

Volunteer and NGO Matching Platform

Sandeep Mishra¹, Akanksha Tiwari², Ved Trivedi³

¹Assistant Professor, Department of Electronics and Telecommunication Engineering, K.J Somaiya Institute of Technology, Mumbai, India.

^{2,3}UG, Department of Electronics and Telecommunication Engineering, K.J Somaiya Institute of Technology, Mumbai, India.

Emails: smishra@somaiya.edu¹, akanksha.tiwari@somaiya.edu², ved.rawal@somaiya.edu³

Abstract

According to a poll conducted in 2021, during the epidemic, the number of donors in India increased by 43%. During the pandemic, Indian non-governmental organizations (NGOs) volunteered their services in every manner conceivable, and they still do. However, over the years, the proportion of volunteers has remained consistent. This demonstrates a disconnect between the general population and nonprofits as well as volunteerism. Establishing a platform that connects these volunteers with other charitable organizations would be crucial. The "Volunteer Matching Platform" project may be able to bridge this gap. This web-based platform is intended to facilitate volunteer connections between non-governmental organizations and local groups. NGOs will use this platform to promote their events to the nation's citizens. On the other hand, volunteers will be able to browse through the available opportunities, filtering based on their interests, location, and availability.

Keywords: NGOs; community organizations; volunteers; charity.

1. Introduction

India is one of the most fleetly growing countries in the world. Culturally rich, with abundant soft power eventuality, the rule of law, and moral rights. Along with a large pool, it has a huge and talented diaspora. A non-governmental organization (NGO) is a voluntary coalition of people or groups that is created to deliver services or promote public policy; it is typically not associated with any government.[1] Undoubtedly, NGOs have played a valuable role in meeting the evolving requirements of the two-day special structure through their exceptional work in certain domains and their importance in various fields.[17] However, there are currently a number of NGOs in India dealing with a range of issues and difficulties that are making it difficult to carry out different developmental projects.[16] Within this framework, this study has attempted to highlight the main issues or difficulties that Indian NGOs confront. In India, community development practices are perceived to heavily rely on Non-Governmental Associations. According to the Central Statistical

Institute of India, there are 33 lakh NGOs (Non-Government Organizations) and CSOs (Community Service Organizations) in the nation. [10] However, not all of the levy positions offered by nonprofit organizations are listed on a single website. To find the perfect bone that fits all of their requirements, a client looking for an event [3] would have to browse the websites of a great deal of various organizations. On websites that list job openings, you can often find a plethora of other opportunities and information, many of which have nothing to do with volunteering at all. Eventbrite and Get Volunteering are two websites that subtly promote this directive. Conversely, Get Volunteering will send users to external websites and will not cancel previous events; for this reason, the event has a lot of broken links.[11] This isn't the case with Eventbrite, which hosts a lot of popular events.[9] Additionally, it was established that levying presents several challenges to both volunteering and joining an organization. Therefore, this platform's goal is to make event volunteering

easier so that more individuals may participate. Furthermore, it aims to consolidate all philanthropic organizations onto a one platform, facilitating the easy dissemination of information to all. The Volunteer Matching Platform will be a web-based platform designed to connect volunteers with NGOs and community organizations. The platform will offer a user-friendly interface where NGOs can create listings for volunteer opportunities, providing details about the projects, events, or initiatives they need assistance with.[5] On the other hand, volunteers will be able to browse through the available opportunities, filtering based on their interests, location, and availability. Once a volunteer [12] finds an opportunity they are interested in, they will be able to sign up for it through the platform. The platform will facilitate communication between the NGO and the volunteer, allowing them to coordinate logistics, share updates, and exchange important information. After the completion of an event or project, both the volunteer and the [13] NGO will have the option to provide feedback and reviews about their experience, ensuring transparency and accountability within the community [8].

2. Objective

1. To determine the needs of volunteers and social service and community groups, conduct surveys of the literature and systems.
2. Using the knowledge gained from the background study, create a prototype design and a layout for the user interface.
3. User personas and user pain points will be identified after low-fidelity prototype designs, and updated wireframes and specifications will come next.[6]
4. Turn on the software development volunteer management system. Implementing the frontend—which shows event information and volunteer and organization profiles—as well as the backend—which handles CRUD operations and their API endpoints—and database—which keeps track of event, volunteer, and organization data—will all be part of this. Software testing methodologies like unit testing will come next.
5. System evaluation: Performing a user study to

see if the platform can facilitate the matching of volunteers with specific skill sets with their intended events (research questions, surveys, cognitive walkthroughs, etc.).[4]

6. Provide the user evaluation results and conclude.

3. Project Management Process

To show the project timetable, a Gantt chart is employed. It offers a rundown of the tasks that need to be accomplished for the project to be effectively completed. A project can be [14] handled by segmenting it into multiple phases using the agile technique. This facilitates the seamless and expeditious execution of projects while considering customer requirements [15]. Figure 1 shows the Project Plan.

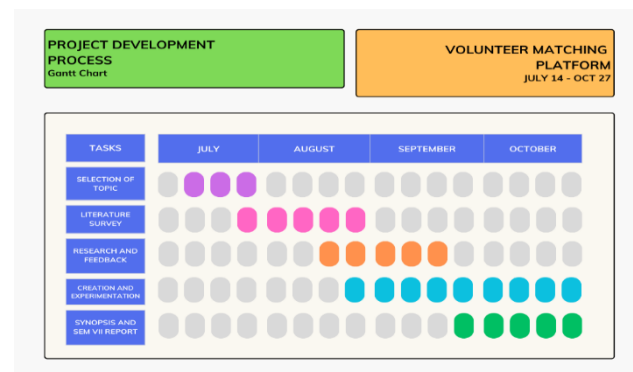


Figure 1 Project Plan

4. System Design Process

Every procedure is made up of carefully considered phases that serve to organize the work and [16] systematize the actions required to accomplish the desired outcome. There are 5 key steps in a system design process namely Empathize, Define, Ideate, Prototype and finally Testing. Figure 2 shows the Design Process.

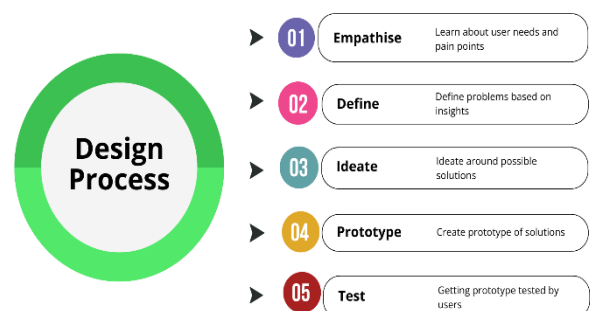


Figure 2 Design Process

4.1. Empathize

In this step, we talk about creating a strategy that we'll use to address the challenges as well as creating the goals and getting to the core of project development. This is where we focus on user pain points, their experiences, motivations, and frustrations that will help us to build the product to their vision. To gain further insight into the project's overall direction, background research was carried out. Numerous problems that organizations and volunteers encounter were shown by this study. The primary issue that volunteers encountered was the informal approach, which creates a sense of personal responsibility that makes it challenging to break a promise. Therefore, the platform that we want to create gives people a place where they can independently determine whether or not they want to participate in any event, which helps to reduce this problem. Therefore, there is no personal responsibility.

4.2. Define

Here, we investigate the several existing solutions that bear comparison to this idea and critically evaluate the merits and drawbacks of each of those solutions. We conducted research on previously developed two potential platforms, they are Figure 3& 4 shows the Website of Get Volunteering and Eventbrite.

1. Get Volunteering: Get Volunteering is a portal

that displays volunteer opportunities in your area and is associated with the Volunteer Centre.[18] One advantage of the platform is the wide variety of roles that are offered at various locations. Also, the positions offer comprehensive information. Only their local volunteer centers are listed as having opportunities available, despite the fact that there are several places to pick from. No volunteer organization's roles are presented to the user.

2. Eventbrite: With Eventbrite, anybody can create, share, find, and attend events that inspire them and improve their lives. Eventbrite is a global self-service ticketing platform for social activities. [19] As previously indicated, anyone may register, create, and host events on Eventbrite, a platform with a broad focus. [7] From conferences to concerts, from professional meetings to art events, they welcome all kinds of activities. They support both paid and unpaid events. They do not solely concentrate on volunteer work, and the only way to find any of them is if they are being used by a charity to plan an event. Which's likelihood of happening is uncertain. For this reason, a volunteer could have to go far and wide before discovering an event, or they might not find one at all.

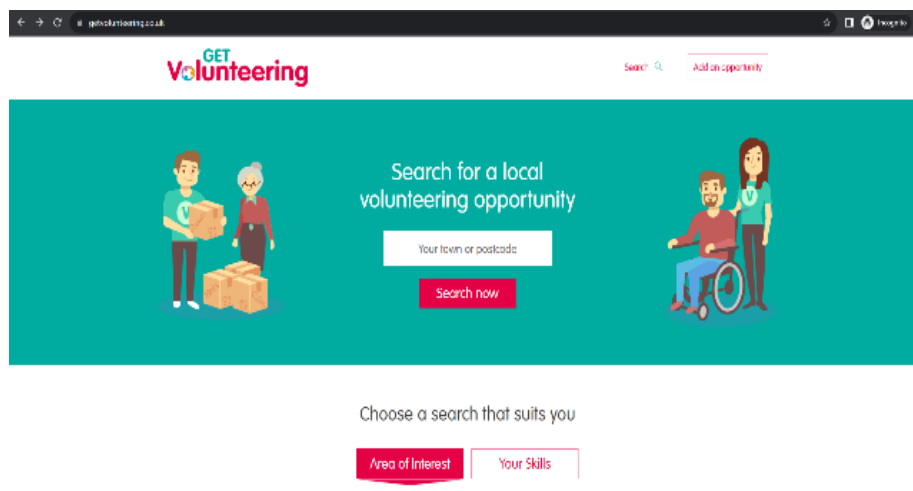


Figure 3 Website of Get Volunteering

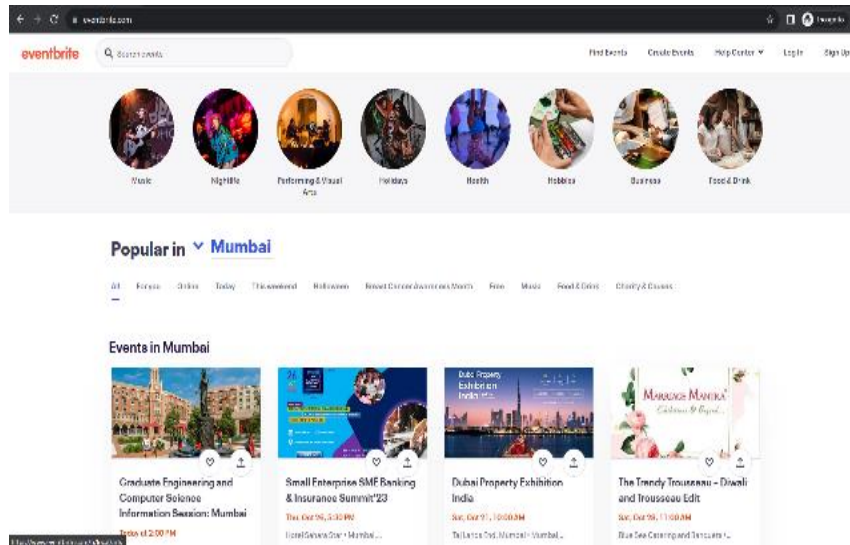


Figure 4 Website of Eventbrite

4.3. Ideate

During the third step of the process, designers are ready to start generating ideas. Since we have established an understanding of who your users are and their needs and also, we have analyzed and synthesized your observations from the research we can conduct in the beginning and create an ideal problem statement to solve for.

4.4. Prototype

The fourth phase of the design thinking process is prototyping. This is the phase in which we create a preliminary solution design. Both the high-fidelity and low-fidelity platform designs are included in the prototype. The structural design of an online service can be made easier with the usage of wireframes, or low-fidelity designs. In order to appropriately arrange content and functionalities on a website while also considering user needs and navigation, wireframes are frequently utilized. Lastly, producing high-fidelity designs.

4.5. Test

Results from the testing phase are frequently used to reframe any issues the user may be experiencing and make sure the prototype's flow makes sense to them. During this stage of the process, the main focus is on closely monitoring the user's thoughts, behaviors, and emotions when they test the product and are asked to think aloud. Refinements and changes are made even

in this phase to rule out solutions to problems and gain the most comprehensive understanding of the product and its users.

5. System Design Process

For this project we used MERN stack development. MERN stack development is a collection of technologies that developers use to build apps using JavaScript. The four technologies that make up the MERN stack are: MongoDB, Express.js, React.js and Node.js. Figure 5 shows the Symbol of MERN Stack.



Figure 5 Symbol of MERN Stack

5.1. React.js

Cross-platform teams can benefit from the adaptable library. React.js a component-based user interfaces

are the primary focus of React. It stays lightweight while effortlessly achieving this goal. Building consistent and minimalist designs is made easier by React's simplicity. Instead of using a tool that the React developers have pre-selected for a particular purpose, developers can now choose the tools they want. In addition, tools can be easily modified when combined with React. [20]

5.2. Node.js

Node.js provides a server-side framework for developing scalable, low-latency network applications. Its asynchronous, non-blocking, event-driven I/O design allows for the creation of real-time websites with push features that scale to support many connections at once. [21] Since Node.js makes back-end programming with JavaScript possible, connecting back-end and front-end functionalities is easy.

5.3. Express.js

Express.js, or Express, is a fast, simple, and lightweight Node.js web framework. Both mobile

applications and the web come with a plethora of features. It provides developers with a large selection of HTTP utility methods and middleware, making the process of creating a secure API quick and easy. [22]

5.4. MongoDB

The open-source database known as MongoDB is developed by MongoDB, Inc. Documents with a JSON-like format, but they can also have different kinds of structures, are used to store data in MongoDB. It's a rather well-known NoSQL database. What is meant by "NoSQL tool" is the absence of rows and columns found in a typical database. MongoDB supports the binary subset of JSON known as BSON, which is a format for storing documents. [23] Other tools used are Figma which helps in creating wireframes and high-fidelity prototypes, Tailwind CSS which is a CSS framework used to speed up the development of the frontend using less code. Figure 6 shows the Flowchart for Volunteers.

6. User Flow

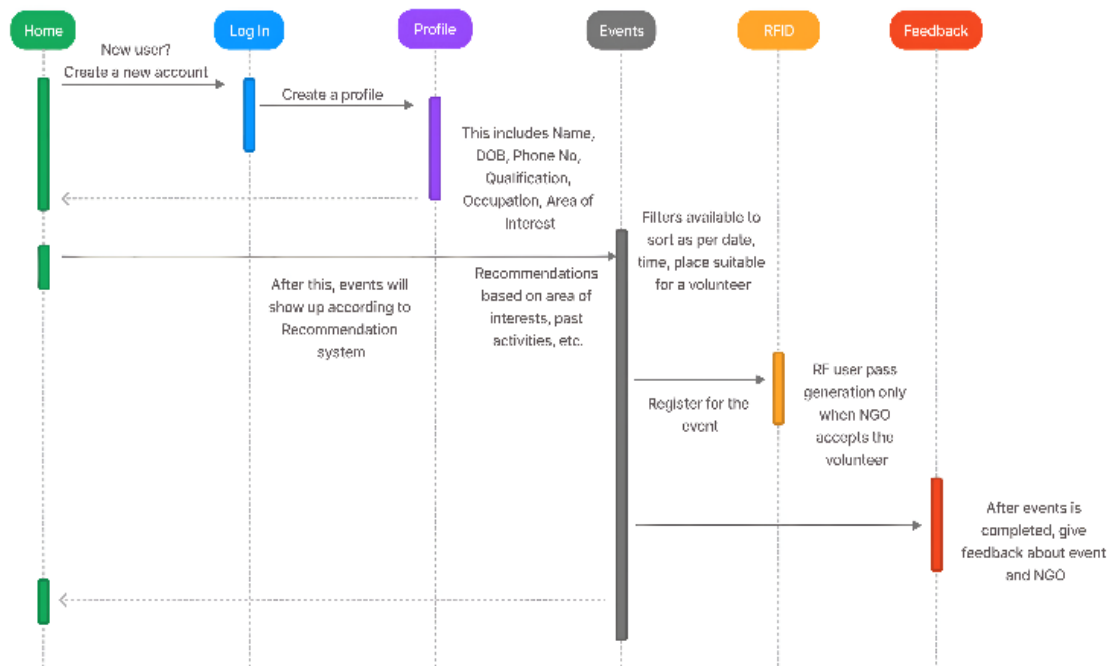


Figure 6 Flowchart for Volunteers

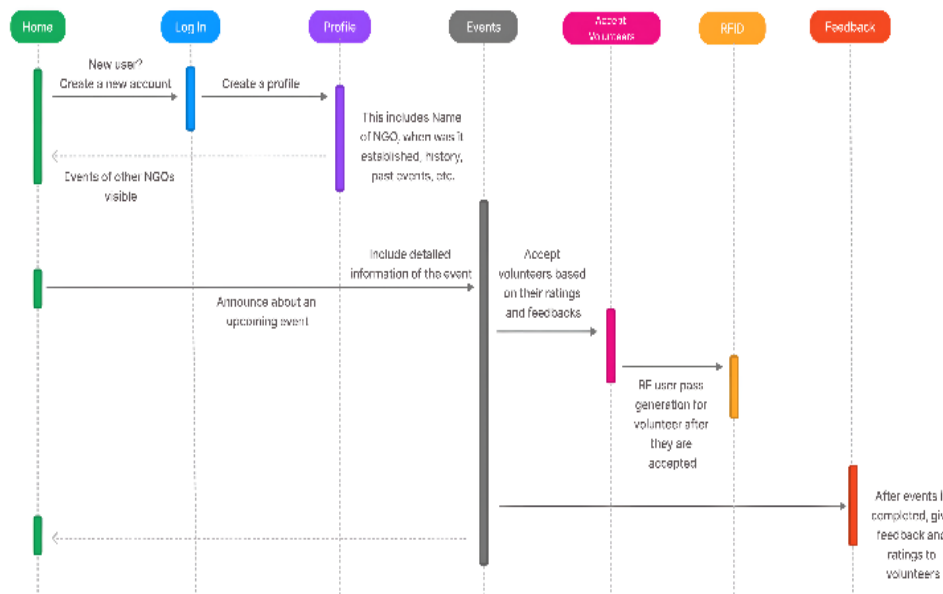


Figure 7 Flowchart for NGOs

The platform will offer a user-friendly interface where NGOs can create listings for volunteer opportunities, providing details about the projects, events, or initiatives they need assistance with.[1] On the other hand, volunteers will be able to browse through the available opportunities, filtering based on their interests, location, and availability. Once a volunteer finds an opportunity they are interested in, they will be able to sign up for it through the platform. The platform will facilitate communication between the NGO and the volunteer, allowing them to coordinate logistics, share updates, and exchange important information. After the completion of an event or project, both the volunteer and the NGO will have the option to provide feedback and reviews about their experience, ensuring transparency and accountability within the community. Other features include a recommendation system to develop a recommendation system that suggests volunteer opportunities to users based on their profiles, past activities, and preferences. Enhance the matching process by connecting volunteers with opportunities requiring their skills or expertise. Verified Organizations (like Instagram and Twitter) to introduce a verification process for organizations to ensure they are legitimate and aligned with genuine service activities. Online discussion forums to

create online discussion forums or interest-based groups where volunteers can connect, share ideas, and collaborate beyond individual opportunities. Gamification Elements introduce gamification elements like badges, rewards, or leaderboards to encourage consistent engagement and participation.[2] Barcode User Pass Generation and donation to NGOs are features that help NGOs and volunteers for a better experience. Barcode User Pass Generation and donation to NGOs are features that help NGOs and volunteers for a better experience. Figure 7 shows the Flowchart for NGOs.

Conclusion

Connecting volunteers with social service opportunities that align with their interests is the aim of this effort. The background investigation reveals a dearth of volunteers despite the large number of philanthropic groups. This is because volunteering presents a number of difficulties, which deters people from offering their services. Therefore, we require a platform that is only for volunteers. A platform where volunteers were employed in accordance with their needs.

References

- [1] M. Goel, A. Agarwal, N. Chandwani and T. Dixit, "Building an application framework to

- connect NGOs and Volunteers," 2021 International Conference on Innovative Practices in Technology and Management (ICIPTM), Noida, India, 2021, pp. 1-5, doi: 10.1109/ICIPTM52218.2021.9388342.J.
- Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.
- [2] F. Tian, Y. Chen, X. Wang, T. Lan, Q. Zheng and K. -M. Chao, "Common Features Based Volunteer and Voluntary Activity Recommendation Algorithm," 2015 IEEE 12th International Conference on e-Business Engineering, Beijing, China, 2015, pp. 43-47, doi: 10.1109/ICEBE.2015.17. keywords: {Algorithm design and analysis;Measurement;Collaboration;Information filters;Correlation;Filtering algorithms; feature matching; rating matrix; Personal Rank algorithm; recommendation system},
- [3] C. -N. Lee and C. -Y. Yang, "An information service platform for hospital volunteer team," 2016 International Conference on Machine Learning and Cybernetics (ICMLC), Jeju, Korea (South), 2016, pp. 676-680, doi: 10.1109/ICMLC.2016.7872969. keywords: {Hospitals;Training;Encryption;History;Cybernetics;Curricula;Volunteer Service; Information Platform},
- [4] V. Varadarajan and A. Ganz, "Volunteer Get - A novel information system for engaging society in volunteering for emergency care," 2008 30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Vancouver, BC, Canada, 2008, pp. 747-750, doi: 10.1109/IEMBS.2008.4649260.
- [5] O. Berezko and P. Zhezhnych, "Rethinking the NGO website from the knowledge management perspective," 2017 12th International Scientific and Technical Conference on Computer Sciences and Information Technologies (CSIT), Lviv, Ukraine, 2017, pp. 389-392, doi: 10.1109/STC-CSIT.2017.8098812.
- keywords: {Organizations; Knowledge management;Tools;Social network services; Knowledge engineering; Unified modelling language; knowledge management;website;social knowledge environment; Web 2.0;user generated content; user curated content; civil society;NGO},
- [6] J. K. Vagairya, M. Poonia, P. Ranjan and S. Kumar, "NGO Portal - A Platform to connect NGOs with prospective members," 2022 IEEE Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation (IATMSI), Gwalior, India, 2022, pp. 1-4, doi: 10.1109/IATMSI56455.2022.10119384. keywords: {Technological innovation;Databases;User experience;Registers;History;Portals;Videos },
- [7] H. -Y. Chen, Y. -C. Chen, H. -L. Li and H. -C. Wu, "Developing volunteer management system with Java EE Technology: The case of Taichung volunteer service promotion centre," 2017 IEEE 8th International Conference on Awareness Science and Technology (iCAST), Taichung, Taiwan, 2017, pp. 138-142, doi: 10.1109/ICAwST.2017.8256433. keywords: {Business;Java;Training;Maintenance engineering; Information systems; User interfaces; Urban areas; volunteer service; application system; Java EE Technology},
- [8] R. Sharma, P. Dave and J. Chaudhary, "OCR for Data Retrieval: An analysis and Machine Learning Application model for NGO social volunteering," 2021 Fifth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC), Palladam, India, 2021, pp. 422-427, doi: 10.1109/I-SMAC52330.2021.9640890. keywords: {Pandemics; Data visualization;Organizations;Manuals;Optical imaging; Information retrieval; Optical character recognition software; optical

character recognition(OCR);image processing;information retrieval;Tesseract;NGO;machine learning; deep learning },

- [9] A. A. Pai, R. Kumar P, S. Thomas and P. D, "NGO CONNECT: Technology for Non-Profit Organisation Management," 2023 7th International Conference on Computation System and Information Technology for Sustainable Solutions (CSITSS), Bangalore, India, 2023, pp. 1-6, doi: 10.1109/CSITSS60515.2023.10334076. keywords: {Media;Chatbots;Registers;Reliability;Information technology; Artificial intelligence;Business;nonprofit organisations; technology solutions; database management systems; fundraising software; social media platforms; ethical considerations; legal considerations; best practices },
- [10] R. Shankar and Narita, "Online Monitoring System (OMS) - An Online Tool for Centralized Monitoring of NGOs," 2012 IEEE Global Humanitarian Technology Conference, Seattle, WA, USA, 2012, pp. 208-213, doi: 10.1109/GHTC.2012.72. keywords: {Organizations; Cities and towns;Monitoring;Educational institutions;Blood;Communities;online tool; NGO; monitoring; progress tracking. },
- [11] U. Korkmaz, H. İ. Altunlu, A. Özkan and E. Karaarslan, "Sustainable Member Motivation System Proposal for NGOs: NGO-TR," 2019 1st International Informatics and Software Engineering Conference (UBMYK), Ankara, Turkey, 2019, pp. 1-5, doi: 10.1109/UBMYK48245.2019.8965505. keywords: {Non-governmental organizations; social projects;gamification;blockchain;decentralized digital identity },
- [12] C. M. M. Bezerra, D. R. B. Araújo and V. Macario, "Allocation of Volunteers in Non-governmental Organizations Aided by Non-supervised Learning," 2016 5th Brazilian Conference on Intelligent Systems (BRACIS), Recife, Brazil, 2016, pp. 223-228, doi: 10.1109/BRACIS.2016.049. keywords: {Clustering algorithms;Proposals;Resource management;Organizations;Partitioning algorithms; Recommender systems; Algorithm design and analysis; Recommender Systems; Clustering Algorithms; Volunteer Work;NGO Effectiveness;NGO Management },
- [13] L. Butgereit, "Seven characteristics of a successful virtual volunteering platform," 2011 IST-Africa Conference Proceedings, Gaborone, Botswana, 2011, pp. 1-8. keywords: {Internet;Mathematics;Educational institutions; Cellular phones;Computers;Electronic mail; Virtual groups; Virtual Volunteering;Dr Math;C3TO },
- [14] G. Yu and Z. Li, "Analysis of Current situation and Countermeasures of Performance Evaluation of Volunteers in Large-scale Games Based on Mobile Internet," 2022 8th Annual International Conference on Network and Information Systems for Computers (ICNISC), Hangzhou, China, 2022, pp. 88-91, doi: 10.1109/ICNISC57059.2022.00028. keywords: {Performance evaluation;Computers;Privacy;Games;Instant messaging;Internet;Security;mobile internet;volunteer;performance evaluation },
- [15] J. Schönböck et al., "A Survey on Volunteer Management Systems," 2016 49th Hawaii International Conference on System Sciences (HICSS), Koloa, HI, USA, 2016, pp. 767-776, doi: 10.1109/HICSS.2016.100. keywords: {Unified modelling language; Resource management;Organizations;Nonhomogeneous media; Electronic mail; Medical services; Computational modeling;survey;volunteer management system; reference model },

- [16] Dr Krishna Athal, India, TOI (2022, February 12) How far NGOs have been affected by Covid-19 globally Available at: <https://timesofindia.indiatimes.com/blogs/krishna-athal/how-far-ngos-have-been-affected-by-covid-19-globally/>
- [17] Pradeep Waychal, TOI (2023, March 12) Leveraging NGOs Available at: <https://timesofindia.indiatimes.com/readersblog/maximizing-contributions-of-ngos-for-larger-goods/leveraging-ngos-51372/>
- [18] Get volunteering. Available at: <https://getvolunteering.co.uk/>
- [19] Eventbrite. Available at: <https://www.eventbrite.com/>
- [20] React. Component Available at: <https://reactjs.org/docs/react-component.html/>
- [21] About Node.js. Available at: <https://nodejs.org/en/about/>
- [22] What is MongoDB? Available at: <https://www.mongodb.com/what-is-mongodb>
- [23] Express - Node.js web application framework Expressjs.com. Available at: <http://expressjs.com/>