

For the Good: A Beta Build of a Web-based Solution to Request-based Charity

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Abstract—Donating or giving to charity is often a complex undertaking with several decisions to be made by potential donors, including who or which charity to donate to, how to securely send the money, evaluation of the risk of scam and fraud, the genuineness of appeal, the risk of compromise of privacy etc. At the same time, the opportunity for the needy to put forward requests of a specific desired nature is usually limited to the face-to-face or personal level.

To realize an instant and impersonal request-based donation process, a web application named “ForTheGood” has been conceptualized, designed and developed by the authors of this paper. The application enables the needy to make requests on the website for actual goods available from linked third-party vendors. These requests are made visible in a familiar social-media-style “news feed” format to the general public, who may then donate to any request(s) of their choice by making the required payment to the corresponding vendor through the site.

The application is a fully working beta build replete with well-designed user interface, database support, authentication mechanisms, end-to-end transaction processing capability, payment gateway bridging, usage of automated messaging for internal coordination, envisioning and incorporation of a delivery scheduling algorithm, user-assistive features, activity records in the form of user history, and implementation of certain machine learning and data mining models to enhance user experience.

Index Terms— online donations, charity, web application, request-based donation, social responsibility.

I. INTRODUCTION

India donates 0.37% of GDP (USA donates: 1.44%) yearly to charity [1]. Out of this, 90% of donations in India fall under “informal giving” i.e., personal contributions to community members (for example, domestic helps and the homeless) and religious institutions [2]. This shows that there is already a socially prevalent model of community-based giving at an individual level. The bulk of this giving happens through the offline mode or face-to-face interaction, with online donations accounting for less than 20% of the total donations [2].

Formal, large-scale charities like the Akshaya Patra foundation [3], the Chief Minister’s Relief Fund (CMRD) [4] support online contributions but are geared towards their specific intention only (here - meals for schoolchildren of associated schools, and government-driven disaster relief programs, respectively.) Actual distribution of funds or expenditure of the received funds towards the stated purpose is left to the administration of the same. These do not and cannot cater to the grassroots level of the locals/community and their individual

varied needs. While existing fundraising websites such as GoFundMe.com [5] embody the request-based donation process (enabling beneficiaries to make requests as per their wishes which are then made visible to a public audience), these deal only in monetary donations. There is ambiguity and scant information available to potential donors as to how that money is finally used - the donor is not kept in the loop end-to-end.

Internet penetration rate in India was found to be at approximately 50% of the total population in 2020 [6], growing in huge bounds from 4% in 2007. There is also large variation in the profile of Indian internet users, ranging across socio-economic class and metropolitan, urban, rural demographics: 41% of Internet users belong to NCCS (New Consumer Classification System) CDE classes [7] which suggests that a significant chunk of the lower socio-economic classes could potentially make use of online request-based donation apps as beneficiaries. These numbers are only expected to grow in the coming years, creating a sizable market for the undertaking.

Since the usage of the proposed application either as a recipient or as a donor requires just access to the internet with no special skills, equipment, or social connections, it would make intra-community helping hands a greatly more common reality without the traditional need for the donor and beneficiary to know each other personally.

A. Objectives

The application presented in this paper seeks to bring about a technological revolution in community-based donations by enabling a shift to the online paradigm, which makes it wider-reached, quick and easy. ForTheGood connects three parties - donors, recipients and vendors.

As outlined in fig. 1, the ‘request-based donation process’ eliminates the middleman associated with formal giving, and thus makes person-to-person giving, impersonal. This is by means of a portal which accepts requests from the needy for goods available from a wide database of vendors. These are then visible to the public audience of potential donors, whose payment towards any request of their choice reaches the corresponding vendors in an instant and secure manner with validation in the form of a receipt. This is followed by quick and efficient delivery of the said goods from the corresponding vendor to the corresponding beneficiary.

ForTheGood is driven by a sense of social responsibility, with its primary objective being the substantial fulfilment of requests. Features oriented towards this goal shall be included. ForTheGood intends to respect the donor’s money by helping it go towards genuine beneficiaries. This would be by allowing only recipients matching certain target profiles (termed “recipient categories” in this paper) to sign up after a verification call with us, as opening the website to the public to freely sign up as recipients is potential for misuse. It is intended to protect the privacy of the donor by not revealing their identity or contact information to recipients unless they explicitly choose to do so. Accessibility and usability of the website is also a key goal given the nature of our operation, especially for the pages usable by recipients.

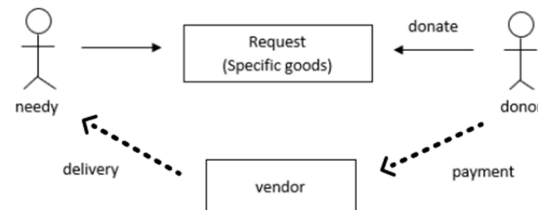


Figure 1. Request Based Donation Process

It is also desirable to have a dashboard of charts that gives a picture of the footfalls and hum generated on the website, which is valuable information to potential users, advertisers, investors etc.

II. PROPOSED MODEL

From here onwards, the term “recipient” shall be used to describe a user of the application whose intent is to request for a particular item/s to be donated, and the term “donor” shall be used to describe a user whose intent is to pay for one of the aforementioned requests.

Fig. 2 shows the workflow of the application, while fig. 3 is a sequence diagram of the process.

Recipients log in to the site to reach a ‘Requirements Entry’ page where they may select items, view request and donation history, avail assistive features, etc. The items selected by them get posted (these are termed “request-posts” for the sake of this paper) on the ‘Feed’ page, which displays all the currently unfulfilled requests made on site sorted by category of recipient.

Donors log in to reach the ‘Feed’ page. Upon clicking on the designated “donate” button on any of the request-posts, they are redirected to a payment gateway enabling the transfer of the required amount from their bank account. Once payment is completed successfully, they are provided with a downloadable receipt, both from ForTheGood as well as the third-party vendor from whom the goods were ordered (simply referred to as the “vendor” here onwards).

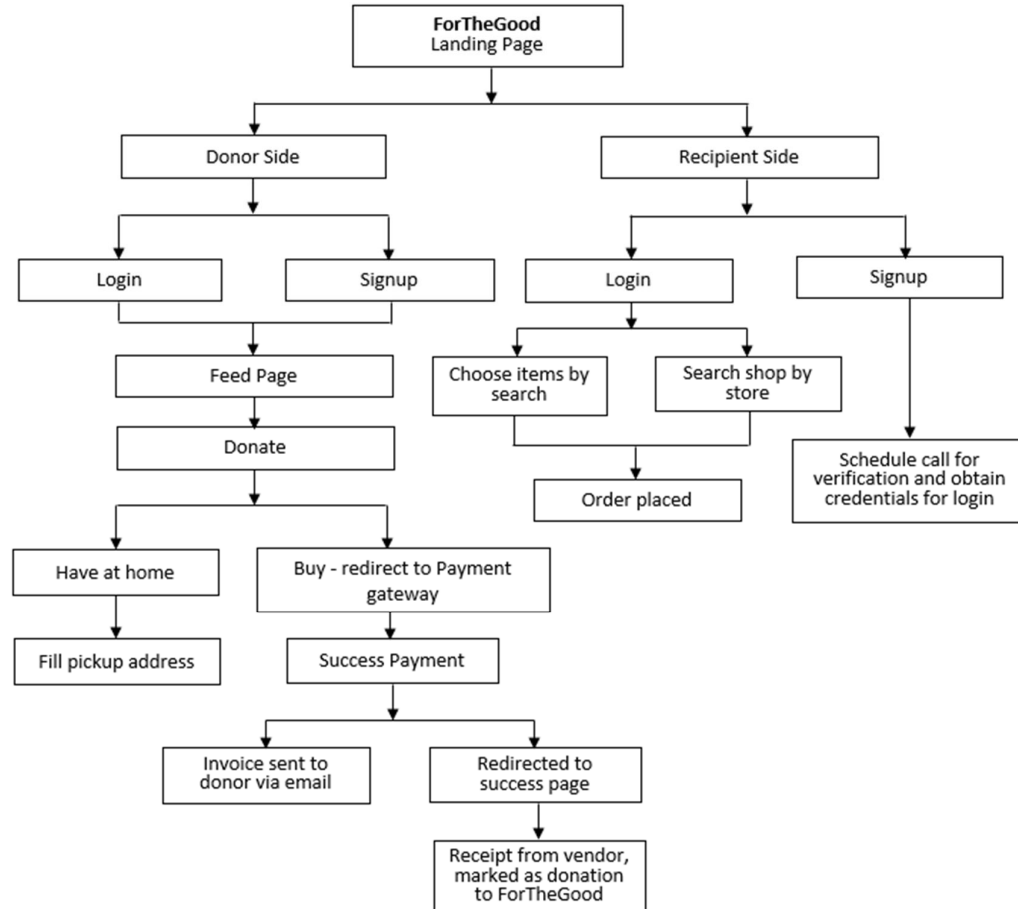


Figure 2. Website Workflow

The vendor is now sent an automated message informing them of the order details and the date by which dispatch by them is expected. On the said date, an assigned ForTheGood delivery agent gets another automated message detailing the ‘from’ and ‘to’ addresses with map routes. Confirmation of delivery of goods to the recipient by the delivery agent completes the process.

III. IMPLEMENTATION

The proposed solution has been implemented as a web-based application using HTML, CSS and JavaScript along with Bootstrap CSS, Bootstrap JS and jQuery AJAX for the frontend; Flask, a Python web framework, for the backend, with data persisted in a MySQL database. Essential APIs used are the *Twilio* API for virtual messaging with WhatsApp, and the payment gateway API from *Instamojo*. Various external libraries / modules such as *CanvasJS*: dynamic charts with JavaScript, *Scikit-learn*: machine learning in Python, the Google Translate API, the Google Maps API, *Geopy*, *PyPdfkit* and *wkhtmltopdf* have been made use of as required.

A. Donor View

The ‘Feed’ page primarily displays request-post cards arranged in scrollable containers segregated by category of recipient, as visible in fig. 4.

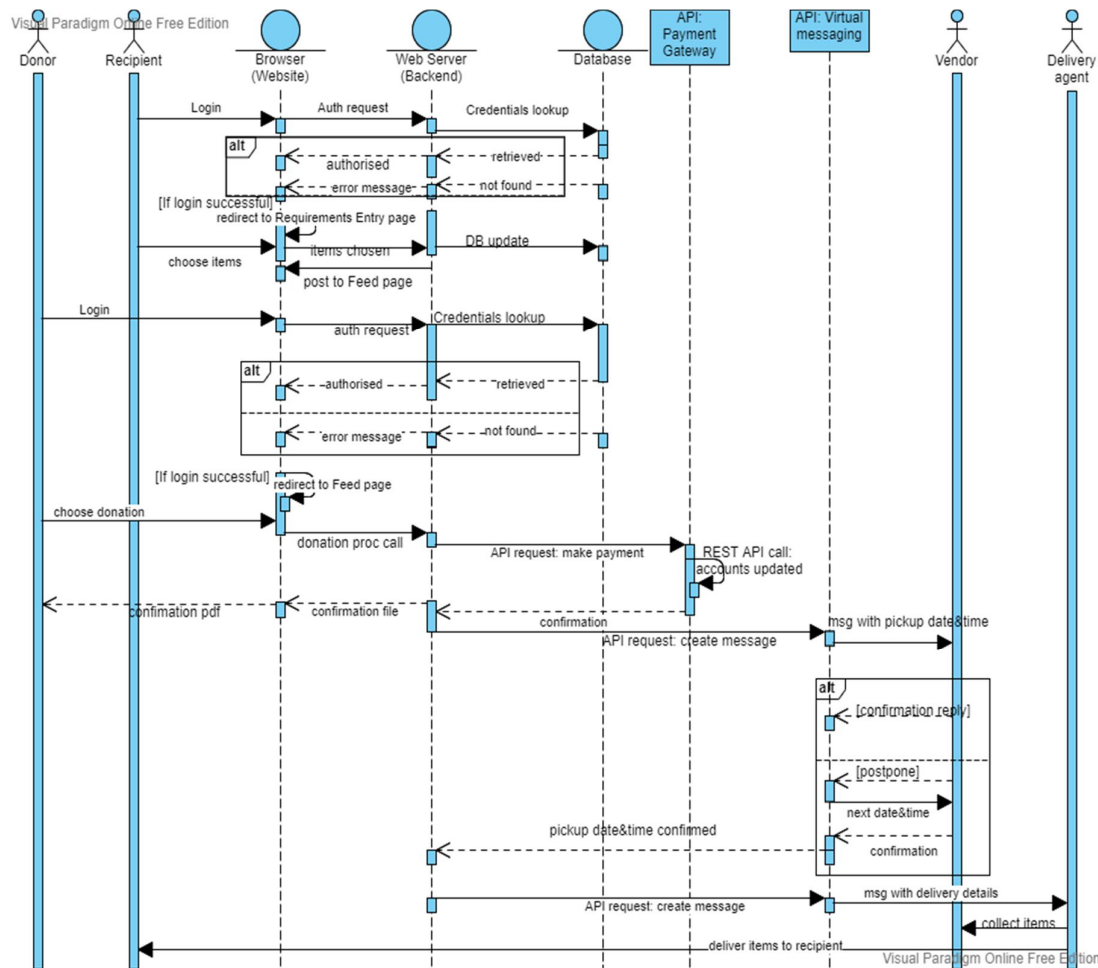


Figure 3. Sequence Diagram

A distinguishing feature is the recipient image gallery, prominently displayed on the landing page under the caption “Lives We’ve Touched”. Displayed here are photos of various recipients receiving their donated goods, to be captured with consent by our delivery agents.

Request-post cards are also grouped under two special categories: Longest Waiting Requests for the top few oldest unfulfilled requests, and Recommended posts. Recommended posts, customized for each donor, are chosen out of the unfulfilled pool by machine learning prediction. A *Naive Bayes classifier* model takes the data of the donor’s previously made donations as input ‘Yes’ rows to the ‘Donates?’ decision, and remaining donations donated by any others (not this donor) as input ‘No’ decisions, to predict the class label of ‘Yes’ or ‘No’ for new requests. Obviously, recommended posts are not available for fairly new or first-time users due to lack of user history.

The donor may choose to have the requested items collected from their own home by providing a pickup address, or make the payment to purchase the same from the vendor. The downloadable receipt can have the PAN number of the donor affixed if desired for tax filing purposes.

A user profile section (fig. 5) is provided in the donor view, with subsections for editing profile details, viewing one’s own donation history, and tracking of the latest donation i.e., seeing at which stage - order confirmed by the vendor, goods dispatched, goods delivered, or receipt confirmed by recipient - the most recently made donation transaction currently is.

There is also a dashboard (fig. 6) of statistical charts and data pertaining to user activity on the website, updated dynamically with each new transaction or request.



Figure 4. Feed Page

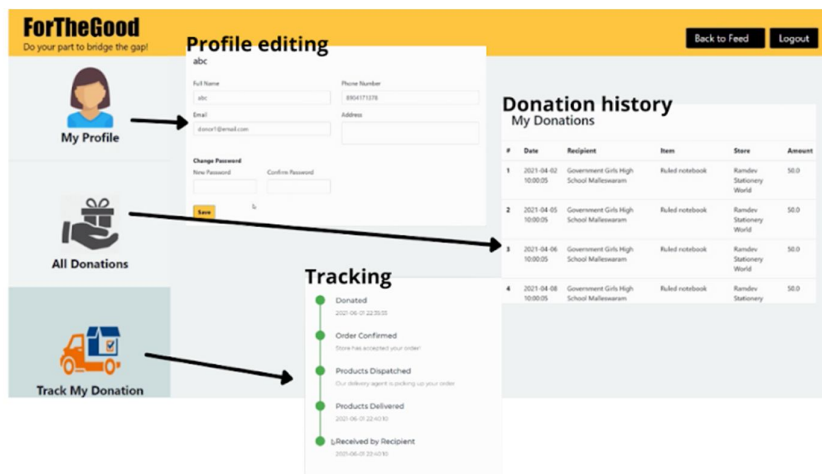


Figure 5. Donor Profile

B. Recipient View

Fig. 7 shows the ‘Requirements Entry’ page with item search bar, item category-based filters, the “shop by store” option which lists the product catalogues of all associated vendors, page translation button, voice assistance button which starts a voice-guided tour of the page, and the notifications tab where alerts appear as and when a requested item is donated or delivered.

Suggestion of further items to request for upon selecting one or more items is done by frequent itemset mining using the *FP-Growth* algorithm. This makes use of the database of activity history of all users on the website to mine the sets of items which are frequently requested together, and suggests the remaining items from such item sets when one or more of them is requested.

Fig 8. shows the History page wherein a modal detailing the breakdown of partial donations is displayed on clicking any of the request rows. Status of the request made is indicated by one of three words: “Pending” - request is yet to be fulfilled by a donor, “InProgress” - requested quantity has been partially donated or delivered (donors are not required to donate the entire requested quantity), or “Completed” - the donation process is complete with entire requested quantity donated. Donor contact number is displayed at the corresponding transaction row only if the donor has explicitly indicated that they wish to allow the recipient to contact them personally for future requests or any other reason as it may be.

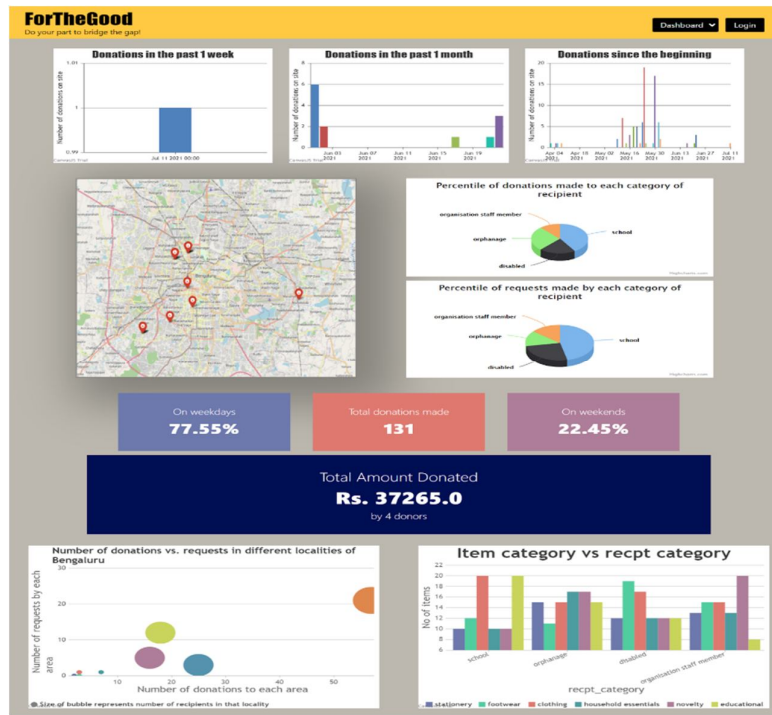


Figure 6. Dashboard

C. Internal Coordination

Automated messages for internal coordination are sent through WhatsApp to the vendor and the ForTheGood delivery agent. WhatsApp has been chosen as the medium for communication as it is simple and already in use by most.

All goods deliveries are accumulated on two days of the week - Tuesdays and Saturdays - to minimize delivery costs incurred by ForTheGood, and in turn, the donors. The vendor is assigned the date of the forthcoming Tuesday or Saturday from when an item which was requested from their shop is *donated*, as the expected dispatch date. In case they opt for postponement of the same, they are assigned the date of the next Saturday or Tuesday respectively.

The vendor may reply to the WhatsApp bot with “1” to accept and confirm the proposed date of dispatch, or with “2” to postpone the same by one delivery date as per the above delivery scheduling algorithm.

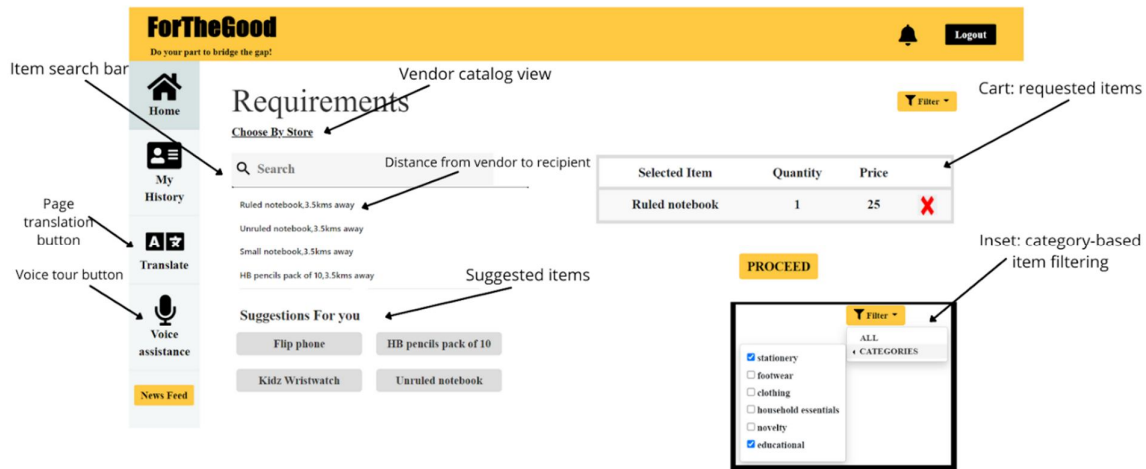


Figure 7. Requirements Entry Page

The delivery agent is expected to reply to the WhatsApp bot with “delivered” to confirm delivery of the goods to the recipient. They shall receive a subsequent message requesting the upload of a photo of the recipient with the received goods if they so consent, which gets auto-updated in the image gallery on the landing page of the website.

IV. CONCLUSIONS AND FUTURE WORK

The web-based solution described in this paper makes charity an everyday, quick and easy, impersonal activity due to the instantaneous nature of the process and the absence of the need for the donor and recipient to know each other. Protection of privacy of the donor eliminates the potential hassle of a flood of requests which the donor may be unable or unwilling to fulfil, as often happens in the traditional case. Guiding features such as an explanatory animation of the request-based donation process in the ‘About’ page make the experience user-friendly and understandable to donors.

Our driving ethics are reflected in features like the special category to highlight oldest unfulfilled requests, allowing material donations from donors instead of only having them buy the goods, etc.

The recipient image gallery of real photos, donation tracking and donation history features, donation/delivery notifications and recipient request history all play a part in increasing transparency to users, which achieves a key goal of ForTheGood: showcasing the genuineness of our activity and building user trust, which would in turn bring in more donors and recipients and further the social cause.

The choosing of specific categories of recipients - government school students, orphanage inhabitants, differently-abled individuals and sub-staff of registered organisations - which provide opportunity for background verification, and the provision of recipient login credentials only after basic verification process, helps maintain genuineness of the requests. Future work could see this process more automated and have more ways of identifying genuine recipients not limited to the said categories.

The application may be enhanced with features like a web portal for vendors where they may view all items ordered from their store and confirm or postpone each one on the spot. Vendor affiliation procedure can be streamlined to include both brick-and-mortar as well as e-commerce ventures, increasing the reach and potential of ForTheGood as well as providing a good business opportunity for traders. Expansion to include bus/train tickets, utility bills, etc as viable requests which can be paid for by donors is another desirable future undertaking.

Most importantly, the adoption of strategies to market and create awareness about this platform, i.e., to increase the user base in terms of donors, recipients, vendors, through awareness programs, explaining the request-donation process, how to use the web application and so on, is a desirable undertaking.

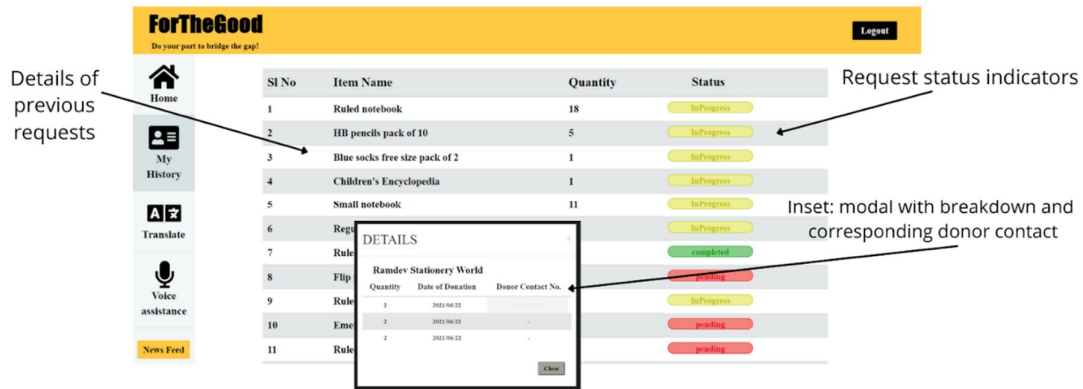


Figure 8. History Page

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