients. Enhanced transparency and trust-building mechanisms, such as providing information on donation impact and participating organizations, contribute to the effectiveness of the application.

Conclusion: In conclusion, the development of this donation application addresses the critical issue of lack of awareness and inefficiency in the donation process. By leveraging technology to connect donors with recipients, the application aims to foster a culture of giving and contributing to positive social impact.

Keywords: Centralized platform, Application, Donation, Software, User-interface, Human and disease, Health system.

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*Address correspondence to these authors at the Center for Artificial Intelligence, Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia and Department of Information Systems, College of Computer and Information Sciences, Princess Nourah bint Abdulrahman University, P.O. Box 84428, Riyadh 11671, Saudi Arabia; E-mails: vinayakumarr77@gmail.com, tjalahmadi@pnu.edu.sa

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1. INTRODUCTION

India is known as the land of celebrations be it in terms of largely celebrated festivals, the occasional celebrations, or the big fat Indian weddings. On every occasion celebrated, there is a large amount of food that goes to waste because of overproduction and less consumption. According to the Food Waste Index Report 2021 by the United Nations Environment Program (UNEP), It has been found that 50kg of food is either wasted or thrown away by each person in India, every year. The food wasted in India is alone worth rupees 92000 crores. In contrast to this, more than 5000 people die due to hunger per day. Several parts of the Indian population suffer the consequences of food waste, a major issue in India. Individuals, organizations, governments, and NGOs have all taken a lot of initiatives in this area. In the long run, these efforts do serve a purpose, but they cannot reach a large number of people in need since they are not scalable. The benefits of these initiatives are therefore not accessible to many people. To be successful, these initiatives and efforts must be conducted systematically. Each area or locality has stray animals [1]. When dealing with foods, all the foods may not be edible for humans but edible enough for animals. Apart from these, some people want to donate some food to feed stray animals. These stray animals also suffer from starvation. A stratum of society, say rag pickers or daily bread earners for instance suffers from malnutrition and are poorly dressed. Another instance could be death caused by a delay in the blood supplied to the patients. A person's contribution to saving the life of another through blood donation is one of the most symbolic acts one can perform. An individual unit of blood can have a life-saving effect on a patient undergoing a road accident, undergoing major surgery, or undergoing long-term blood therapy or chemotherapy. Regular blood transfusions are required in patients with anemia and thalassemia [2]. A patient usually gets blood from a friend or family member when he or she needs it. Some organizations hold food donation drives for stray animals but until and unless the people are connected to the organization, they won't be aware of such drives [3, 4]. In all the above cases, an approach to solving these problems could be connecting the donors to the people in need of resources *via* an Android application platform. The problem will be solved more effectively on a larger scale as a result.

The remainder of the paper is organized as follows. Section II describes the motivating scenario that motivates our study. Section III reviews the background study and related works. In section IV, we discussed the system model and problem formulation and in section V the proposed model is described. Section VI shows the experiments and results obtained. Section VII concludes the paper and highlights some future work.

2. MOTIVATION AND PROBLEM FORMULATION

On observing the daily life of people in our surrounding or locality we came to know that 8 out of 10 people face a problem when it comes to donation.

Generally, if we see in our locality, someone who wants to donate something they struggle on the street to search for underprivileged children, ragpickers, or people living in slum areas. Another way for people to donate was to become a part of Ngo to donate things. Most of the time they can't find anyone in need to donate or they don't know any nearby NGOs who are willing to accept what they have for donations as a result people find it easier to throw the food, clothes, or other items rather than struggling to find the place for donations. Being a part of the same community, we too faced the same issue. During winter people die on the street due to lack of warm clothes and empty stomachs. On one such cold day, we decided to donate some blankets to the people or to any organization that was going to conduct a blanket donation drive. At that time, we faced the problem of finding an organization nearby that would be willing to accept these, there was no way or there was no centralized application where we could find the organization according to the requirements. Likewise, some people have faced similar issues in finding someone to donate food or blood or any other stationary item, so we came up with the idea of a centralized application that will provide a platform for both donors and receivers to connect based on their mutual requirements with four different categories for donations *i.e.* food, blood, cloth and stationary donation. The proposed application prototype helps donors to easily create a donation request to nearby organizations with one click eliminating the lack of knowledge of the organization in need of those donations and the struggle to roam on streets, knock door to door to find the receivers who are willing to accept or in need of these donations.

That sounds like a great idea! A centralized application that connects donors and receivers based on their mutual requirements can make the donation process easier and more efficient. Such an application could help bridge the gap between those who want to donate and those who are in need and could potentially lead to more donations and a greater impact on the community. It is important to ensure that the application is user-friendly and accessible to everyone, regardless of their technical abilities or resources. This could involve designing a simple and intuitive interface, providing clear instructions and guidance, and making the application available on multiple platforms and devices. In addition, it is crucial to establish trust and accountability within the system, to ensure that donations are going to legitimate organizations and individuals who are in need [5]. This could involve implementing verification processes and safeguards, such as background checks, reviews, and ratings.

Overall, a centralized donation application has the potential to make a positive impact on the community by streamlining the donation process and connecting donors with those who are in need. With careful planning and implementation, such an application could be a valuable tool for social good.

3. MATERIALS AND METHODS

3.1. Literature Survey

Here are some research papers and articles related to such kind of applications:

“Blood donation and Life saver-blood donation app” by Hamlin and Mayan [1] discusses the development of a mobile application called Life Saver, which aims to encourage blood donation by making the process more accessible and convenient. The app allows users to register as blood donors, find nearby blood donation centers, and receive notifications when their blood type is in high demand.

“BDonor: A Geo-localized Blood Donor Management System Using Mobile Crowdsourcing” by Das *et al.* [2] presents BDonor, a geo-localized blood donor management system that uses mobile crowd-sourcing to connect blood donors with patients in need of blood. The authors highlight the importance of blood donation and the challenges associated with traditional methods of blood donor management, such as low blood stock, limited accessibility, and lack of awareness. BDonor addresses these issues by using mobile crowdsourcing to identify potential blood donors and connect them with patients in need of blood in their geographic vicinity.

“Foodernity: A Mobile and Web Application for Food Sharing” by Morilla *et al.* [3] presents “Foodernity”, a mobile and web application designed to promote food sharing among individuals and organizations. The app aims to reduce food waste and hunger by connecting food donors with beneficiaries. The authors provide a comprehensive overview of the app's features, including user registration, donation posting, donation claiming, and user feedback.

The paper “Aahar-Food Donation App” by Mathur *et al.* [4] describes the development of a mobile application that enables users to donate excess food to NGOs and charitable organizations. The authors highlight the issue of food wastage and the need to reduce it by making use of technology to connect donors and recipients.

The research work “SeVa: A Food Donation App for Smart Living” by Varghese *et al.* [6] presents a mobile application called SeVa (Serve and Value) that aims to reduce food waste and promote food donation. The app is designed to connect individuals or organizations that have surplus food with those in need.

The paper “Blood Donation and Life Saver-Blood Donation App” by M R Anish Hamlin and Albert Mayan J [1]. discusses the development of a mobile application called “Life Saver” that is designed to help increase blood donations in India. The authors note that there is a shortage of blood in India and that many people are unaware of the importance of donating blood. The app is intended to raise awareness of the need for blood donations and to make it easier for people to donate.

The paper by Ali *et al.* [7] introduces a Blood Donation Management System aimed at enhancing the efficiency and effectiveness of blood donation processes. The system

encompasses various features including donor registration, blood type tracking, inventory management, and appointment scheduling, all designed to streamline blood donation activities. By providing a centralized platform for donors, recipients, and healthcare professionals to interact and coordinate, the system aims to improve the overall management of blood donation activities, ensuring timely access to safe and compatible blood units while minimizing wastage.

The paper by Almeida and Cunha [8] presents a digital donation platform designed for nonprofit and charity organizations, aiming to enhance their outreach and fundraising efforts. The platform leverages information communication technologies to facilitate seamless and secure online donations, fostering engagement and support from a wider audience.

The paper by Singh and Sharma [9] presents the development of an Android application aimed at facilitating book donation. The paper outlines the implementation of the application, which likely involves features for users to easily donate books and connect with potential recipients. The technology's potential benefits for promoting book sharing and improving access to educational resources are discussed.

The paper “G-GET: All in One Donation App” by Ranjani *et al.* [10] presents G-GET, a comprehensive donation application to streamline the donation process by providing a centralized platform for users to contribute to various charitable causes. Through an intuitive interface, G-GET facilitates convenient donations to multiple organizations, enhancing user engagement and promoting social impact. The app's potential implications for increasing charitable giving and its role in leveraging computational science and technology are explored.

The paper “Order n Eat” [11] by Sivakumar *et al.* presents an Android app developed during the COVID-19 pandemic, utilizing Firebase as its backend. The app aims to facilitate food ordering and delivery services, catering to the increased demand for contactless transactions during the pandemic.

In addition to the above academic articles, the following is an elaboration on several of the existing donation platforms that we surveyed before proposing our new platform, the summary of the existing donation applications is provided in Table 1.

4. PROPOSED MODEL

Here's a basic flow diagram (Fig. 1) for a donation application:

4.1. Sign Up

Users will create an account with their details, such as name, email, and phone number.

4.2. Choose Donation Category

Users will select the category of donation they wish to make, such as food, clothes, blood, or other items.

4.3. Create a Donation Request

Users will create a donation request, providing details about the items they wish to donate, such as quantity, type, and condition.

4.4. Search for Beneficiaries

The app will suggest nearby organizations or individuals who require the specific items being donated.

4.5. Connect with Beneficiaries

Users will be able to connect with the suggested beneficiaries through the app and arrange for the donation to be picked up or dropped off at a convenient location.

4.6. Track Donations

Users will be able to track the status of their donations, from creation to delivery, through the app.

Table 1. Existing donation platforms.

Donation App	Category	Foundation Year	Features	Limitations
GiveIndia	Fund Donation	1999	They accept clothes and other donations for various causes and distribute them to the underprivileged.	These organizations do not have dedicated apps for clothes donation, and the donation process may vary depending on the trust or NGO.
Akshaya Patra	Clothes and other donations	2000	They accept clothes and other donations for various causes and distribute them to the underprivileged.	Not have dedicated apps
Blood Donor	Blood	2013	Simple and easy-to-use interface, allows users to find donors and request blood donations.	Limited user base in some regions, may not have the latest features compared to newer apps.
Oye Happy	Clothes	2014	A gifting platform that allows users to donate clothes as part of its "Give for a Cause" initiative. They work with NGOs to distribute clothes to the needy.	Clothes donation may be limited to certain occasions or campaigns.
Feeding India	Food	2014	Feeding India has a wide network of volunteers and partners across India, making it easier to reach out to beneficiaries in various locations. They focus on food recovery and redistribution from weddings, events, and restaurants, reducing food waste significantly.	The app's availability and outreach might vary in some remote areas of India, limiting its impact in certain regions.
Robin Hood Army	Food	2014	Operates on a volunteer-driven model and has a strong social media presence, allowing it to gather more support and engagement from the community.	Its operations may not be as consistent or scalable in all regions. Coordination and logistics may pose challenges during large-scale food distribution efforts.
No Food Waste	Food	2014	user-friendly interface, enabling easy donation of excess food by individuals and businesses. It focuses on reducing food wastage at the source by connecting donors and beneficiaries directly.	The app's presence and coverage might be concentrated in specific urban areas, potentially limiting its reach to rural regions.
BloodConnect	Blood	2015	Wide network of registered donors, easy search and request feature, user-friendly interface	Some regions may have limited coverage, but regular updates are essential to ensure the best user experience
India Food Banking Network	Food	2016	IFBN is a collaborative effort that works with various food businesses, charities, and NGOs to ensure efficient food collection and distribution. It has a more structured approach to food donation and food banking.	The app's user base and operations might not be as widespread as some other more well-known platforms, leading to potential gaps in coverage.
Jeevadayini	Blood	2016	Connects donors and recipients effectively, allows emergency blood requests, provides contact details of donors	May require frequent updates for better functionality and user engagement
Klotho	Clothes	2017	Klotho is a social enterprise app that connects donors with NGOs and underprivileged communities. They focus on recycling and upcycling clothes, promoting sustainability.	The availability and reach of Klotho's services may be limited to specific cities or regions.
Sewa	Blood	2017	Extensive database of donors, quick access to blood donors, works in various cities across India	User feedback suggests occasional technical issues and may require regular maintenance
Blood-4-Life	Blood	2018	Provides a platform for voluntary donors, an easy registration process for donors, and recipients.	Smaller user base compared to some other popular apps, limited coverage in certain regions
Friends2Support	Blood	2019	Large donor database, real-time notifications for blood requests, user-friendly design	Some users have reported occasional delays in response times
Eco-Trunk	Clothes	2019	An app that facilitates the donation and exchange of second-hand clothes. They aim to promote sustainable fashion and reduce textile waste.	May not be as extensive as larger platforms, so finding recipients for your donations could depend on local demand.

(Table 1) contd....

Donation App	Category	Foundation Year	Features	Limitations
Donatekart	Donate Supplies	2020	They collaborate with NGOs and allow users to donate clothes as part of their charitable campaigns.	The availability of clothes donation campaigns may vary, and it may not be a dedicated platform for clothes donation.

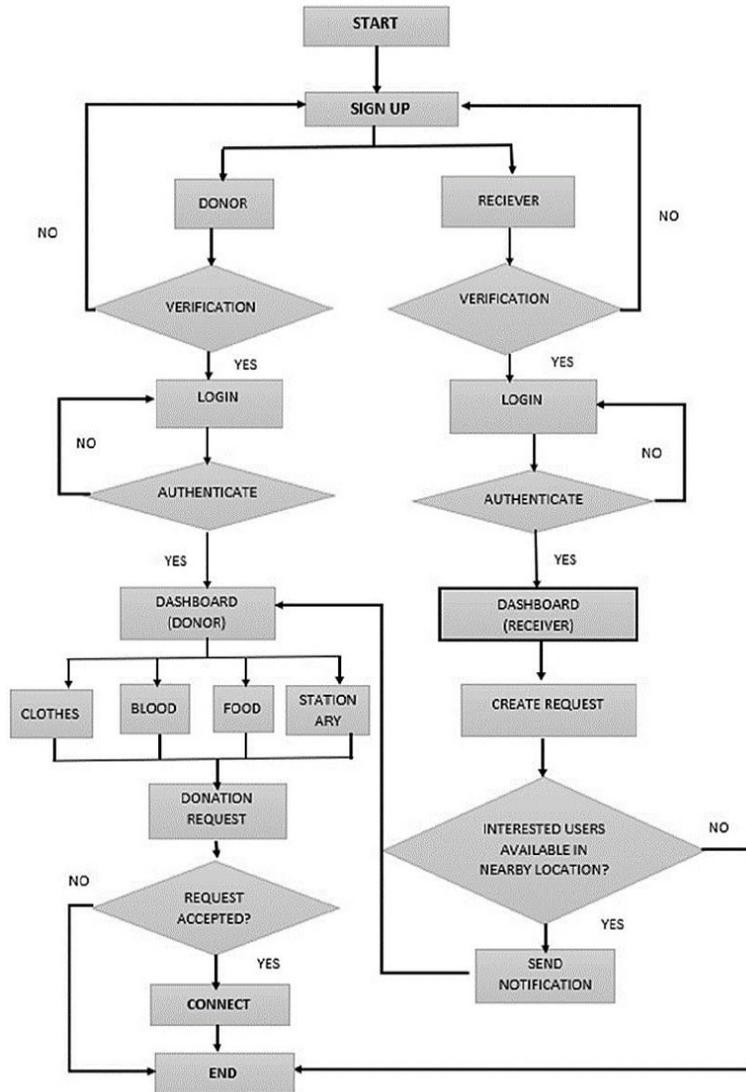


Fig. (1). Workflow diagram.

4.7. Rate and Review

After the donation is made, users and beneficiaries will be able to rate and review each other based on their experience, to help build trust and accountability within the system.

4.8. Donation History

Users will have access to their donation history, including details of all donations made through the app.

5. APP DEVELOPMENT: DESIGN AND IMPLEMENTATION

5.1. Design of the DONAPP

We elucidate the framework of our DONAPP, which integrates various HCI principles [12]. Effective interaction design necessitates addressing the specific needs and considerations of the targeted users [13]. Consequently, our app design encompasses the following stages:

5.1.1. Stakeholder Identification

Within the realm of HCI, stakeholders are defined as “individuals or entities impacted by the system and possessing a direct or indirect sway over its requirements” [12]. In the context of our DONAPP, we classify stakeholders into four donation categories: food, blood, clothing, and stationary. Certainly, there are several differences between these categories, both in terms of the nature of the donations themselves and the processes involved in donating and receiving them. Here are some key distinctions:

5.1.1.1. Nature of Donations

5.1.1.1.1. Food

Food donations typically consist of perishable or non-perishable items intended for consumption. These can include canned goods, fresh produce, packaged foods, *etc.*

5.1.1.1.2. Blood

Blood donations involve giving a portion of one's blood for medical purposes, such as transfusions for patients undergoing surgery, suffering from medical conditions, or in emergencies.

5.1.1.1.3. Cloth

Cloth donations encompass clothing items such as clothing, blankets, shoes, and other textiles. These items are often used to provide warmth, protection, and comfort to those in need.

5.1.1.1.4. Stationary

Stationary donations include items like pens, pencils, notebooks, textbooks, and other educational materials. These donations are typically used for educational purposes and to support learning activities.

5.1.1.2. Donation Processes

5.1.1.2.1. Food

Food donations may require adherence to certain health and safety regulations, especially for perishable items. Donors may need to coordinate with food banks, shelters, or organizations equipped to handle food storage and distribution.

5.1.1.2.2. Blood

Blood donations involve a more structured process, often requiring donors to visit blood donation centers or mobile blood drives. Donors undergo health screenings and must meet specific eligibility criteria before donating blood.

5.1.1.2.3. Cloth

Cloth donations may involve sorting and organizing clothing items before donating them to shelters, thrift stores, or other organizations. Some charities may have specific guidelines for the types and conditions of clothing they accept.

5.1.1.2.4. Stationary

Stationary donations are often collected and distributed through educational institutions, community centers, or charitable organizations. Donors may need to coordinate with these entities to ensure that donated stationary items reach those in need, such as students or educators.

5.1.1.3. Recipients

5.1.1.3.1. Food

Food donations are typically directed towards individuals or families facing food insecurity, homeless shelters, soup kitchens, or food banks.

5.1.1.3.2. Blood

Blood donations are primarily used in medical settings, including hospitals, clinics, and emergency response situations, to treat patients with various medical conditions or injuries.

5.1.1.3.3. Cloth

Cloth donations are often provided to individuals experiencing homelessness, refugees, disaster victims, or those in need of clothing assistance due to financial hardship.

5.1.1.3.4. Stationary

Stationary donations are usually targeted towards students, schools, educational programs, or community initiatives aimed at supporting learning and academic development.

Overall, while all types of donations serve important humanitarian purposes, the specific nature of the donations and the processes involved in donating and receiving them can vary significantly based on factors such as health and safety considerations, logistical requirements, and the needs of the recipients.

By taking these distinctions into account, we've pinpointed stakeholders who encompass a diverse range of ages and ethnicities. Most of them reside in the nearby vicinity, making it convenient for us to engage with them in person.

5.1.2. Facilitating Social Interaction in Interface Design

Throughout the interface design phase, we engage stakeholders in interviews to gather their insights, suggestions, and preferences regarding the app's usability. For instance, we explore entry fields from both donor and recipient perspectives. These insights inform the layout of the app. During on-site visits to stakeholders, we gather ethnographic data to ensure their perspectives are incorporated into our app designs.

5.1.3. Crafting Conceptual Designs

This stage involves creating wireframes and initial mockup designs that serve as foundational blueprints [13]. Our approach to designing the DONAPP involves blending

our creative concepts with stakeholder suggestions and insights gleaned from ethnographic studies. These wireframes offer a simple framework including entry fields.

5.1.4. Engaging Stakeholders in Design Evaluation

In this Human-Computer Interaction (HCI) process, we seek feedback from stakeholders on the wireframes developed during the conceptual design phase. Typically, app designs undergo refinement based on stakeholder assessments [13]. For the DONAPP, we utilize straightforward questionnaires and direct discussions to gather stakeholder feedback. The final app design evolves based on this feedback loop, refining the mockup designs accordingly.

5.1.5. Iterative Development of Final App Design

HCI principles often advocate for iterative design processes [12]. While larger systems may necessitate multiple iterations, our DONAPP, currently in its prototype phase and targeting a specific region, undergoes one iteration. This streamlined process is facilitated by the

cooperative nature of our stakeholders, who provide satisfactory evaluations early on. The resulting final design serves as the blueprint for implementing DONAPP.

5.2. App Implementation on the Android Platform

The implementation of the DONAPP utilizes the Android Platform [14] for several reasons: Firstly, Android Studio offers a range of innovative and user-friendly features that facilitate development. Secondly, we intend to distribute the app *via* the Android marketplace through Google, which offers a straightforward process for individual developers. The front-end design and functionalities of the app are coded using Android, while the backend is developed using Java. Data entered by users and the insights derived from it are stored in Firebase, serving as the app's knowledge base (KB).

The app is divided into two modules: Donor and Receiver. Both the donor and receivers' registers on the application provide the necessary information (Fig. 2). The donor section is again divided into four sections based on the item to donate *i.e.*, food, clothes, stationery and blood.



Fig. (2). Signup.

The image shows a mobile application interface for creating a new user profile. The title is "New User?" with the subtitle "Create Your Profile...". The form consists of the following fields:

- Name
- E-Mail
- Phone Number
- Create Password
- Confirm Password
- Address section:
 - City
 - Street Address
 - Pin Code
 - State
 - Country

At the bottom of the form, there is a blue "SIGN UP" button and a link that says "Already have an account? Login".

Fig. (3). Donor signup.

After signup there is a form for proper data to be recorded from the donor/receiver to match the requirements (Fig. 3). The navbar of dashboards of the donor and receiver contains features of chat, notification, history, and profile of the user.

The donor's side: The donor is provided with 4 categories to choose from namely food, clothes, blood and stationery (Fig. 4). When the option of food is chosen, the user is again given two options to choose from. One is for human edibles and the other one is for animal/pet edibles. Depending on the option chosen by the user some questions regarding the type of food, its expiration date, quantity, pictures, *etc.* are being asked to get relevant information about the food to be donated. The user is asked to choose the type of organization to which he wants to donate *i.e.*, NGO, Orphanage, shelter home, or old age home (Fig. 5).

After selection, the list of organizations based on factors such as distance, availability, past donation acceptance record, and the quality needed are suggested to the user, the user chooses one of the organizations to donate to and makes a donation request by clicking on the donate button. If there is no organization of the selected category in his locality then a 'not available' message is displayed, the user then can select a different category to donate. Once the request has been created the nearby organizations present in the list are also made aware of the request apart from the organization selected by the user. Once the donation request is accepted by the organization, the donation request gets closed for other organizations. If the organization selected by the user refuses to accept the donation, then other organizations present in the list get an option to accept or reject the donation the preference is given based on the distance and quantity required by the organization taking the past

donation history as a constraint. Once the donation request is approved, there is a chat feature in the donor section, where the Ngo's contact (who accepted the donation) gets added to the contact list for communication.

Once the donation has been received by the organization and the organization confirms the transaction, in the donor dashboard the name and date of donation are added in the donation history section (Fig. 6). The donor cannot donate to the same organization more than two times in 15 days. This constraint is added so that the same organization does not receive donations all the time, leading other organizations to starvation. If the user selects the clothes option, then the user is asked to select the type of clothing he is willing to donate, *i.e.* summer clothing or winter clothing. Based on the option chosen the user is asked to give further details of clothing such as the age group of clothes, pictures of clothes, and quantity to donate (Fig. 5).

The organization-choosing process is the same as that in the food section with the difference that if there is no organization in the selected category then the organization within 18 km of the range is displayed to the user in the list. If still in 18 km there is no organization of selected category, then the message not available is displayed, the rest all the process is the same as that in

food donation.

Likewise, the stationery option works in the same fashion as that of clothes. If the user wants to donate blood, then the user's scanned medical records are to be submitted in the application along with some contact details, age, blood group, and residential details. The data and medical records submitted by users are displayed to the hospitals in urgent need of blood. Apart from the urgent requirement by hospitals in case of emergency, users can donate blood to nearby blood banks suggested to them in the app. Whenever an emergency is created by nearby hospitals, the notification of the required blood type and hospital name is displayed to all nearby users. Once a user confirms to donate blood and donates it, the request is closed on both sides and the record is maintained in the user account as well as in the hospital or blood bank dashboard.

The receiver side: Let us see the app from the organization's view. While signup organization details like its location, type, and type of acceptable donation, its contact information is taken (Fig. 7). When any organization says NGO signs up with an app, there will be two courses of action, one will be where he can see the donor's request for a donation and the other will be where he can create a request for the need of donation by providing its requirement and time limit.

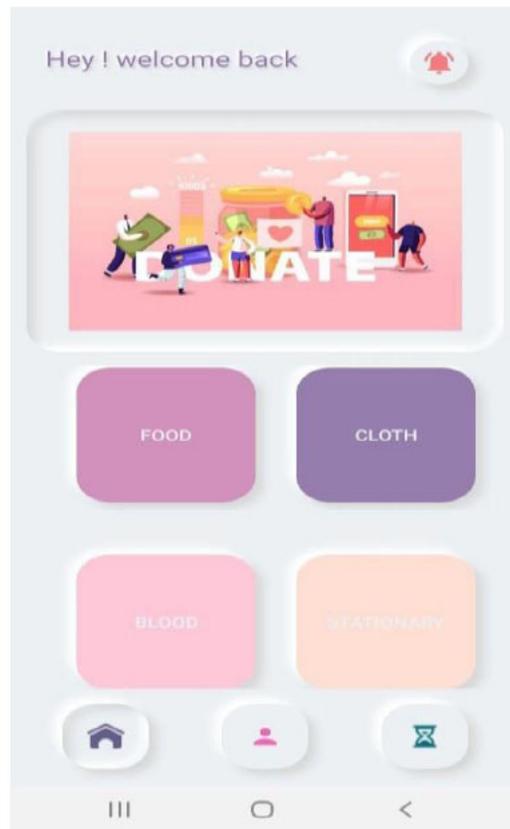


Fig. (4). Donor homepage.



Fig. (5). Donate clothes.

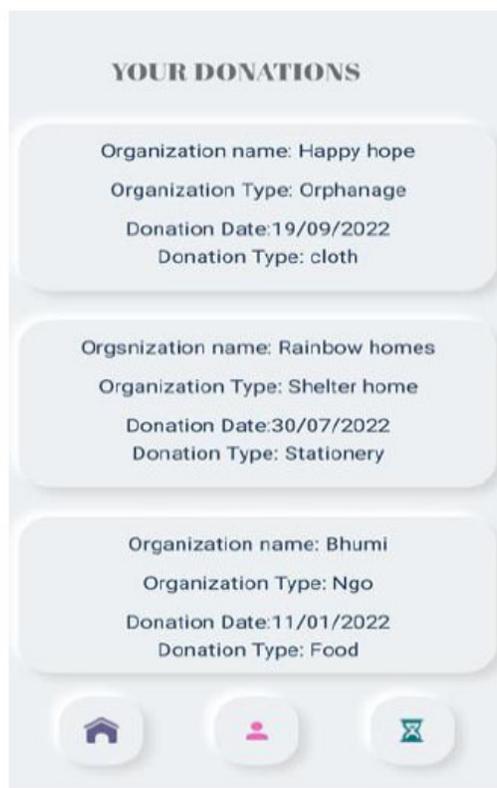


Fig. (6). Donar history.

All the data provided is stored in the database to do the filtering and match the needs generated by an organization with that of users. If the organization receives the notification that a user wants to donate then he has the option to reject or accept it, else if the organization name was displayed in the list to the user while creating a donation request the organization will receive the donation request but will be in waiting where the accepted donation button will be disabled (Fig. 8). If the organization selected by the user denies the request, then the accepted donation button will be enabled according to the preference.

The organization can also create a request for need. For doing so he will be given the same options of categories as donors *i.e.*, blood, food, clothes, and stationery. While creating the food acceptance request the organization is bound to provide the details like food required is for pets or humans, that it will have to give

details like at maximum for how many days he can accept the food, and what type of food is required or is willing to accept.

The request generated will be put to be displayed to all the donors who are near the NGO as well as the name will be suggested in the list where the donors choose the organization for donation if the criteria of the donor and organization match. The Ngo dashboard has a section where the list of all the donors who want to donate with the specification of items is displayed. The NGO can accept donations according to their need. The donor whose donation is accepted receives a message of “donation accepted” from the organization and the rest all the donors get the notification of “not accepted” for the same category (Fig. 9). The receiver/organization cannot accept more than two donations in 15 days. There is a chat feature available for organizations to chat with their respective donors.

Fig. (7). Receiver signup.



Fig. (8). Recipient/receiver page.



Fig. (9). Receiver history.

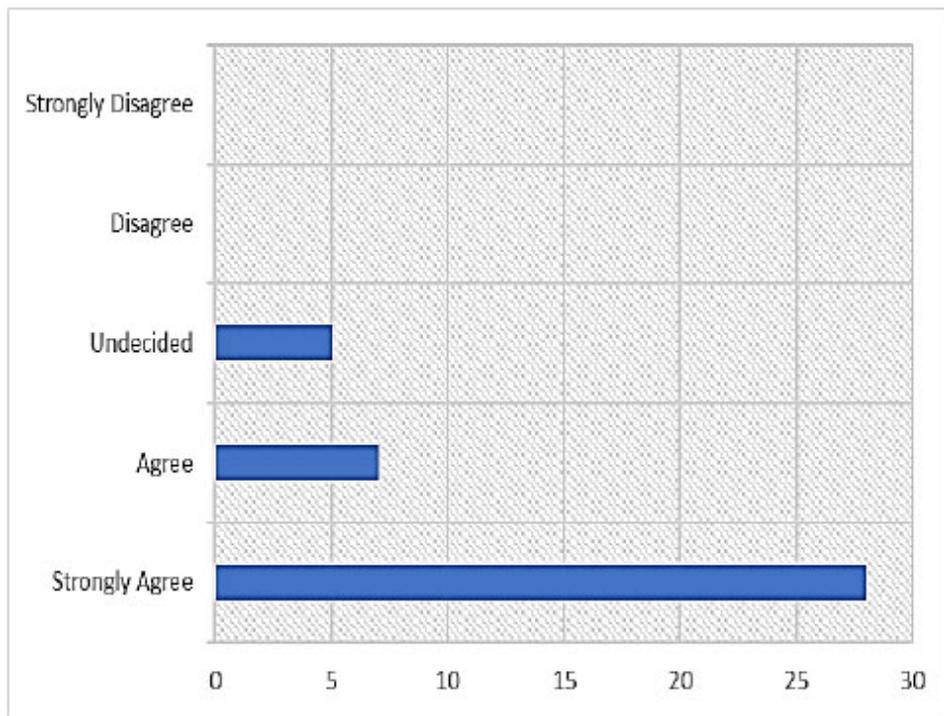
6. RESULTS AND DISCUSSION

To test the effectiveness of DONAPP, we conduct simple, informal user surveys that are provided to various stakeholders. These surveys are designed to assess the app in both an objective and subjective manner. The objective survey questions used in the survey are as follows:

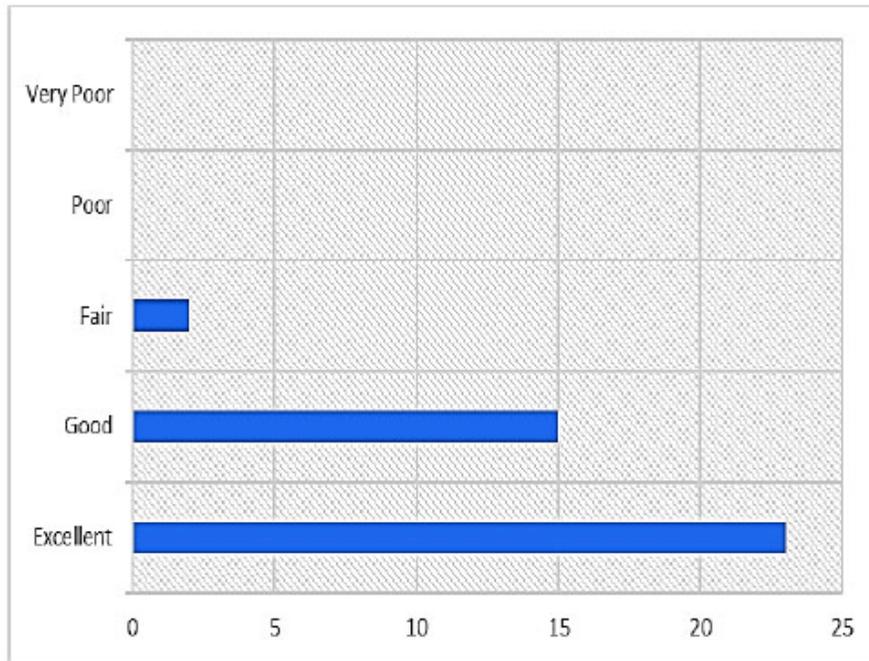
We surveyed to evaluate the DONAPP, with Q3-Q8 utilizing a Likert scale commonly used in HCI. Our survey was distributed to over 50 participants, and we received responses from 40 individuals. The results of the survey

show that people from 5 different states in India have taken the survey, indicating a broad residential interest in the app. Additionally, we found that the app is popular across a range of occupational demographics, as responses included over 10 different occupations. We have summarized the results of Q3-Q8 and Q11-Q12 in Figs. (10-13). Whereas the answers to Q9 and Q10 show that our app is up to the mark. It is noteworthy that respondents were highly motivated to fill out the survey, and all questions received positive responses, indicating satisfaction with DONAPP.

- Q1. Which state do you reside in?
- Q2. What is your profession?
- Q3. How user-friendly is the app?
- Q4. How easy is it to navigate the app?
- Q5. How well do you find the overall layout of the app?
- Q6. How quickly does the app respond to user commands?
- Q7. How stable is the app? Does it crash or freeze often?
- Q8. How helpful are the app's documentation, tutorials, and support resources?
- Q9. I will recommend to others to subscribe to DONAPP for donations.
- Q10. Does the app have all the necessary features? (Yes/No)
- Q11. Does the app save your work automatically? (Yes/No)
- Q12. I intend to donate something to the NGO's/ Needy via DONAPP.

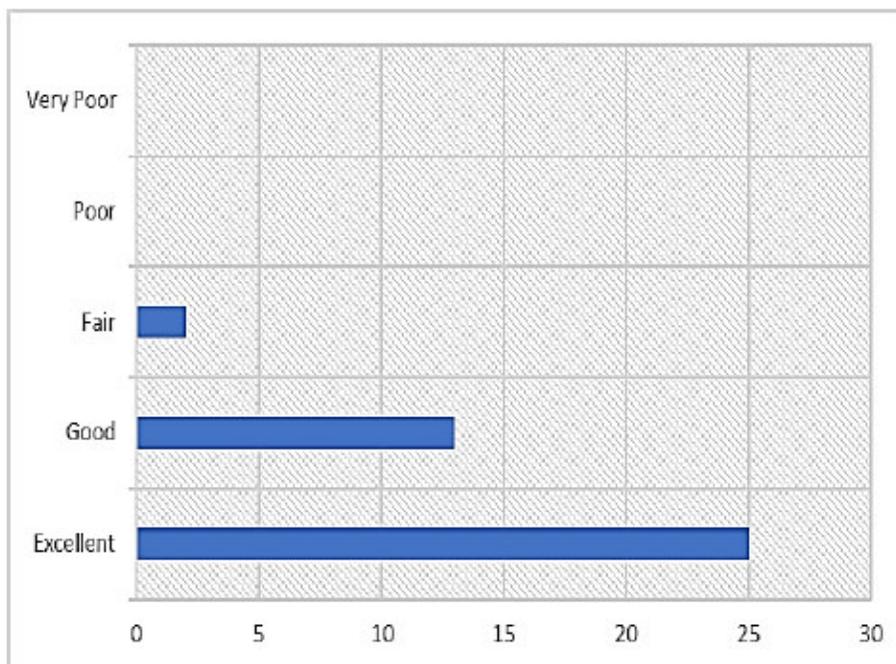


(a)

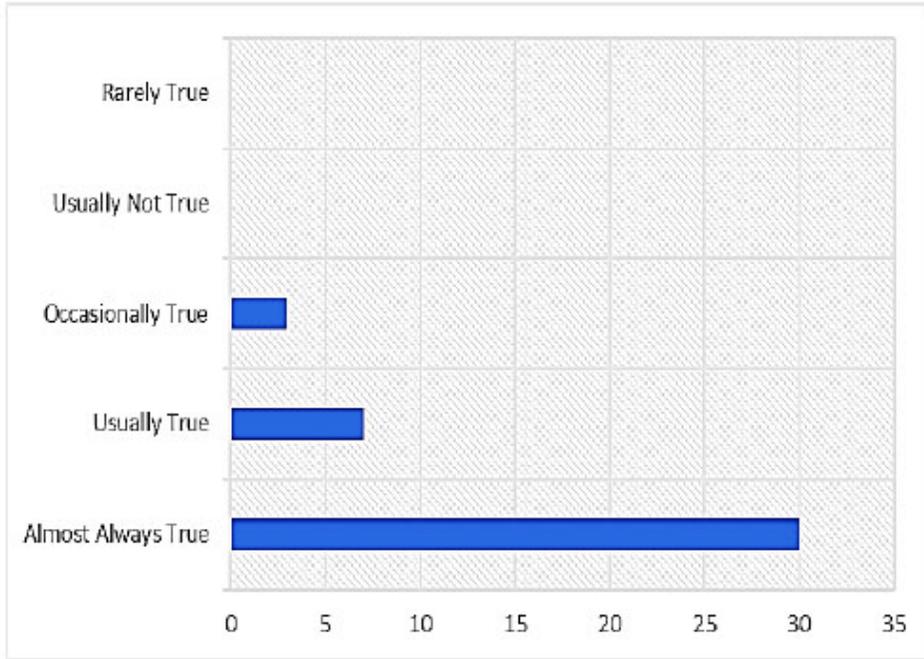


(b)

Fig. (10). (a) Responses to Q3 based on the user friendliness of the DONAPP (b) Responses to Q4 based on the navigation of the DONAPP.

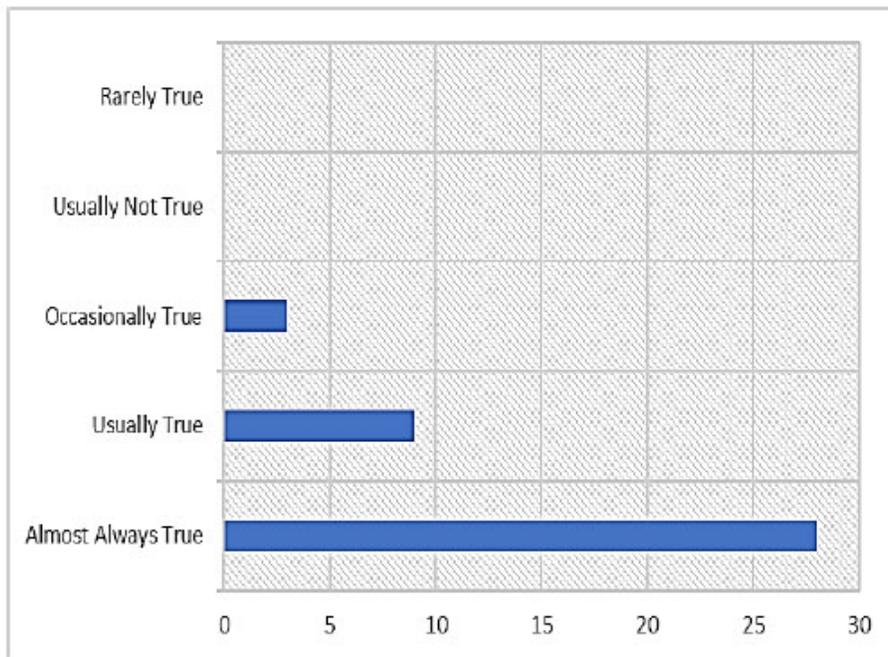


(a)

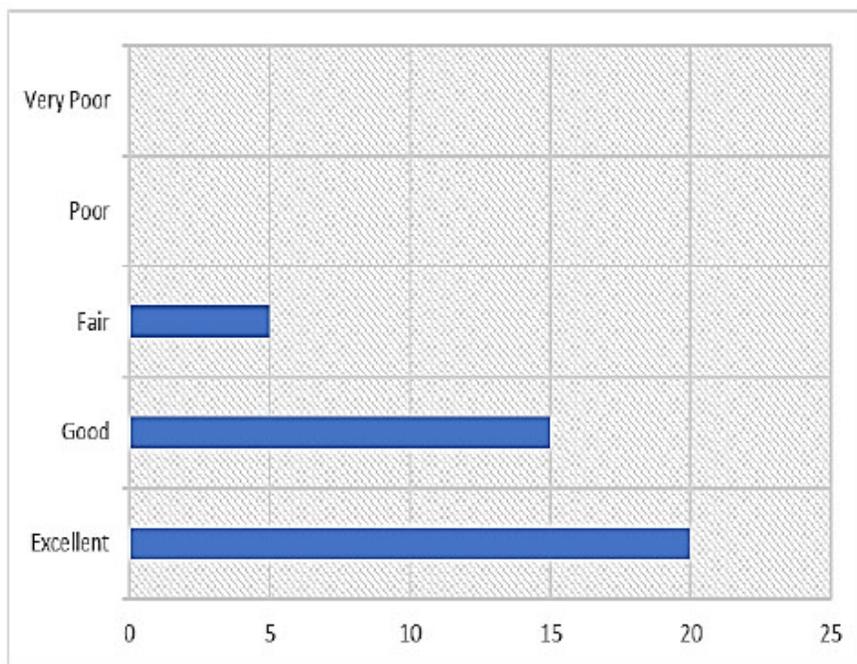


(b)

Fig. (11). (a) Responses to Q5 based on the overall layout of the DONAPP (b) Responses to Q6 based on the responsiveness of the DONAPP.

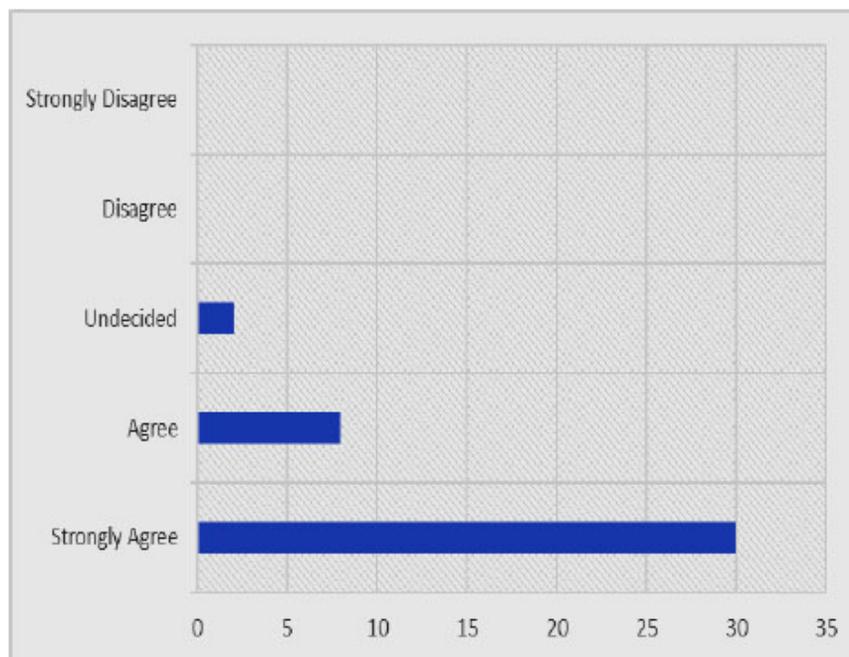


(a)

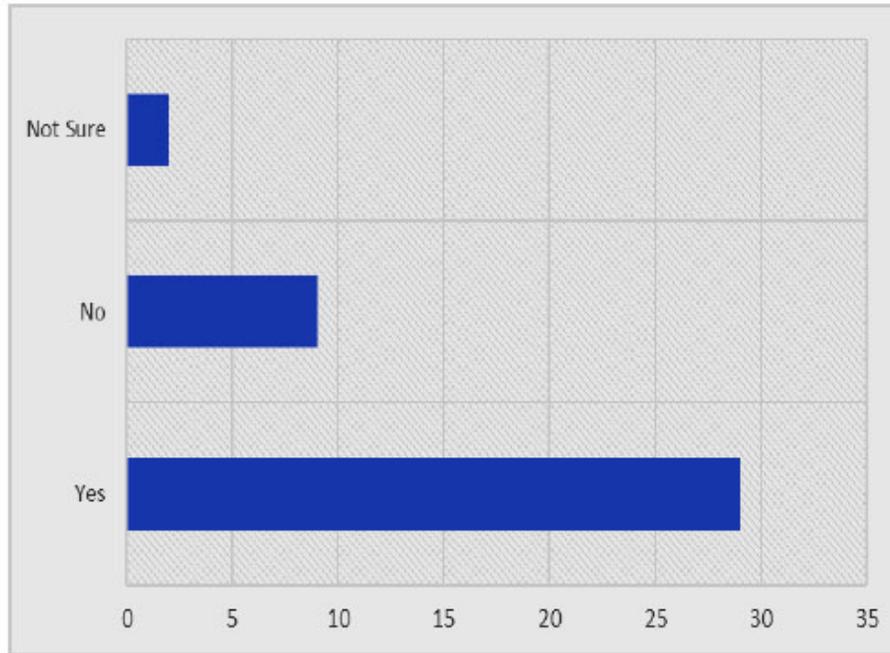


(b)

Fig. (12). (a) Responses to Q7 based on the stability of the DONAPP (b) Responses to Q8 based on the utility of the DONAPP.



(a)



(b)

Fig. (13). (a) Responses to Q11 based on user intention to use the DONAPP (b) Responses to Q12 based on user willingness to recommend DONAPP to others.

We also ask users to give verbal comments in the surveys to enable a subjective evaluation of the DONAPP. However, it is common to receive a range of feedback/comments after conducting a survey. This feedback includes positive comments about the application's features and usability, as well as negative feedback about areas that need improvement. Some comments are neutral or offer suggestions for future development. It is important to analyze and address all feedback received to improve the proposed application and ensure user satisfaction. These comments are summarized herewith.

The evaluation of the prototype DONAPP, both objectively and subjectively, has been very positive overall. The survey results clearly indicate that participants find the app useful, and the verbal comments are encouraging, reflecting a positive initial response and an eagerness for the eventual release of the app. It is also great that some participants have offered ideas for improvement. Based on these suggestions and our research, we have identified several areas where the app could be improved, including transparency, personalization, accessibility, security, and social sharing. These improvements will increase the app's appeal and will be implemented in an updated version of the DONAPP, which we plan to release on the Android marketplace via Google. We will also work on enhancing the app's publicity to reach a wider audience.

CONCLUSION

The proposed idea of creating a centralized platform in the form of an app to connect donors and receivers can be a very effective way to bridge the gap between them. With the increasing use of smartphones and the internet, such an app can provide an easy and convenient way for people to find NGOs, orphanages, and shelter homes around their locality that require donations. Similarly, the app can also help people find nearby blood donation centers and donors in case of urgent blood needs. The app is designed with features such as a searchable directory of NGOs, orphanages, and shelter homes, a map-based interface to locate nearby blood donation centers, and a messaging system to send notifications to potential blood donors in case of an emergency. The app also provides information about the specific donation needs of each organization or hospital, making it easier for donors to identify the most urgent needs and make targeted donations. This study centers on the development, execution, and assessment of an initial prototype application named DONAPP, aimed at facilitating various forms of donations. The key aspects of our investigation are as follows:

- Introducing DONAPP, which aligns with existing donation applications while incorporating additional functionalities.
- Addressing donation-related challenges from the perspectives of both donors and recipients.

- Integrating human-computer interaction (HCI) concepts into the application's design, subsequently implementing it on the Android platform, and conducting 40 user surveys with diverse demographics, yielding highly favorable responses.

Future endeavors involve potential enhancements to DONAPP based on prototype feedback, with the prospect of releasing it on the Android marketplace. We anticipate that our findings will prove valuable to app developers, NGO personnel, HCI and IoT researchers, as well as professionals in related fields. Overall, the proposed centralized platform in the form of an app will be an effective solution to connect donors and receivers and ensure that resources such as food, clothing, and blood are not wasted but reach those who need them the most.

LIST OF ABBREVIATIONS

UNEP = United Nations Environment Program
 HCI = Human-Computer Interaction
 KB = Knowledge Base

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN AND ANIMAL RIGHTS

No animals/humans were used in this research.

CONSENT FOR PUBLICATION

Not applicable.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest financial or otherwise.

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Declared none.

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