Digital Finance and Money Collaboration

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Abstract
Our money lives are fundamentally social, but our financial products and services are designed as if they were strictly personal. Mainstream financial service provision is built upon highly individualised ideas about money ownership and money management. Digital technologies, when applied to money, not only perpetuate these assumptions: they exacerbate them, blocking our attempts to engage in collaborative financial behaviours. Inspired by the experiences of our research participants, we present 3 scenarios that illustrate how the design of existing financial services introduces barriers to collaboration around money in multiple contexts. The scenarios highlight the importance of designing financial products and services that enable, rather than prevent, collaborative financial behaviours.

Author Keywords
Digital money; Digital financial services; Financial collaboration.

CCS Concepts
•**Human-centered computing** → **Human computer interaction (HCI);** *Interaction design;*

Introduction
Money is so pervasive that we hardly ever think about it. Where does it come from, who owns it or who bears the

cost of creating and circulating it are questions that never come to mind as we transact. We rarely challenge the approach to money management imposed on us by financial services either. Their design is built upon highly individualised ideas about money ownership and money management. As Pahl observes, *"Financial services and products have always been based on the idea of the individual consumer, rather than the couple or the household"* [4]. Additionally, technologically-mediated forms of money and related services, such as payment cards and digital banking, are *"essentially individualised"* [4]. While cash can be given to someone else or pooled together, handing over our debit card to our son to complete a small contactless payment, or sharing our online banking credentials with our spouse so that they can pay a bill, immediately violate our account terms of service and cancel all our fraud protections. Financial services, as currently designed, not only individualise our money lives: they actually punish our attempts to engage in financial collaboration.

The highly individualised approach to mainstream financial service provision and financial aid in humanitarian contexts, exacerbated by digital technologies, disguises the fundamentally social and collaborative nature of our money lives. In what follows, we present 3 scenarios inspired by our research participants that illustrate some of the many circumstances in which collaboration around money is necessary or could be beneficial. The scenarios also hint at how technology may facilitate such collaborations, rather than hindering them.

Scenario 1: Customised Spending Oversight

Tom, a teacher in his late 50s, has lived with Bipolar Disorder pretty much all his life. He has long periods of time when he is completely OK, but these alternate with periods of euphoria and depression. At "high times", as he calls them, he spends a bit too liberally. When he feels low, he buys things as a way to "cheer himself up". His therapist has explained that these spending patterns are common for people with Bipolar Disorder, but could offer no advice on how to handle them on a day-to-day basis. As a result of his erratic spending behaviour, Tom has suffered financial difficulties in the past and has often accumulated debt. It's not that Tom is irresponsible or "bad with money": the problem is that his mental health condition makes managing money very challenging.

Experience has taught Tom quite a lot about his own behaviour during periods of poor mental health. He knows that the main problems happen during euphoric episodes. He loves travelling, and invariably he starts buying flights "willy nilly". Several online payments per day to an airline or travel website are an almost certain sign that he is struggling with his mental health. If someone he trusts, like his wife or his sister, could be told when such transaction patterns are detected, they could step in to make sure he is OK and help him reign on his euphoric spending. He believes that a text message or a phone call to a designated third party if he uses his card to pay for a flight more than once in a single day would be a great way of supporting him with money management. However, neither his bank nor his credit card provider offer such a service.

Scenario 2: Transacting on Someone's Behalf

Lisa is turning 80 and recently widowed. A homemaker all her life, she found herself having to deal with her financial affairs for the very first time when her husband passed away. Lisa is perfectly capable of managing money when it comes to shopping and other day-to-day things, but paying bills and arranging bank transfers is difficult. Her local branch is far away, dealing with her bank over the phone is hard, and she has never used a computer or a smartphone.

Unable to cope fully on her own, she asked her two sons for help. Since they live far away, they decided to register her mother for online banking. The bank staff in her local branch, who know Lisa and her sons well, facilitated the process, even though they know that such arrangements violate the bank's terms of service and void Lisa's fraud protections. Sadly, they could not think of any other way to facilitate Lisa's sons' assistance to their mother. Lisa's sons have a power of attorney in place, but since her mother is deemed to still have capacity to handle her own affairs, it has not come into force yet. The simplest way to do things remotely and without tiresome phone calls was pretending to be their mum when banking online.

Lisa's youngest son, who does the bulk of the banking for her mum, would like a way to transact online without having full access to her accounts: "I don't need to see all the information, the balances or the transactions. I just need to be able to pay certain companies for services they deliver to mum, and to transfer money between her accounts when she asks me to." Unfortunately, online banking access is individual and binary, cannot be customised in any way, and does not incorporate the concept of multiple users with different read / write permissions common in other computing contexts.

Scenario 3: Collaborative Food Purchases

Aziza is a 24 year old Syrian refugee who is living in an informal settlement in rural Lebanon. Every day her husband walks down to the town square and stands with all the other refugees waiting and hoping that someone looking for manual laborers would drive by and offer them work. Some days he gets work, other days he doesn't. With income being so inconsistent Aziza and her husband are always struggling to buy food for the family and they rely on aid provided by the World Food Programme (WFP).

The WFP gave them a card that they referred to as 'e-voucher' and told them that they can use these cards in some shops to buy food, and only food. The NGO worker that gave them the card also gave them a paper with a number on it and told them that they should not share it with anyone. Aziza and her husband had never used a card like that before, they were really scared that if they make a mistake they won't be able to get food for their family.

So, they went to the nearest shop in their town that was registered with the WFP and told the shop owner that they have an e-voucher but don't know how to use it. The shop owner then asked them to give him their card and PIN number so that he can process the transaction.

Over time, Aziza had become friends with other women living in the refugee settlement. When telling them about her interactions with the shop owner her friend Mona warned her, "yes but be careful and check your receipts because he always takes more money than what you are buying".

Aziza: "I know but what can we do, we can't say anything to him because he lets us use the e-voucher to buy cleaning products and not just food"

Mona: "Yes, I am stuck in the same situation with him as well. I know he is selling us the things at a higher price than other places but we know him and he knows us so he lets us buy what we want with it"

6 months later, Aziza had become good friends with even more of her neighbours. They meet every day and have coffee. They have also begun pooling cash, when they have it available to them, to buy items such as olive oil in bulk and dividing it amongst themselves. That way they can each save a bit of money to spend on other food and/or household items. They even decided to talk to a shop owner,

called Hakim, that they have heard has competitive prices to see if they can purchase items together using their e-vouchers. Based on the discounts and items he has on offer, they worked out that by buying 10 kgs of rice collectively amongst the 10 of them it would work out to be much cheaper than if they each bought a kilogram separately. They also figured that they can send one person with their e-vouchers to do the shopping for all of them that way they can save up on transportation costs. Aziza and Mona also agreed that since Mona's husband is now working and has more cash on hand, Mona will pay using cash for some of the non-food items Aziza needs to buy and Aziza will pay her back by using her e-voucher to pay for some of the food that Mona needs to buy. That way they don't have to ask the shop owner to let them buy non-food items with their e-vouchers.

Based on these conversations Mona went to the shop and told Hakim that her and her friends want to collectively purchase items so that they can benefit from discounts and offers. He was very welcoming of the idea:

Hakim: "Yes, yes I can give you special discounts and gifts like an extra kg of tea and if you want I can have them delivered to you"

Hanan: "That is great, so one of us can come here in a taxi, pay using our e-vouchers and go back in the car with your delivery man?"

Hakim: "E-vouchers? No, no my dear. I can only do all of this if it is using cash. For the e-voucher, I need everyone to bring their e-voucher into the shop in person so that I can verify that it is them. You know I need to do that based on the WFP guidelines. Besides, I scan the items for each person at a time, I am not sure if I can split purchases over several e-vouchers. And also how am I supposed to know that you aren't just using your aid to buy a large amount of rice at a discounted price and that you won't take them home, divide them into smaller bags and sell them at a higher price? The WFP warned me of this."

Discussion

The above scenarios illustrate how our money is only "ours" on the banks' records. In reality, our finances are deeply enmeshed with our social relationships. Research, and the scenarios presented, show that people mostly rely on informal practices in order to enable financial collaboration. These informal practices include sharing bank cards and PINs, and disclosing digital banking security credentials to others. Such behaviours have been often observed in care contexts (e.g. [6]), but happen also between other groups. Sharing passwords in general, including those for personal banking, appears to be common [2, 3]. In a study carried out in Australia, Singh et al. report that *"married and the facto couples share Internet and phone banking passwords because they trust their partner and see all their money as joint, irrespective of the form of the account"* [5]. Alghamdi et al. uncovered that sharing banking credentials happens often within Saudi Arabian family circles [1]. Of their 29 participants, 25 shared their cards and PINs with family members. One of their participants described the practice as *"a way of supporting each other"* and *"a kind of solidarity"*. Singh et al. observe that card and PIN sharing also takes place in remote aboriginal communities in Australia, not just due to difficulties accessing banking services in underserved areas, but also because of cultural norms that establish that *"money is shared with kin"* [5]. In the context of refugees, we find that the sharing of money is considered as a means for working towards collective food security within a community as well as a means of decreasing reliance on gatekeepers such as shop owners.

The above practices reflect the unsuitability of existing financial services when it comes to accommodating collaboration around money. Banks, governments and organisations offer ways of lawfully granting others access to our financial assets, but these are essentially binary. They either hand over full control, as in the case of lasting / enduring power of attorney; or enforce common ownership, as with joint accounts. Such lawful mechanisms are too rigid, ill-suited to the socially situated nature of our financial lives, and do not take into account the cultural, symbolic and communal meanings of money.

Conclusion

The need for flexible, proportionate, practice-sensitive and secure mechanisms for financial collaboration has been recognised for well over a decade, but little has been done to address it. We would like to encourage designers of financial services to incorporate collaboration as a fundamental use case in money management, and to consider how digital technologies could support it rather than hindering it.

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