

Notifications and their effect on gratification in a peer to peer donation smart phone application

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ABSTRACT

Homeless populations are having difficulties adjusting to the transition towards a cashless society, and donors do not currently have a standardized way to donate electronically to recipients they meet on the street. This study proposes an application that will make an electronic transaction between a donor who has a smart phone and someone with little access to technology possible and cost effective. The study will also improve upon the proposed application by implementing a notification system in order to provide gratification for donors. This will provide a benefit that even cash donations cannot compete with, enticing users to stay loyal to the QR donation platform and potentially becoming the standard for peer to peer donations.

Keywords: QR, HCI, Donations, Cashless society, Gratification

Introduction

Payment technologies have been advancing rapidly in the past decade, bringing us closer to a truly cashless society. Payment services like PayPal, Venmo, Credit Cards, Debit cards and eTransfers have become standards in large value transactions. However, small peer to peer transactions are still 75 percent cash (Figure 1). Homeless populations who rely on pan handling as a main source of income are finding it increasingly difficult to obtain physical currency as most potential donors do not carry any on their person. Solutions for this problem involving smart phones and QR codes have begun to emerge but nothing has become the standard for on street donations.

The solution that aims to replace cash donations would need to be easy and quick on the surface level as the convenience of cash (when available) is still what most donors will gravitate towards naturally. This can be implemented with a readily accessible smart phone application that has a clean user interface with a quick payment scheme. The other challenge to make an application appealing to a

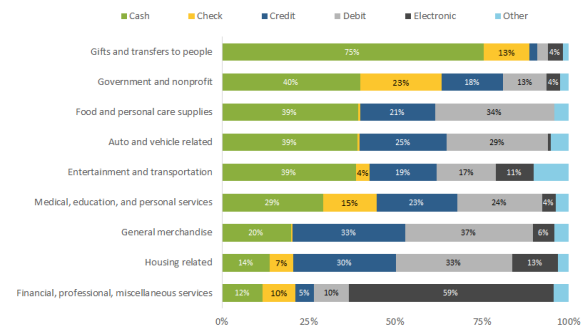


Figure 1. Peer to peer transactions are made predominately with cash.¹

donor on the street would be satisfaction or gratification they may get from providing a in-person cash donation. There are certain positive emotions that the user can receive from the interaction, increasing their level of gratification as they walk away. This study developed an application that attempts to enhance this receipt of gratification by providing the user with notifications that can provide more feedback about where and when the donor's contribution is being spent. The study hypothesized that these notifications would overall increase user gratification in the context of donations.

Gratification is the focus of this study instead of speed and usability as it is likely to be the main

reason for a donor to decide to donate. Even though the act of initiating a donation appears to be altruistic, it has been found that the decision-making process stems from selfish motivations². The primary motivating factor for a donation may in fact be to make the donor feel better about themselves with the additional side effect of helping someone else. The person may also be praised socially for being seen as altruistic and will likely be encouraged to give again. These raise some interesting questions which have led to some new simple strategies to increase repeat donations. Blood donation organizations have found success in providing donors a text at the exact moment their blood is used which has shown to increase repeat donations from young users³. Donor retention is a major problem for non-profits who rely on donations but suffer from 90% donor attrition rates due to the lack of feedback they provide⁴. Not seeing the immediate effect for an action (like a donation) has been shown to psychologically discourage the action from being repeated³.

This study implemented a notification system similar to the one employed in the previously mentioned blood donation study, but instead used e-mails to notify the test participants. The notification would notify the test participant at the exact moment and location that the donation was spent. The recipient would have a business card sized donation card that can be seen in Figure 2. These cards would be a cheap scanning medium that could be mass-produced for recipients to carry. The balance that is accumulated on the spending card would then be spent by the recipient at partnered locations that are decided by the application developer. This will give the donors the comfort of knowing that their donations could only be spent for what they were intended for. With the combination of ease of use of QR code scans⁵ and a system that allows the user to feel gratified, this application could create a standard for giving to those who are homeless. The resulting application has the transparency that younger generations today expect when donating their money⁶ and will be budget friendly so that wide adoption would be maintainable by a non-profit or social enterprise. Ultimately, the applica-

tion created for this study helps solve 4 major utility problems that cash donations currently have:

- Not having physical currency on person
- Worrying the donation may not be spent on what it was intended for
- Feeling unsafe about pulling out wallet or cash
- Potential to feel uncomfortable with the donation interaction



Figure 2. The business cards that recipients would present to the user donating through the application. The QR code would likely be a printed sticker that would later be put on the card to save costs.

There are some challenges to be expected when creating phone applications. The mass market adoption of an application such as this has many barriers to entry. This application would need to be downloaded from the App Store but the average amount of apps a user downloads per month is zero⁷. The app store has become a flooded market and most users only use a handful of apps they are familiar with, uninstalling any apps they don't use anymore.

Therefore, it is important that the app has a premium user experience and is easily obtainable by scanning a QR code on the back of a recipient's card.

Security is always a challenge when dealing with payment transactions. The application will be using bio metrics to verify identity and the Stripe API to handle the payment transactions. The identity of the recipient will not be displayed on the QR card as to ensure privacy.

Method

The data in this experiment was gathered with formative usability testing using a two part survey. The first part of the survey was an in person meeting where the participant is initially asked to answer the first question on the survey before being told any further information. After this, the participant received an explanation that the study is to test the experience for an app meant to help make donations to recipients they meet on the streets. The participant was then asked to imagine a scenario where a homeless recipient may approach them on the street. The homeless recipient would then ask for a cash donation to which the participant cannot provide, so the homeless recipient pulls out a business card with a QR code (Figure 2) asking if the participant has the app. The participant was then told that we are assuming that the app is already on their phone in the imaginary scenario. After this the surveyor showed the user experience flow of the app (user flow shown in Figure 3), where the QR code was scanned until the point where the purchase goes through using Apple Pay(with bio-metric fingerprint). The participant was told the purchase was a real transaction and will be a donation made in exchange for their participation. After the demo, the participant finished the rest of the survey where they selected a donation recipient name and rated the app experience. After the survey the participant was told to expect one or two e-mails with a survey the following day.

The second part of the experiment involved sending an e-mail to only half of the participants. This e-mail contained a statement notifying them that

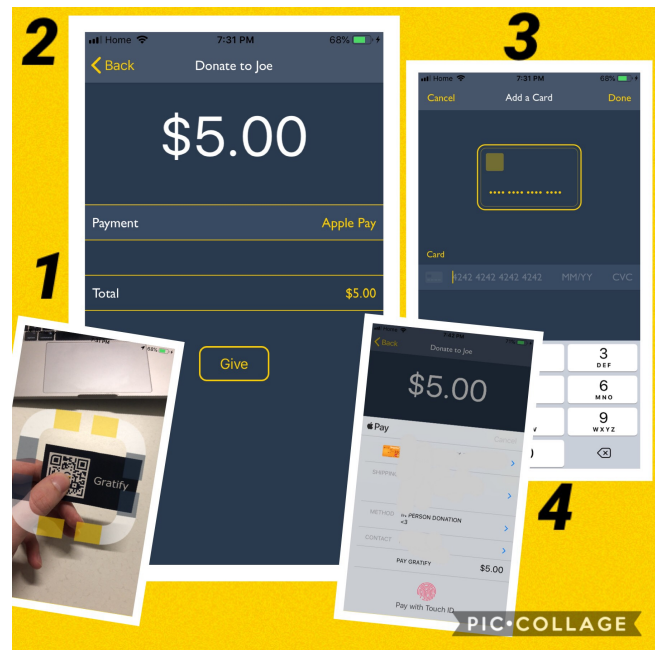


Figure 3. Step 1: User scans the recipient's QR code. Step 2: User selects a donation denomination amount. Step 3 (Optional): If user does not have Apple Pay, can manually input credit card information. Step 4: User confirms donation with bio-metric fingerprint (if using Apple Pay).

their donation had just been spent (in-real time) by the name they selected at a local food establishment. The other half of the participants are the control group. Every participant is sent the same follow-up survey.

The participation pool sex ratio for the first survey was 50 percent male and 50 percent female with the pool total equaling 18. The target group for the participants was students (aged 18-24), as they are more open to adopt new technologies³. The participants were selected and solicited to complete the survey at random. Selection bias for participants was minimized with a low choice strategy. The surveyor went to the University during a Saturday and Sunday evening where the selection pool was smaller compared to a normal school day.

Results

The participants were first asked what they consider the largest challenge to be when donating to

a panhandler they may meet on the street. The results showed 2 major concerns: the highest concern being lack of possessing pocket change (78% of respondents) and the second highest concern being worried how the money may be spent (44% of respondents) as shown in Figure 4.

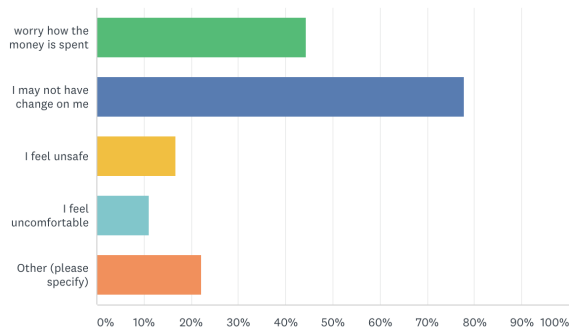


Figure 4. What participant's consider the biggest challenge when giving an in-person cash donation.

The participant's were then asked to manually enter one word to describe the transaction experience which is shown in Figure 5. The only words that were repeated were Fast, Easy and Simple; each being repeated 3 times.



Figure 5. Word cloud of participant's free form one-word description of the app transaction. Bigger words are repeated.

The participant's were asked to rate their level of satisfaction regarding the transaction as shown in

Figure 6. Participants were 60% satisfied, 28% very satisfied with only 10% deciding that they were neutral in their level of satisfaction.

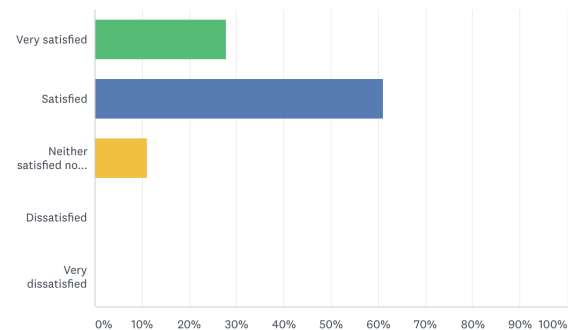


Figure 6. Participant's level of satisfaction regarding the transaction.

For the second part of the study, participants were asked to fill out a follow up survey that was sent to them through e-mail. Only 50% (9 respondents) completed the follow-up survey. Of the 9 participants that completed the follow-up survey, 5 of them were part of the test group and 4 of them were part of the control group. The control group showed 0% change in satisfaction in the positive or negative direction while the test group showed 40% of participants were more satisfied (Figure 7), 20% less satisfied with a net satisfaction increase of 20%. Due to the small sample of categorical data, a Fisher's Exact Test was performed ($p = 0.2857$) showing that the upward trend is not statistically significant.

The final question asked to rate the participant's likeliness to recommended the app in the future (0-min, 5-max). The control group provided an average rating of 3.0 (min of 2, max of 5) while the test group had an average rating of 3.8 (min of 3, max of 5). The test group is 16% more likely to recommend the app in the future.

Discussion

The first question of the survey served to see what difficulties participants thought they would experience in the scenario they were presented (as seen in Figure 4). It was expected that the most important challenge would be not possessing physical

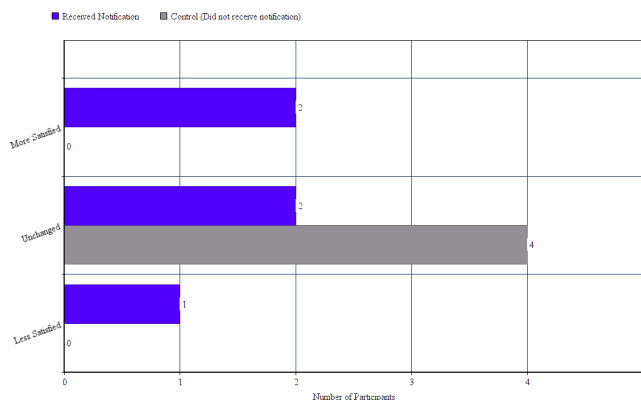


Figure 7. Result: Comparison of the control group with the test group of the gratification level difference since the initial transaction.

currency since most payments are cashless now⁶. The second highest response was worry that the money may not be used what it was originally intended for. This was also expected as this is a major concern shared by the British government's attitude toward beggars⁸. Some participants wanted to answer "none of the above" but were unable to as the survey question only had an "Other: please specify" option. The 4 challenges in this survey question are all theoretically addressed by an app such as the prototype that was shown to the participants.

The word cloud in Figure 5 shows that 94%(17) of the participants used a positive word to describe the transaction with only one word possessing a negative connotation. The only three words that were repeated were fast, easy and simple. This is very promising as the app would have to rival the simplicity of a peer to peer cash donation. If the notification adds more value compared to a cash transaction, then it may increase the chances that a system like this could be widely adopted.

The test for this study was determined by the respondent's follow-up survey. The initial survey was completed by 18 participants but the follow-up survey was only completed by 50%(9) of participants. The lack of follow-up in this participation had made it difficult to obtain a result that could be optimally statistically tested. However, this appears to be a

typical occurrence in formative user testing where 82% of such studies have less than 15 test participants but achieve the feedback they need with a minimum of 5 users⁹. The results from these type of tests can often provide usable results in a user experience testing scenario that can be safely acted upon without the confirmation of statistical significance. This study may just need to involve a larger initial survey participant pool with the expectation that 50% will not complete the follow-up survey. Based off of this studies' participation, an initial pool of 40 participants should suffice in a continuation study. The alternative would be to change the structure of the study so that it avoids a follow-up survey and tests the receiving of a notification during the first survey completion (which may be challenging to emulate how the real app would work).

There was a participant in the study who was in the test group (that received the notification) who stated that they were less satisfied since the initial transaction. Their explanation for this was due to their own research they found "people can handle to pay rent and this app would not allow them to do that". It should also be noted that this participant was an outlier in their response time to complete the follow-up survey, as they completed it 3 days after the suggested time. The rest of the test group had completed the survey almost right away (within a few hours, where they received the notification earlier that day). This may suggest that the participant could have possibly forgot about the notification they had received. It is also possible that the participants who did receive the notification formulated a more polar opinion about the application due to Figure 7 showing more variance (in both directions) compared to the control.

The last survey question shows that the test group is 16% more likely to recommend the app. This statistic may not necessarily support the hypothesis however, as the higher rating could be attributed to the simplicity and fast transaction experience of the app and not an increase in gratification.

Summary

This study used formative usability testing in order to determine if a notification can influence a user's feeling of gratification. The results found that there was a small trend where users felt slightly more satisfied with the transaction when receiving the notification, compared to the control who's satisfaction levels did not change at all. A continuation of this study would be required to collect more data as there was not enough follow-up participation. The results were not found to be statistically significant.

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