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Bitcoin at Point of Sale

(1) Motivation.

My interest in Bitcoin at POS stems largely from working with a Richmond-based startup on a similar usability challenge for ACH payments. During that time we found there were lots of merchants who wanted to use ACH for reasons like low transaction fees (as compared to card transactions) but can't force it on their customers, and their customer's didn't really want to use it in ordinary transactions because remembering and then typing your account and routing number repeatedly is slow, prone to error, and people generally don't want to share that information with many merchants. I thought initially though bitcoin's problems could be solved with a similar application of ingenuity on the user interface side, but quickly discovered that the problem was much more low level and technical than and end user payment terminal.

(2) Background

To get a better understanding of how current settlement systems work I looked a lot at the ACH network and Vias/Mastercard's settlement networks. This article sparked my interest in payment networks and how they actually enable settlements across banks, currencies, and borders. VISA is basically a standard set of rules agreed upon by everyone who wants to buy into the network and outlines the protocols for settling transactions between different institutions. The idea of buying into a network of individual actors/miners translates nicely to bitcoin.

A large component of VISA's worth as a network is in their specific protocol for handling unauthorized or fraudulent transactions which can cost merchants a lot of money and bring headaches to the victim end user of the network. Who eats that cost? It is from here that I realized probably the biggest hindrance to bitcoin's adoption at point of sale was this issue and lack of a settlement network where the merchant is left exposed to double spend transactions and takes all the financial hit. Bitcoin doesn't really need this settlement network with online goods because the merchant can withhold shipment of goods until the transaction is confirmed, however in an in-person store setting they have no such guarantee.

In a point of sale system, buy the time a merchant realizes they have been victim to double spending, the person in question is already gone (presumably with some goods/groceries/etc.) and with no names or way to trace the customer as with credit cards, the merchant can't really do anything and takes a loss. This is when I realized that the key to bitcoin's success at point to sale rides more on the ability to reconcile that potential expense and mitigate the financial risk of accepting bitcoin to attract merchants to accept with coin and join the network.

How MasterCard Payment works
How Does Visa Work
Visa - Accept Visa Payments

(3) What I did.

I researched point of sale systems currently in use on the bitcoin network. I looked at their processing fees and policies and terms of use to find out who was carrying the risk of a bad

transaction in the event of a double spend and compared that to the visa network's policies about refuting transactions and dealing with bad transactions.

(4) Results (please see project: http://kukla1234.github.io/project)

I found that unlike what I first expected, the user experience issues and the economic feasibility for Merchants when using bitcoin as a POS payment method both converged on the same technical challenge — not an interface one. How confident can you be a transaction with zero confirmations will be valid and therefore included in the block chain?

I expected the the payment terminals for bitcoin to be much more difficult to use in-and-of themselves than they actually are. Between bitcoin debit cards and instantly printable QR codes, the end-user payment terminals are not so bad to use especially with the rise of mobile wallets and newfound comfort users have paying with their mobile devices. The issue is mostly one of being confident a transaction will clear so shoppers aren't required to stand around in the grocery store for ten minutes waiting for their transaction to be confirmed but can go home immediately after paying cook dinner the same way they can with cash or card.

Like anything it is a tradeoff between speed and ease of use on the end-user side versus risk a transaction won't clear and the cost that brings to the merchant or payment processor (depending on who owns that risk). A very similar problem to Visa/card networks at the end of the day, but hopefully the bitcoin network will solve it in a way that preserves the low transaction fees and can therefore attract Merchants to adopt it and compete with card payments. Ultimately though the same problems frequently yield similar solutions and transaction settlement is a similar problem in both the bitcoin and card networks when you get down the the technical details and transaction timelines if you want to apply it to in person transactions. I think as risk grows transaction fees will rise (if processor protects merchant) or prices will rise (if merchant takes risk) because it's the only way for merchants to cover their loses from the fraudsters.

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Coinify
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