



CS3216

FINAL REPORT

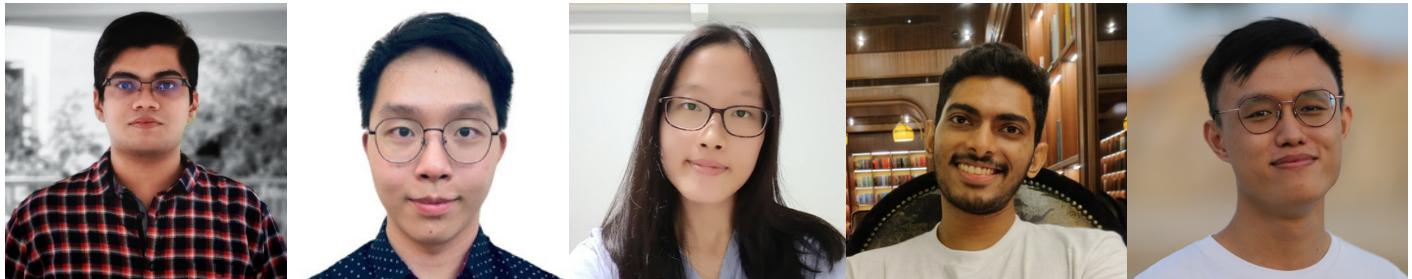


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Introduction

Giving Coupons is a social impact project with a mission to spread the joy of giving. There are many worthy causes that are in need of funds, and we believe that people would give more if they had the right nudge. Giving Coupons does that for them. Our aim is to encourage more Singaporeans to donate and foster a stronger culture of giving.

Every Giving Coupons campaign starts with initial sponsors. They commit a sum of money and choose a list of charities they want to support, and we split their contribution into coupons for distribution. The coupons can be distributed anywhere, to anyone, and each coupon recipient gets a choice on which charity the sponsor's donation goes to. At the end, they can choose to add on a donation of their own.

The coupon empowers the recipient by allowing them to make an impact on raising funds. For most people who rarely, if ever, donate to charity, this is a great way to get their foot in the door. Just putting the coupon in their hand alone generates awareness for these charities and their cause. Seeing that their choice has an impact, they are more likely to take the next step and add their own donation to the cause.

CHARITY LANDSCAPE



Gift Matching

Gift matching are programs ran in organizations where employees' donations to charities are matched by their employer. Often, the gift matching programs are capped at a certain amount and limited only to the organization itself.



Campaign Platforms

Platforms like Giving.sg exists for fundraisers to create online campaigns where people can donate directly to charities. These platforms are targeting deliberate donors who care more about the impact of their money. Although they donate more, the donations are not as frequent.



Donation as a Gift

There are also ways that people are offered a way to donate someone else's money, without any contribution. This can come as a gift service or as part of competitions / fundraising events to raise awareness.



Conventional fundraisers

Conventional fundraisers such as flag days, advertisements, concerts and cold phone calls are targeted at impulsive donors who donate based on their mood or the "spur of the moment". These donations are often smaller in amount and harder to attract repeated donations.

HOW WE ARE DIFFERENT

Giving Coupons aims to capture both impulsive and deliberate donors. Our model sources for deliberate donors and appeals to the impulsive donors through the coupons. Giving Coupons takes the next step and tries to create a ripple effect of additional donations. Leaning on the sense of accomplishment and feeling of goodwill for users who just selected a charity to receive the sponsor's money, the app prompts users to take the next step and donate too.



TIMELINE

METHODOLOGY

Our team followed the Agile methodology for our software development lifecycle. We followed a 2 week sprint cycle in line with the report submission requirement for the module. Tasks and user stories were planned before each sprint and assigned to members based on strengths and interests. In fact, in most sprints, we achieved more than what we planned for because we adapted quickly to the changing requirements. We also didn't miss a single planned task.

Additons to the original timeline are highlighted

Sprint 1		
Business	Engineering	Module
<ul style="list-style-type: none">Identify important user needs and wantsDesign a Lo-Fi mockup for the websiteSource for charities/campaigns/causes to work withSource for potential primary donorsResearch on potential legal issues with collecting donationsContact Stripe and Giving.sg for partnership	<ul style="list-style-type: none">Learn the tech stackSet up the repos for the frontend and backendDesign the schema and create the database modelsCreate validations for the modelsAuthenticationSnack bars and Frontend API abstractionAdmin Authentication PagesBackend controllersApplication themeNavigation barSimpleTable abstractionAdmin page Interest TableCampaign List Page	<ul style="list-style-type: none">Progress Report 1

Sprint 2

Business	Engineering	Module
<ul style="list-style-type: none"> Conduct User Test 1 with real users Plan a soft launch campaign in NUS Work on actionable items from user feedback and testing results Strategize project direction without partnership with Giving.sg Contact charities for User Test 2 Source for primary donors for User Test 2 Prepare pitch for primary donor funding for STePS campaign 	<ul style="list-style-type: none"> Implement the MVP (frontend) <ul style="list-style-type: none"> User Facing Pages Admin Pages Redeem Coupon Pages Contribute without Coupon Pages Complete all API endpoints and controllers Support image uploads Deployment Seed data for development Implement new redesigned UI 	<ul style="list-style-type: none"> Progress Report 2 Customer Contact Report

Sprint 3

Business	Engineering	Module
<ul style="list-style-type: none"> STePS Poster and Video Redesign Coupon Soft launch at NUS UTown (User Test 2) 	<ul style="list-style-type: none"> Bug-fixing from User Test 1 Implement Google Analytics Implement Firebase image uploads 	<ul style="list-style-type: none"> In-class Presentation

Sprint 4

Business	Engineering	Module
<ul style="list-style-type: none"> STePS Send donation breakdown report to all primary donors 	<ul style="list-style-type: none"> Polish UI and fix bugs Real-time statistics page for STePS 	<ul style="list-style-type: none"> Final Report

APPLICATION DESIGN

Giving Coupons is a web application built using Ruby on Rails for our backend and Next.js and React for our frontend, as well as PostgreSQL for our database management system. We use Nginx as a reverse proxy that forwards client requests to our Ruby on Rails server (Exhibit 1). Our application conforms to a Representational State Transfer (REST) architecture.

Frontend Architecture

REACT

Our frontend is built on React, a declarative and flexible JavaScript library for building user interfaces based on UI components. Because of the declarative nature and reusable components, we are able to iterate quickly in development and build a scalable application.

MATERIAL UI

We chose to use Material UI as our component library as it provides easy-to-use components out-of-the-box which supported most of our use cases. It was also easy to customize the theme to style our application the way we want.

NEXT.JS

Next.js is a production framework for building React applications. Next.js handles client-side routing and module bundling, allowing us to focus on development. Next.js also provides server-side rendering capabilities which we intend to explore, since it improves load times and is better for Search Engine Optimisation (SEO), making it easier for users to find our campaigns on the web.

OTHER LIBRARIES

- **Axios**, for making HTTP requests to interact with our REST endpoints
- **SWR**, as a wrapper over Axios that performs the HTTP cache invalidation strategy stale-while-revalidate, ensuring constant and automatic data updates and therefore a fast and reactive UI
- **Yup**, for frontend validation and displaying useful user-facing prompts
- **Firebase**, for storing images on the cloud and event-tracking analytics

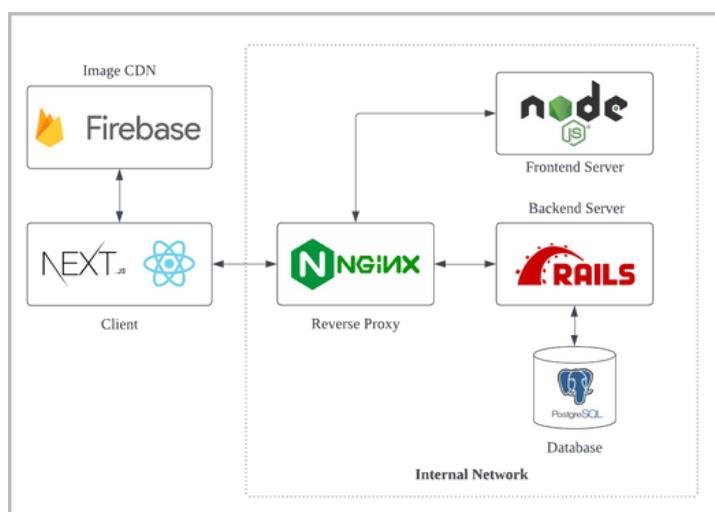


Exhibit 1: Giving Coupons Architecture Diagram

Backend Architecture

RUBY ON RAILS

Ruby on Rails is a mature server-side web application framework. Guided by *Don't Repeat Yourself (DRY)* and *Convention Over Configuration*, it provides rich features to make it easy to get a web server up and running. It also makes use of the Model-View-Controller (MVC) pattern.

MODEL VIEW CONTROLLER (MVC)

MVC is a design pattern that divides the responsibilities of an application to make it easier to reason about, and Rails follows this design pattern by convention.

DATABASE

An **interest** contains all the necessary information to start a campaign and is created when an entity completes the interest form. An **admin** then reviews the interest and if the interest is approved, a **campaign** is created using the information from the interest. The corresponding **primary donor** is also created if the email does not belong to an existing primary donor. A **campaign** supports one to five charities, tracked using the **campaign_charities** table. Each **campaign_charity** has an associated Giving.sg URL, the third-party service that handles all the donations for us.

When a **campaign** is created, a number of **coupons** ($\text{promised_amount} \div \text{coupon_denomination}$) is generated. There are a few scenarios for contributions in our application:

Coupon is redeemed without a personal contribution

A **redemption** is created that tracks the time of redemption and the receiving charity. The **coupon** is marked as redeemed with the presence of a foreign key *redemption_id* in the **coupons** table.

Coupon is redeemed with a personal contribution

In addition to the above, a **secondary donation** record is created. This **secondary donation** is associated with the coupon redemption using a foreign key *redemption_id* in the *secondary_donations* table.

Personal contribution is made without a coupon

Anyone can contribute to our campaign even without a coupon. Only a **secondary donation** is created, which tracks the donation amount and receiving charity.

Database Schema

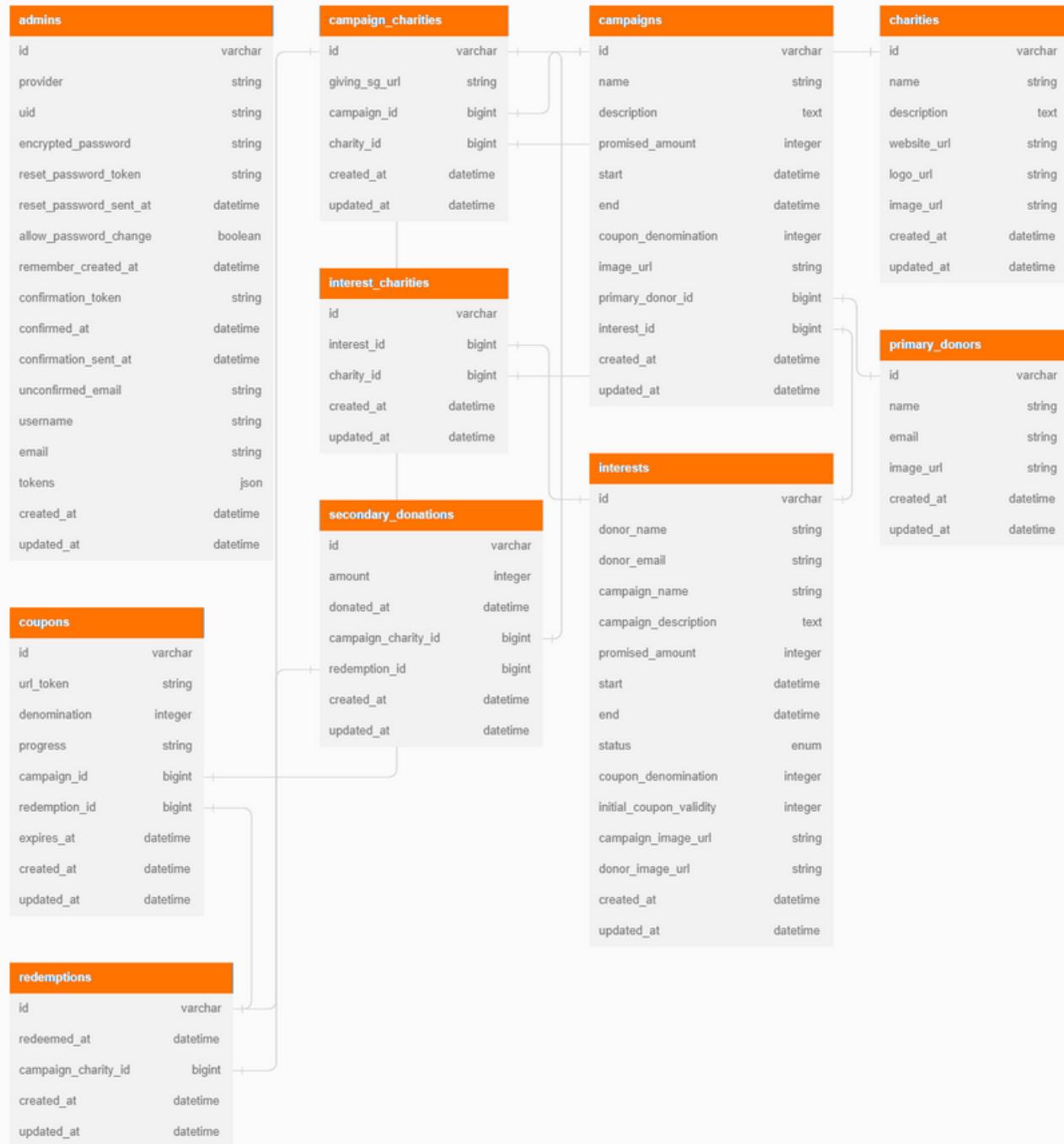


Exhibit 2: Database Schema

IMPACT



AMOUNT RAISED

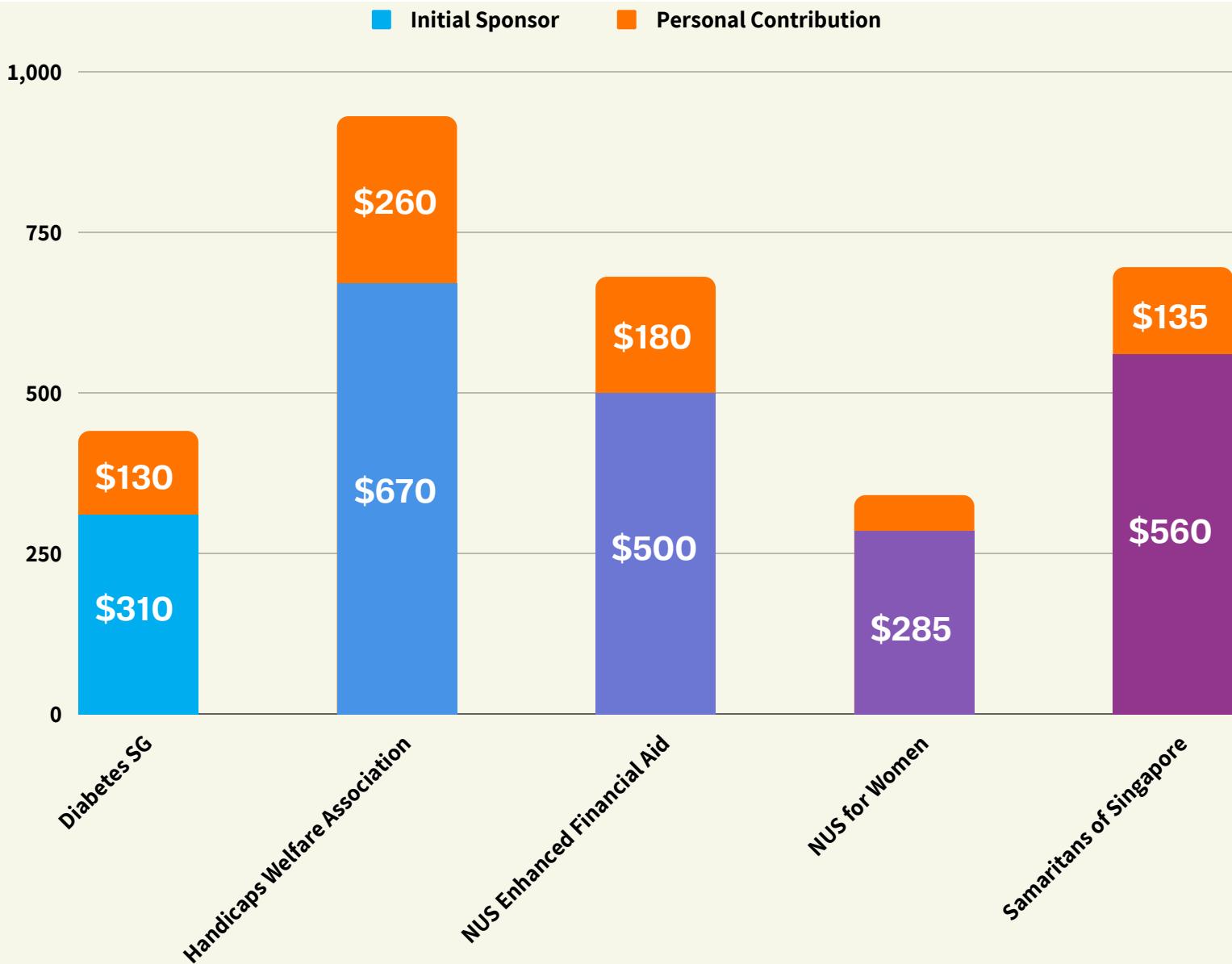


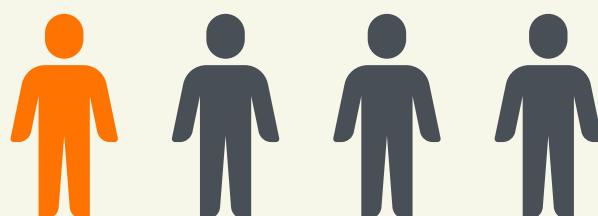
Exhibit 3: Donation amounts by individual charity

Over the course of the project we approached many charities and potential sponsors, and due to various operational concerns, we had to limit ourselves to the causes who were responsive and eager for a collaboration. At the conclusion of the project, they will have received \$3,085 in total due to being part of our project.

\$3,085
raised for 5 beneficiaries

33%

average return on initial
sponsor's money over 2
campaigns



participants personally
contributed at least \$10

FURTHER IMPACT

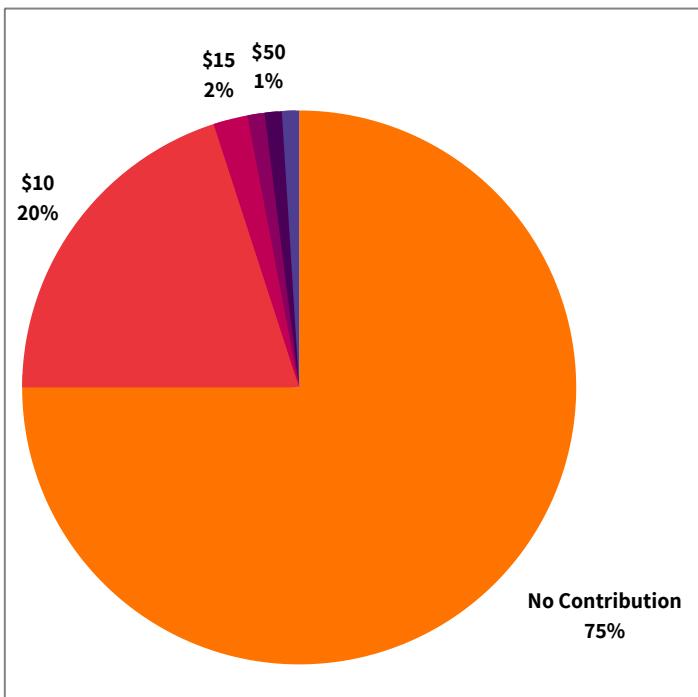


Exhibit 4: Breakdown of recipient contribution amounts

RECIPIENT CONTRIBUTION

Giving Coupons has a significant impact on increasing funding for charities by convincing the recipients to donate. Specifically, we found that 1 in 4 participants would provide at least \$10 (the minimum donation allowed by Giving.sg). There is also a small minority that would contribute far greater amounts, and as a result, on average recipients would give an additional 33% over the coupon value.

RAISING AWARENESS

Over the course of the campaign, we found that the Google Analytics suite could not provide a good gauge of unique users due to the blocking of cross-site tracking. As a result, we will be relying on the number of individual coupons as a proxy for individuals reached.

Naturally, each redeemed coupon indicates a user that has spent some time on the charity selection page and picked their chosen cause. Extrapolating from Google Analytics' record of events, at least 40% of users have inspected charity cards before making their decision. From this aspect, alone we can say that 220 individuals have been made aware of the causes and a significant number spent time on evaluating and internalizing the impacts before finally redeeming their coupon.

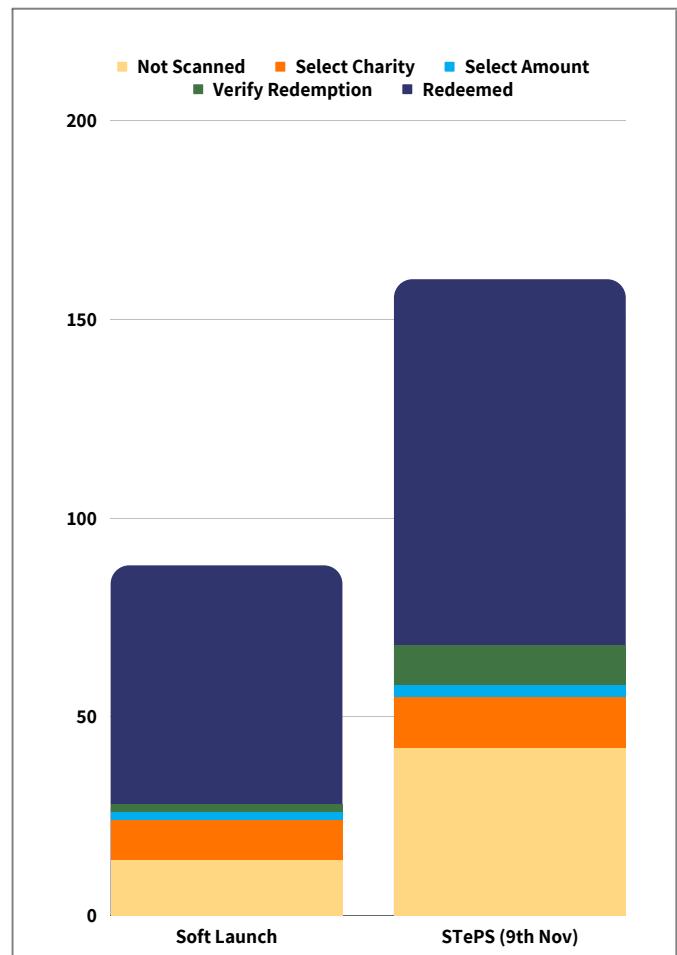


Exhibit 5: Furthest stage reached by users

Refer to the endnotes for data collection methods

FUTURE PLANS AND STRATEGIES

Short-term Plan

Over the next few months, we intend to add more features to make our application more robust. A feature that we initially planned for Sprint 4 but withheld from was the eCoupons feature, where coupons can be distributed through electronic means in addition to physical distribution. Our aim for now is to support an email service to send the email coupons from the admin panel.

We would also be ramping up marketing efforts so that more people understand what Giving Coupons is about. As this project involves potential monetary contributions from the coupon recipients, it would certainly be beneficial if we are able to brand ourselves as a trustworthy project.

Longer-term GTM Strategy

Since the start of the final project, our final goal was to push for Giving Coupons to become a nationwide movement similar to Giving.sg. From the campaign results collected, we have shown that the proof-of-concept is feasible and indeed generates a significant return on investment.

One way we can reach this goal is to integrate Giving Coupons with Giving.sg. Giving.sg has gained traction and trust from the public over the last couple of years and is seen as the way to donate. If we manage to form a partnership with Giving.sg, we would definitely benefit from their reputation and public reach, allowing us to gather more users quickly. Another advantage would be that we will be able to piggyback on their Institution of Public Character (IPC) status, allowing us to get over

many legal hurdles such as accepting donations directly. In the near future, we will be reaching out to Wayne's ex-colleague at Open Government Products (OGP) who will be on the National Volunteer & Philanthropy Centre (NVPC) board, the organisation behind Giving.sg and steward of the City of Good vision for Singapore.

As experienced during the first two weeks of the project, partnership with Giving.sg may not be as simple as we hope it would be. In case the above plan does not work out, an alternative roadmap would be for Giving Coupons to be registered as a Institution of Public Character (IPC) in Singapore. While this may involve many administrative processes and legal hurdles, this would give us more control of the project direction without being

directly accountable to external stakeholders. There will likely be less friction trying to integrate two portals together as well, which may involve major changes in the tech stack that we use.

Marketing Plan

Our marketing plan aims to bring in more users to build trust in our brand. It aims to publicise our brand as a transparent social good movement to gain acceptance amongst the general public and government, starting with Singapore.

Firstly, we would reach out to organizations like schools and companies to encourage them to use Giving Coupons to organize their fundraising initiatives. These organizations usually have routine fundraising activities like companies with corporate donation matching. Members in the organization trust the activities rolled out by the organization. If Giving Coupons is introduced to them by the organization, it is easier for them to trust and be willing to use Giving Coupons. On our end, it is also simpler to convince only the person in charge of the organizations to adopt Giving Coupons, rather than a broad group of public.

As a social good movement, credible data is required to convince the general public and government. During and after each campaign, data on the acceptance and returns could be analyzed and presented. More rigorous data and sound analysis or research may be needed to convince the government. For the public, more personal stories of how coupon recipients felt, or the large impact on beneficiaries can be published. These stories can be posted on social media like Instagram,

and archived on a news section of our page. The stories should be posted consistently to give a face to our app and improve our visibility.

We can also target content creators. There is a rise in Singaporean media dedicated to unravelling raw stories about different groups of people in Singapore. For example Channel News Asia with their documentaries and Our Grandfather Stories. These creators have social good at the heart of their content. If they are fundraising for any of the subjects of their content, using Giving Coupons for their needs is an effective way to publicise to a mass audience. They can also showcase their process of using Giving Coupons through creative means like street interviews to capture the attention of the public.



KEY LEARNINGS

Optimism and risk-taking are key to starting initiatives. Many ideas may seem trivial or challenging. However, most ideas make it big not because they are great ideas from the start, but because they are promoted well to make many people believe in them. At first, there was difficulty choosing an idea for the Final Project because it seemed like many ideas were done before in other ways, or too challenging to execute. Giving Coupons was also an idea that faced legal boundaries, and was hard to rationalise as a product. However, we chose it and worked well with it because we believed in the good parts of the idea. From there, we kept finding new ways of making it work and adding value to our target audiences.

A team should not commit too early into a solution without having any alternatives. In the first two weeks of the project, we found that Giving.sg has a developer API that we could apply for. This seemed perfect for our use case and it would eradicate many legal issues as well. We continued with the assumption that it would be straightforward to obtain access. When we were not given access, we were rather stumped on how we should move on and a couple of days was spent on discussing the workarounds. Had we come up with a Plan B from the start, we would be a lot more ready to handle an unexpected situation like this and our progress would be faster at the start.

Communication and consideration for others is important. Our thought process, intentions and plans have to be spelled out to help everyone be on the same page and to move forward efficiently. It is also important to be tactful for peace and so that everyone will be encouraged to contribute good ideas to make our project the best it can be.



ENDNOTES

Data Collection

- The recipients' contributions are based on our own Giving Coupons database data and have been cross-checked against the total values received with the actual giving sg campaigns. This means the charities have received the values specified by the recipients' contributions in our database.
- The sponsors' contribution (redeemed values) will still take a few weeks to be fully disbursed to these campaigns, and will not be reflected on Giving.sg campaigns for a while.
- The pie chart of recipient contributions does not show additional contributions made without a coupon, and therefore will not match total money raised.
- Google Analytics session cookies are known to have trouble with ad blockers and in-app browsers on both Android & iOS. As the redemption can often occur entirely within in-app browsers or in browsers with ad blockers depending on the user's set up, the discrepancies between our user data and Google Analytics was dismissed.
- We also investigated the users who began the process and failed to complete the redemption. Based on an informal survey of few known users (convenience sampling), we concluded it was due to deferring the decision and subsequently forgetting it, or frictions in the Giving SG donation flow. This also fits our data – 57.5 % of the churn happened upon reaching the charity selection stage, and 30% of the churn happened during the Giving SG stage.

