Digitizing the Pay-it-Forward process: a mobile app prototype.

A human-centered design and rapid prototyping case study.

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January 2021
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The "Pay-it-Forward, Contagious Kindness" was a winning solution to the Reboot Health & Wellbeing Challenge organized by the World Health Organization. In order to explore how to maximize its potential, a multi-disciplinary group of stakeholders followed a human-centered design approach to prototype a solution for digitizing the process to unlock its outreach potential and financial sustainability.

The goal of the initiative was to design a prototype relying on widely available technology such as mobile phones which could serve to run a pilot implementation of the Pay-it-Forward model to evaluate its viability and effectiveness. The prototype was designed to serve as a model for further development and implementation in a later phase.

Below is a brief explanation of the design and prototyping process, as well as the collateral materials, resources, and cost factors required to complete the prototype.

Overview

The Pay-it-Forward concept is designed to help individuals who cannot afford to get tested for sexually transmitted infections. This is done by offering people a free medical test and subsequently invite them to donate money to "pay forward" or invite someone to get a free test. A full description of the process can be found in the supporting materials provided by the Pay-it-Forward[1] team, as well as on a peer-reviewed paper which describes a randomized controlled trial conducted at testing sites run by community-based organizations.[2]

The prototype was designed through a human-centered design process and built using a "no-code" mobile app building platform which allowed the team to rapidly change elements of the app to respond to feedback received from users throughout the development process.

The prototype results included interactive apps (Android, iOS, and web apps) which can be used on a mobile device to experience the workflow. In brief, the workflow consists of an individual at a community testing center who uses his/her mobile phone to scan a QR Code from a poster

[1] https://ideas.unite.un.org/reboothealth/Page/ViewIdea?ideaid=6084
[2] https://www.researchgate.net/publication/335256086_Pay-it-forward_gonorrhea_and_chlamydia_testing_among_men_who_have_sex_with_men_in_China_A_study_protocol_for_a_three-arm_cluster_randomized_controlled_trial

displayed at a community testing center to obtain a voucher that entitles her/him to a free test. This is followed by an invitation presented on the mobile phone to donate to a financial pool for other people to get free tests, and by the opportunity to "share" from that individual's mobile phone to his/her contacts. The last step is a critical outreach tool as individuals are persuaded to get tested because they receive the invitation from a trusted person.

The prototype included native apps (Android and iOS), however, the design team sought to minimize the steps required from users. The team stressed that it was important that the individual receive the expected service without having to install (download) any app from an app store, therefore, the preferred option was to rely on an adaptive web app.
The design team included community organizations based in China, where the user base for the target pilot was located. This user base was very comfortable with the use of mini-apps embedded in local platforms such as WeChat and was reluctant to install new apps that incur data download fees and require time. Therefore, the team opted for simulating a workflow that could be adapted to the WeChat mini-app environment, while remaining transposable to other countries in the future.

What are the Human-Centered Design and Rapid Prototyping concepts?

Human-Centered Design is a creative approach process for solving problems that begin with understanding the users' needs (See Figure 1). To do so, users are involved in the conception and refinement of the solution so that the new concepts, processes, and tools are tailored optimally to their requirements and needs.

Rapid prototyping refers to techniques used to produce realistic simulations or models of a new system, process, physical tool, or other concepts, to quickly experience how the final product might look. Rapid prototypes are built to increase the probability that the final product will be suitable for the users' needs in the shortest possible amount of time.

Combining human-centered design with rapid prototyping is done to gain efficiency in balancing what the users desire from an end product with a feasible technological deliverable and a realistic implementation plan for the given circumstances.

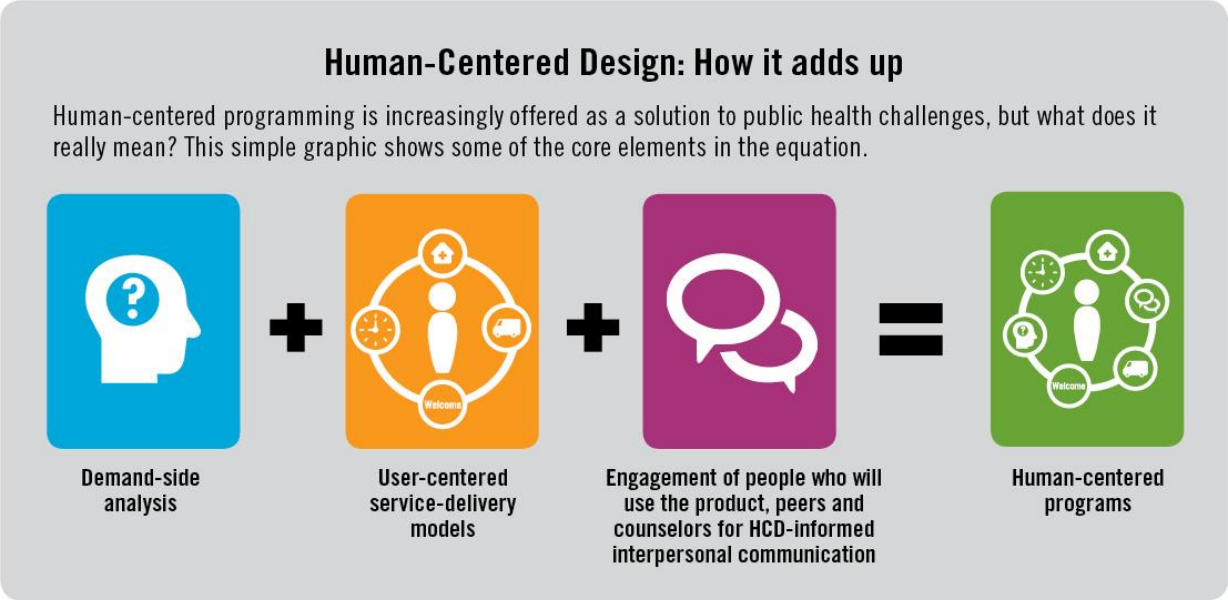


Figure 1: Core elements of Human-Centered Design. Source AVAC Report 2018.

The Design and Prototyping Process

The rapid design and development process for this prototype lasted 15 days, of which the first 10 days included 3 workshops (held via internet video-conferencing with participants located on three continents) with representatives of the target user group as well as the stakeholders associated with this initiative. The workshops were essential to the development process due to the presence of a diverse group that provided valuable insights and feedback to optimize the app design.

Throughout the workshops, health experts, community organizers, system designers, and programmers held interactive discussions and gave feedback on workflow diagrams and mock-up mobile application designs (See Figure 2). After each workshop, the team would prioritize requirements, analyze the change impact, and update the prototype immediately to discuss with the team during the next workshop to further discuss and gather feedback.

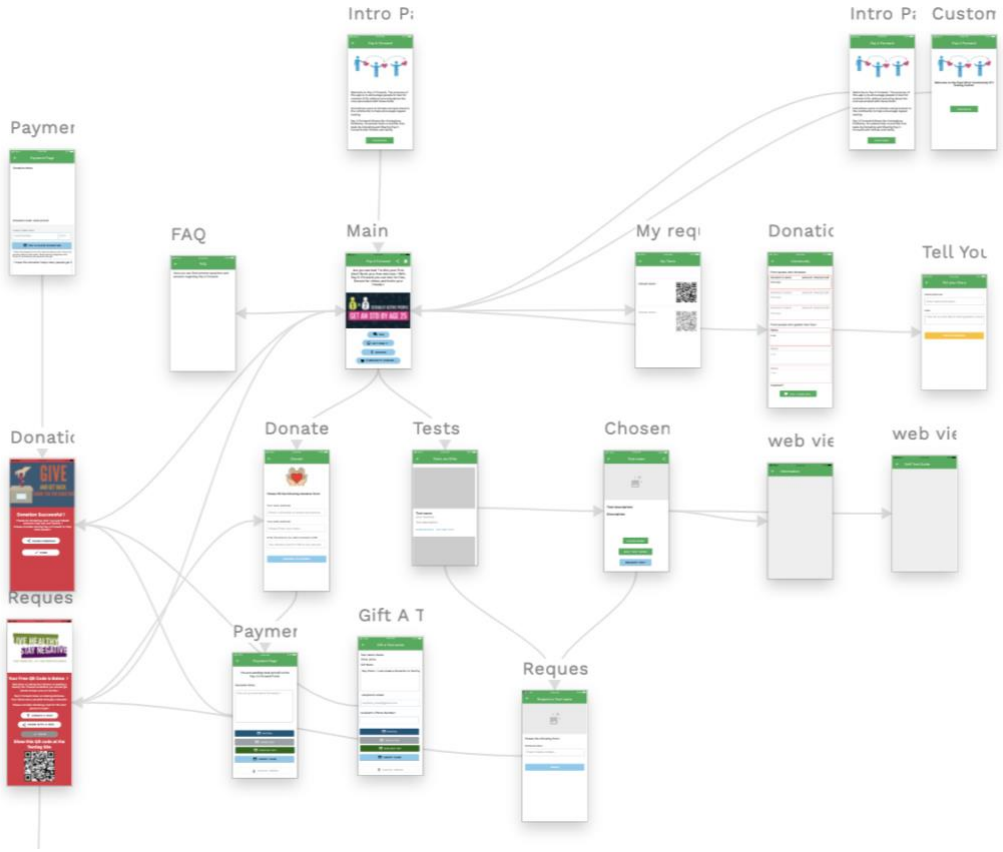


Figure 2: Design canvas using the no-code environment for rapid prototyping.

The 10-person design team included private individuals from the target user communities, members of the Pay-it-Forward team, the Southern Medical University (China), the University of North Carolina (USA), Blued (private-sector, China), personnel from the World Health Organization, the UN ESCWA Technology Centre, and the UN Office of Information and Communications Technology.

Resources, Cost Factors, and Perspectives

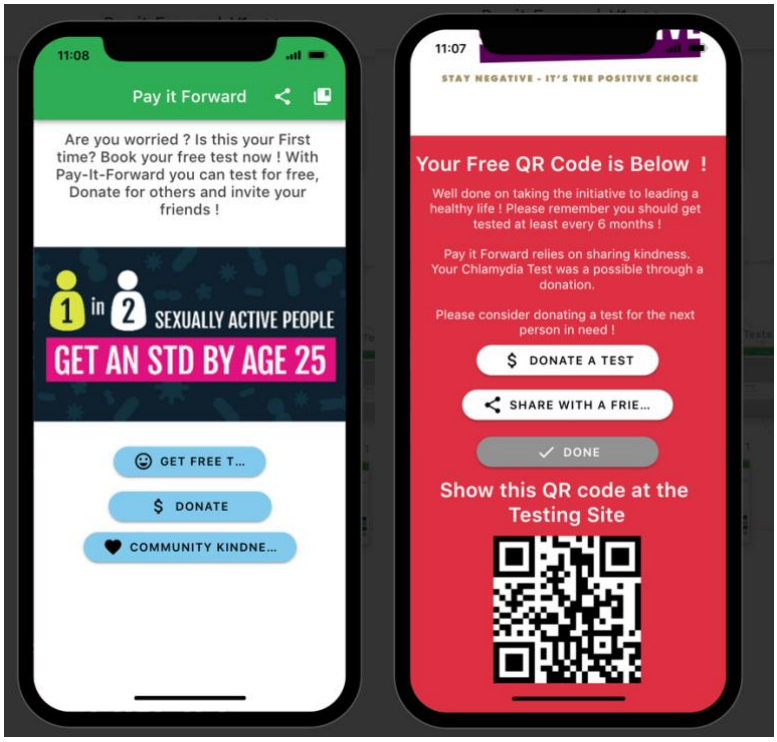
In terms of human resources, the design and prototyping process required approximately 150 person-hours in total, divided approximately as follows: design process (60 hrs.) by a group of 10 user representatives and stakeholders; system prototyping (50 hrs.) by a system engineer; and overall project management (40 hrs.). For rapid prototyping, the team relied on a cloud-based platform provider (Adalo.com) which simplified the development of cross-platform native mobile apps and web apps for a monthly fee of under two hundred US dollars.

Altogether, the process to go from the initial idea to have a working prototype was very efficient. As a result, the stakeholders initiated a translation and localization of the app for piloting a WeChat mini-app version at a community testing center in southern China.

Prototype and Collateral Materials

Scan/Click to Access

Screenshots:



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Zhang, Tiange P., et al. “Pay-It-Forward Gonorrhea and Chlamydia Testing among Men Who Have Sex with Men in China: A Study Protocol for a Three-Arm Cluster Randomized Controlled Trial.” *Infectious Diseases of Poverty*, vol. 8, no. 1, Dec. 2019, p. 76. *DOI.org (Crossref)*, doi:10.1186/s40249-019-0581-1.