

# Bitcoin Donation Transparency

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## Motivation:

Since watching a VICE segment titled “Haitian Money Pit”<sup>1</sup> in the spring of this year, I’ve become more attentive to the vast issues inherent in US foreign aid. I was shocked by the blatant inefficiencies and corruption marked by “relief” measures after the Haitian earthquake in 2010. USAID dispersed aid money to for-profit and non-profit companies who’s use of the money is essentially untraceable. There are still vast tent cities lacking drinkable water and sanitation. In the mountains outside Port-au-Prince, an \$18 million dollar soccer field was built in the midst of a tent city lacking sewers and electricity. In most cases, only very small amounts went directly to Haitians. Yet, all research and discussion I’ve read indicates that giving directly to locals is the most effective use of aid money. With the rise of Bitcoin, which allows peer-to-peer transactions, I saw a possible opportunity to apply Bitcoin for a beneficial use.

For this project, I set out to explore different options to improve transparency and accountability for donations. I at first hoped to perhaps determine a solution for foreign aid accountability; however, I soon realized the infeasibility of such a goal. Foreign aid is managed largely through government agencies which don’t put a premium on transparency in the first place. Expense reports are often classified or not released to the public, as was demonstrated in the VICE video. The application of some Bitcoin transparency system in government foreign aid, therefore didn’t seem to be a worthwhile pursuit; the institutional concerns provide too significant a barrier. Therefore, I turned my focus towards transparency for donations from individuals to non-profits. I figured that smaller non-profits could benefit from a transparency system which is attractive to certain donors.

## Background:

My first goal was to determine how current non-profits handle transparency and accountability. Most non-profits have a significant impact on the sector in which they’re involved. They might provide useful programs, necessary supplies, or direct monetary aid to individuals. However, measuring their own impact and providing transparency is certainly a trouble spot for most. There’s first of all the fact that some aid simply can’t be accurately measured. Providing developmental training to individuals is extremely beneficial, yet its impact isn’t easily demonstrated. How does a non-profit measure the increased confidence and skill they’ve provided someone? A quick measure seems to be the number of people helped or the amount of money spent on each individual. However, that seems reductive—each individual requires different levels of help and receives different levels of benefit. On the other hand, the impact of providing the funds to build wells in Africa can be more easily measured. The cost of the project is more meaningful considering it’s going towards materials and the use of the well

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<sup>1</sup> “Sweet Home Alabama & Haitian Money Pit” VICE. HBO. 24 Apr. 2015. Television.

can more easily be measured as well. Therefore, some non-profits with more measurable impact have an advantage in their ability to communicate it.

A recent study from 2013 called *Money For Good UK*<sup>2</sup> examined what motivates individual donors to donate, finding that transparency and impact were key factors. It found that “there is a considerable opportunity to increase donations, and if charities want to realise this they should invest in tackling the two main areas of underperformance identified by donors: providing evidence of impact and explaining how donations are used” (Bagwell 68). It’s in the interest of non-profits to increase their transparency so that they can attain more donors.

Non-profits try to communicate impact and transparency in several ways. Social media seems to be the go-to method. Pictures and videos of clients participating in programs or receiving the benefits of new aid allow non-profits to visually communicate their impact. A donor can view media of different programs and relief as time goes by and imagine their donations providing for them. Other nonprofits such as SolarAid have impact calculators where donors can input a dollar amount and see how many solar lights would be provided and how many people they would benefit (<http://www.solar-aid.org/online-impact-calculator/>). Charity: Water has a more developed transparency system called “Dollars to Projects” which matches dollar values of donations up with actual completed projects. A donor receives a “Project Detail Report” which provides several details such as the location, type of project, number of people benefitted, total cost, and all the donors who contributed. Both of these systems provide a higher level of transparency; however, they don’t necessarily determine where your money actually went. For charity: water, you just know that the amount you contributed went to a certain project, not that it was actually your money. Additionally, the system is retroactive where the donor doesn’t hear about the benefit she provided until several months later.

Perhaps the most compelling example of transparency that I’ve found is a startup called Watsi ([watsi.org](http://watsi.org)) which is based entirely on the idea of transparency and efficiency. They are essentially a crowdfunding platform which connects donors directly with individuals around the world who are seeking funding for medical care. When an individual’s treatment is fully funded, they send the funds directly to the medical center and record all information in a public Google doc ([https://docs.google.com/spreadsheets/d/1tZq47h6jg7NX4ddhTS\\_H8JFVfLZiDbxwwdQD47\\_ow64/](https://docs.google.com/spreadsheets/d/1tZq47h6jg7NX4ddhTS_H8JFVfLZiDbxwwdQD47_ow64/)). They guarantee that 100% of donations go to the funded treatments and include screenshots of PayPal payments to the medical centers in the Google doc. This method certainly appears to be an effective implementation of transparency.

I therefore set about determining whether there was a way to implement a similar system on the blockchain, where the information is likewise public and additionally unchangeable. This system would most efficiently be used by a non-profit that deals with transferring money for easily measurable benefits. It should be noted that non-profits that deal with the development of individuals are unfortunately at a disadvantage here, and donors should be careful not to assume that low measurability means low impact.

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<sup>2</sup> Bagwell, Sally, Lucy de Las Casas, Matt van Poortvliet, Rob Abercrombie. *Money for Good UK: Understanding donor motivation and behavior*. London: New Philanthropy Capital, 2013. Print.

## **Explanation:**

My goal was to establish a protocol for the donors and non-profits and to implement a basic system which enables such a protocol. Bitcoin presents certain issues in designing such a transparency system. First of all, a donor must maintain basic trust that a non-profit is who they say they are and that their mission is as they say. This system aims to provide transparency after all, not to guarantee that the funds are used correctly. Unlike Ethereum, there are no contracts in the Bitcoin protocol, so once the money is donated, there are no actions a donor can take to enforce accountability or attain a refund. The donor isn't expecting anything in return immediately, so multi-sig transactions aren't very useful either. Additionally, a donor must trust that a non-profit will correctly identify the recipients of successive transfers. Since it's difficult to connect an address with an individual or organization's identity, the system relies on the non-profit providing that information for us. An implementation of taint analysis and/or use of the WalletExplorer API could possibly be used, but not to great affect. Finally, there's no information provided in the blockchain regarding what a transaction actually purchases. The non-profit could provide the type of good and quantity purchased and the system could check if the data matches average prices; however, this technique lacks a large amount of precision. We therefore must rely on the non-profit to announce what it purchased as well. Providing transparency is beneficial to the non-profit, so we rely on the organization to proceed truthfully.

With that basic level of trust established, we can then begin to formulate the protocol. This protocol builds upon the basic Bitcoin donation protocol and uses the BlockCypher Metadata API which allows key-value data to be associated with transactions and addresses. The protocol can be described accordingly:

1. The donor sends bitcoin to a unique address specified by the charity. A new address is generated for each donation.
2. When the charity decides on a use for the funds, it creates a new transaction to the desired business or entity.
3. In addition to broadcasting the transaction, the non-profit will add metadata to the transaction with the BlockCypher Metadata API. This key-value information can provide the purpose, recipient, date, location, status of the project, and other data the non-profit decides is useful.
4. The donor can then view this transaction and the metadata as soon as the transaction is confirmed.
5. If a project reaches its completion, the non-profit will include the metadata { 'complete' : 'true' }. That way a donor will know that the following transactions aren't related to their own donation.

My implementation of this protocol essentially provides the donor with a basic blockchain explorer that displays the metadata associated with certain transactions. For the non-profit it enables the easy association of metadata with a transaction.

## **Results:**

My implementation has several advantages and drawbacks. First of all, by working within the Bitcoin protocol, it can be used currently without needing any additional technology. The system provides a way to track transfers and purchases as they happen, rather than waiting several months to receive a report or receiving no report at all. Additionally, if (ideally) the transfers remain in bitcoin and the metadata is maintained, a donor will be able to track transfers to a more specific level than Watsi allows. A donor could see transactions going from the hospital to medical supply companies or to electricians and contractors. All this information serves to increase donor engagement and provides transparency regarding the use of funds. Transactions in Bitcoin also have the added benefit that remittances to other countries require significantly lower fees as compared to dollars. This transparency protocol is therefore especially advantageous for non-profits who deal primarily with international transfers.

There are, however, significant challenges in implementing such a solution. This system obviously requires significant technical overhead for both donors and charities. Entering the world of Bitcoin certainly constitutes a significant obstacle to participation. Additionally, tracking transactions is significantly less useful if we can only monitor one level of transactions. If the non-profit immediately sends the donation to an exchange, we can't actually track the funds. Security of the metadata could also provide a problem considering that BlockCypher maintains it rather than it being completely within the blockchain. Finally, this high level of transparency could provide administrative challenges for non-profits in dealing with all the individual transactions. However, if they use a modern wallet, it will automatically join together amounts from different addresses to reach the amount needed for a certain transaction. Overall, the biggest challenge is simply adoption of Bitcoin by the average donor and non-profit.

Considering these challenges, there are certainly improvements that could be made to this system. For example, a more developed third-party implementation could take in dollars and convert to bitcoin for the actual transactions, thereby retaining the tracking aspects. Keeping Bitcoin beneath the hood would all but remove the technical barriers for donors and non-profits.

## **Summary:**

In conclusion, I've formulated a protocol using Bitcoin which would provide better donation transparency to donors. This additional transparency increases engagement and has been identified as a factor that increases a donor's likelihood to contribute. It would therefore be beneficial for more non-profits to leverage such a system. Unfortunately, this system doesn't provide a good solution for non-profits whose impact can't effectively be measured in dollar amounts. Therefore, while Bitcoin tracking provides a good solution for some non-profits, it is certainly not a universal solution for the significant problem of demonstrating donation impact.