



Money Whispers: Informality, International Politics, and Immigration in Transnational Finance

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ABSTRACT

While the growth of financial technologies (FinTech) is making the flow of money faster, easier, and more secure, such technologies are often unable to serve many countries due to the global political environment. Despite its severe impact, this issue has remained understudied in the HCI literature. We address this gap by presenting our findings from a three-month-long ethnography with the Iranian community in Toronto, Canada. We present their struggles in transferring money to and from their home country - a process that entails financial loss, fear, uncertainty, and privacy breaches. We also outline the informal workarounds that allow this community to circumvent these challenges, along with the associated hassles. This paper contributes to broadening the scope of FinTech in the HCI literature by connecting it with the politics surrounding transnational transactions. We discuss the design implications of our findings and their contribution to the broader interests of HCI in mobilities and social justice.

CCS CONCEPTS

• **Human-centered computing** → **Empirical studies in HCI**; **Ethnographic studies**.

KEYWORDS

FinTech, Remittance, Money Transfer, Currency Exchange, International Politics, Migration, Informality

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1 INTRODUCTION

Over the last couple of decades, financial technologies (FinTech) have made significant advancements worldwide. In most parts of the Western world, online payment and digital transferring systems have become pervasive, easily accessible, and more secure than ever. Services like PayPal and Western Union have brought about a dramatic change in transnational money transfers by bypassing the traditional multi-layered bureaucratic processes. In the Global South, mobile money transferring systems over ‘feature phones’ have also created new opportunities for marginalized communities to be financially included [63, 97]. Recently, cryptocurrencies and other blockchain-based applications have created opportunities for potential financial systems that are more accountable and trustworthy [42, 69, 119]. While these exciting FinTech applications are shaping our future interactions with money, for a lot of people, especially the ones who have immigrated to the West from the Global South, their services are limited.

Transnational financial services are restricted or blocked for many regions in the world. For example, basic online financial transferring services such as PayPal and Western Union are not available to people from many countries [35, 107, 139]. While some recent digital services like Azimo [1] and Transferwise [2] have eased the access to a few of these excluded countries, many of them remain disconnected. Furthermore, even basic tools such as XE [3] or Google Currency Converter do not accurately work for them. Most of these people need to find alternative informal methods to transfer money to and from their home countries. However, as governments are becoming increasingly active in regulating transnational financial transactions, these informal methods are being deemed “illegal”. Such regulations barely touch privileged people, who are able to easily move money, by means such as, funnelling it into offshore accounts [53, 124]. However, for those at the margins, informal financial spaces are getting increasingly restricted by laws. Nonetheless, these informal methods continue to constitute a large portion of money transfers for most immigrants [48].

With the escalation of international immigration worldwide [27, 49, 91], financial inclusion has become more crucial than ever. In today's world, there are more than 258 million migrants [96], many of whom left their home country because of adverse social and political situations or natural disasters [95, 134]. In most cases, those countries are located in the Global South: countries in the Middle-east, Asia, Africa, or Latin America that are suffering from wars, tyranny, natural disasters, or economic instability. Additionally, a significant number of people are migrating from the Global South to the North for economic [66, 110] or academic purposes [102, 109]. As a result, western countries are hosting a substantial number of immigrants from the Global South, with the number increasing every single day. A significant portion of this immigrant population have migrated from countries that are imposed upon various financial sanctions, due to which the immigrants cannot smoothly transact money using digital technologies. While a growing body of work in HCI has lately started focusing on the life of refugees and migrants, this particular issue has still remained understudied.

To this end, we present the findings of a three-month-long ethnography in Toronto, Canada with the immigrated Iranian community. Based on our findings, we make a three-fold contribution to HCI. First, we present the difficulties faced by the Iranian community living in Toronto in moving money to and from Iran which includes the unavailability of digital services. Second, we report how this community has come up with many creative ways to circumvent these challenges leveraging informality and collaboration, which, however, involve additional hassles. Third, we discuss how HCI design interventions may support this community to overcome some of the challenges that they are facing today. Besides these, we also discuss how these findings depict a residual experience of Iranian people in transnational FinTech and suggest ways for HCI scholarship around FinTech to better engage with international politics.

2 RELATED WORK

2.1 Migration, HCI, and Residual Mobilities

Current HCI research on migration aims to understand the challenges newcomers face and design computational supports accordingly. Topics discussed with new migrants include finance [126], health and well being [22, 23], youth role in family integration [45], collaboration with the host communities [10, 41, 64], preserving memories [116], and information access [37, 62, 115, 117]. Most relevant to this paper is Fisher et al. [45] work on developing Teen Design Days: a scalable and portable methodology used on-site to enable researchers to explore concepts, test ideas, and create designs with migrant youth efficiently in safe settings and in culturally appropriate ways. Other studies [62] explore how immigrants use ICTs to develop social capital to support their adaptation needs. Unfortunately, most studies focus on how newcomers can communicate better with their hosting communities and the researchers, with less emphasis on the long-term settlement in a new country. For the latter, migrant populations need to maintain regular communication to their relatives back in their home countries, often by helping them financially. For a large number of countries around the world, foreign remittance, the money that immigrants send to

their home, is a significant part of their GDP [28]. However, despite their significance, transnational financial transactions have not received enough attention in HCI literature. Further, while most migrations are caused by economic and political pressure, the associated struggles are rarely addressed in public policy [120].

Turning from immediate needs to the long-term integration of immigrant communities requires a critical look into the politics embedded in the infrastructures of a country. We limit our scope to financial inclusion and focus solely on the existing digital infrastructures for FinTech that provide 'ubiquitous' transnational money transferring services. Modern imaginations and implementations of mobilities (e.g., business trip, vacation) differ from the actual experiences of mobilities with respect to displacements, like migration [135]. While a dominant vision of Ubicomp imagines that infrastructures of electricity, internet, language, money, law, etc. will be available throughout a journey [138], this is not true for immigrants from many restricted countries. This leads us to critically examine the relationship between privilege and mobility, with the experience of mobility being dependent on the "degree of control over the flows and movements that shape one's life" [84]. Graham and Marvin advance this argument to show how a person's privilege (with money, power, social capital) helps them remain connected to the network of power in a new location [52]. This reveals the "poetics and politics" [79] of an infrastructure that show how a person's 'distance' from the infrastructure over their social network determines the privilege that they receive from it.

This body of work helps us conceptualize why many immigrants from countries with hostile relationships with the West often struggle to get infrastructural support. Motivated by the concept of "residual" categories [21], Ahmed et al. [9] have termed such movements as 'residual mobilities' and defined it as, "the varied forms of involuntary migration, displacement and disruption that characterize the real-world experience of mobility for a large and growing number of people around the world - both in historically post-colonial contexts like the one studied here, but also marginal locations and experiences in what Suchman [129] has termed the "hyperdeveloped world". Such residual mobilities capture the experiences of people who are not considered when designing infrastructures. In this paper, we look at how the lack of access to existing financial infrastructures results in creative and informal workarounds.

2.2 Finance and HCI

Existing studies related to finance in HCI has largely focused on personal financial management [81, 90], financial education and retirement [32, 54, 55, 108], emotional aspects of money [73], and financial planning tools for personal finance (see [38, 73], for example). Besides looking at the personal aspects of money, scholars have also studied the role of money in inter-personal relationships [24, 76], household finance [36, 137], domestic financial activities, and the ways people track, manage and interact with money and financial instruments [137], suggesting that familial values, relationships and routines should be considered when designing such systems [128]. Furthermore, an emerging body of work has studied cryptocurrencies, and issues of trust in digital financial services [118, 119]. While these studies are largely situated in the West, a strand of research in HCI4D and ICTD (Information and Communication Technology for

Development) lays out the prospects and challenges of design [89], adoption, and actuation of mobile money in developing countries (e.g. security risks [25]) as well as its effectiveness and efficiency, with a goal of increasing financial inclusion [19, 65, 145].

A parallel body of work, based on the materiality of money [86], has been critically analyzing the ‘digitization’ of local finance in developing countries [105]. Scholars have also focused on accessibility [83, 125], rural-urban divide [14], literacy challenge [82] and gender-gaps [16, 33, 47, 126] associated with FinTech. Their findings show that women in a household are often more “financially intimidated” while taking financial decisions than their male counterpart [12, 126]. Another strand of work discusses examples of women’s financial empowerment, in particular through the use of ICTs [126], along with addressing the potential of Fintech to mitigate the gender gap [127]. While this growing body of work is illuminating various important and interesting facets of society’s interactions with money and related digital tools, transnational networks of finance or how financial experiences are impacted by international policies are still understudied.

2.3 Informal Transnational Networks and Finance

HCI Fintech for migration is contingent on understanding how transnational networks around the world are circumventing the closed borders of nation states [44]. Also termed by development scholars as “globalization from below” [85], these networks can be looked at as a grassroots response to globalized capitalism, largely consisting of informal activities [111]. In this paper, we define ‘informal activities’ or “informality” as a set of activities that operate outside formal regulatory frameworks [26, 58, 93]. Literature on informality argues that it manifests itself as a set of flexibility-maximizing strategies that allow actors to circumvent economic, social, and political constraints [29, 121]. However, the importance of social regulation in these spaces also suggests that certain groups and identities could be excluded due to the influence of existing and historical social and power structures [114]. Research on “informality” has consistently tried to detail the experiences of those living at the interstices of the formal economy [31, 75, 77], where they are either ignored or, in an act of empowered agency, purposely seek to avoid the formal systems that are not designed for them and create their own set of informal practices [29, 50].

Informal finance is characterized by unregulated financial instruments, and has coexisted with formal finance across the world for centuries. One such system is Hawala (or Hundi), an ancient remittance system that originated in South Asia [71]. The term ‘Hawala’ loosely translates to “debt transfer” in Arabic, and stands for “trust” in Hindi [112]. Today, this method for transferring money is used globally for legitimate [88] (and illegitimate [20]) remittances both within and across borders. With Hawala, one can transfer money, without actually moving it across borders. For example, one Hawala transaction can be transferring the debt that person A owes to person B, to a third person, C (presumably because person B owes a comparable amount to person C) [112]. Informal systems such as Hawala can provide better conversion rates and faster service than formal money transferring methods (making it both cost-effective and time-saving) [106, 122]. Delivery of the money occurs usually

within a day of the initial payment and is included as part of the service. Lastly, there are no official records or bureaucratic oversight (opening the doors for possible tax evasion and money laundering), with most communications taking place using more informal means such as phone, text, or instant messaging applications [15].

3 BACKGROUND

Our study is conducted against a backdrop of political tension between Iran and the Western world that has resulted in a prolonged embargo over financial transactions with Iran. The economic and political relationships between Iran and Western countries [132], especially the U.S. [17], have been contentious since the Islamic revolution of 1979 [141]. Prior to that, the Shah of Iran maintained close ties to the U.S. [67], but the new regime after the revolution dramatically reversed the pro-American foreign policies that were in place [13]. In the same year, this relationship was further worsened following the diplomatic standoff of 1979 [140], which resulted in significant economic consequences, including billions of dollars of assets being frozen by the U.S. government and the imposition of sanctions that continue to this day [143]. Other major events that contributed to this tension include the Iran-Iraq war in 1980 [142], the formal termination of diplomatic relationships between Iran and the U.S. [87], and the re-imposition of major financial sanctions in 2008 [143]. This was followed by more severe sanctions levied in 2012 on Iran’s central bank by the U.S. and the European Union’s embargo on Iran’s oil [143]. These events led to a dramatic decrease in the value of Iranian Rial (IRR) against the U.S. Dollar (USD) and other major currencies. Followed by the U.S. withdrawal from the JCPOA (Joint Comprehensive Plan of Action) or the “Iran deal” in May 2018 [61], the value of IRR severely plummeted, reaching its lowest value in October 2018. The magnitude of the economic effects of the sanctions can be seen in the 981% increase in the rate of USD against IRR from 2009 to 2019 [100]. Furthermore, because of the sanctions, there are no digital money transferring services that transact money to and from Iran [133]. As a result, Iranians need to depend on informal money transaction methods discussed in the rest of this paper.

4 METHODS

We conducted a three-month-long ethnography in the Greater Toronto Area. Using a combination of semi-structured interviews, unstructured in-situ interviews, as well as participant observations, we delved into the financial experiences of the Iranian community in Toronto. The primary researcher is an Iranian, native Farsi speaker and has prior experience dealing with currency exchange. Being from the subject community, she was also aware of the customs and social protocols in the shops and ensured that she introduced herself and the research project to all actors when in the field. The data was collected with the consent of all parties present in the field, including customers and shopkeepers keeping in mind their comfort. We excluded any observations which might compromise any of the participants - this was done both through a discussion among the members of the research team and several discussions with the community. Given the vulnerable nature of the community, we have chosen not to disclose sensitive themes in the paper but have taken due precautions that the excluded data does not

affect our findings. The full research protocol was examined and approved by the ethics review board of the authors' institution.

We interviewed 15 exchange shop owners and employees as well as 30 customers whom we recruited from the exchange shops. The number of participants was not predetermined but rather dictated by theoretical saturation. We also conducted in-depth semi-structured interviews with 14 Iranians - 6 women and 8 men. In our interviews, we asked questions regarding participants' overall experiences in using the existing financial systems to send and receive money to and from Iran. We conducted interviews until data saturation was achieved [51]. Our participants' ages varied between 24-57 and represented a diverse set of professions. We initially recruited through posting on Iranian-based social media groups on Telegram and Facebook as well as by posting flyers in neighborhoods where Iranian people live. We then recruited through snowball sampling where we asked our participants to refer us to other qualified individuals. All interviews were carried out in Farsi, the native language of all our participants. We further conducted ethnographic observations and in-situ interviews in the currency exchange shops. The informal and sensitive nature of these financial activities meant that participants were often reticent to talk. When granted consent, we took photographs and detailed notes during our observations. All the interviews were transcribed and translated into English, with the data analyzed through an iterative and deductive coding process. Our analyzed data and notes cover more than 200 pages and we recorded more than 180 hours in interviews and on-site.

As is common in focused ethnographic studies [60], we started with broad research questions about the experiences of the Iranian immigrant community with financial transactions. The primary questions focused on the shared practices in the community, while the secondary questions focused on the factors that facilitate, constrain, or sustain observed behaviors. The coding was an iterative, cyclic, and self-reflective process. It involved both deductive and inductive approaches, where the former produced a set of a-priori codes while the latter produced the final set of themes that we present in the findings section.

4.1 Field Site

Most of the Iranian exchange shops are located along one of the major streets in Toronto. In Farsi, currency exchange shops are called "Sarraf" and the vendor who does the exchange is called a "Sarraf". However, Sarrafs are more than just currency exchange providers as most focus on money transfers as well. We started our ethnographic work from a busy shopping plaza which houses more than 20 Iranian currency exchange shops in that neighborhood alone, and later expanded our research to exchange shops in other areas.

We observed that most of the transactions performed at these shops involve Iranian citizens going to the shops, negotiating the exchange rate between IRR and Canadian Dollar (CAD) and then, having their Iranian debit card swiped on an Iranian Point of Sale (POS) device, owned by the shops. The POS devices are behind thick, bullet-proof glass that separated the customer and Sarrafs. Some of the POS devices are wired and need to be plugged in and connected to internet using a LAN cable so they can't be moved to the other side of the glass. After the receipt comes out of the

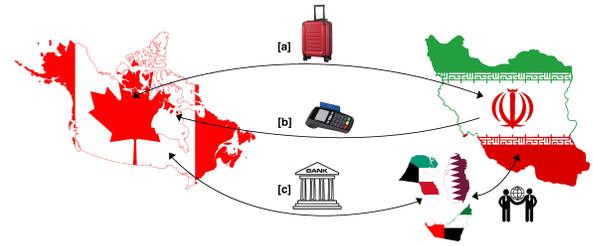


Figure 1: Channels for transferring money between Iran and Canada. From top to bottom: a) carrying cash on body or in a suitcase, b) using POS devices in Iranian Sarrafs, c) using third-party banks and businesses in the Arab states of the Persian Gulf.

POS device, indicating that the transaction was successful and the money was transferred to the vendor's bank account in Iran, the employees at the exchange shop pay the equivalent amount of cash in CAD to the customer. There is usually no formal proof of purchase for these transactions except for the small receipts that are generated by the POS devices, which are written in Farsi. We also noticed that these shops do not start selling until around 11 AM when the stable exchange rate of IRR to USD is announced from the Grand "Bazaar" of Tehran the day before¹. A considerable portion of financial transactions to and from Iran happen at these currency exchange shops. However, the Iranian exchange market in Toronto is predominantly male-dominated and restricted in access - having connections is important in being able to get quality service. This made the data collection process more difficult for our primary researcher, who is female.

5 INFORMAL WORKAROUNDS

Iranian immigrants in Canada have come up with creative informal workarounds to fulfill their money transferring needs. Figure 1 demonstrates a summary of the methods used to transfer money between Iran and Canada.

5.1 Money Brokers (Sarrafis)

We found that a large proportion of Iranian immigrants' funds are transferred through Sarrafis. Even though running a currency exchange shop is a formal business, due to the affiliations of some Sarrafs with other informal transnational services, many of their activities are informal. The Sarrafs help transfer money in the following ways:

5.1.1 POS Devices. All of the exchange shops that we visited had at least one POS device [59]; this device had been brought from Iran and installed in their shops. If a transaction is successful, a receipt, written in Farsi, indicating the name of the vendor, date and amount of transaction along with other information, is printed by the device. We noticed on the receipts that most of the POS devices do not belong to Sarrafs in Iran and are actually associated with some other businesses. This corresponds to literature that discuss how informal financial transactions are often carried out within

¹Since USD is the world's premier reserve currency, the rates of all other currencies are calculated based on USD.

other legitimate businesses such as import/export, jewelry, foreign exchange, and rugs/carpets vendors [18, 34]. The government of Iran has banned the use of Iranian POS devices outside of Iran; in response, some Sarrafis use Virtual Private Networks (VPN)s to change their origin of connection to a location in Iran. Many Sarrafis have stopped using POS devices and instead ask their customers to deposit the money in IRR to their Iranian bank account through other means.

5.1.2 Cheques and Drafts. Though cheques and drafts² are considered to be formal ways of transferring money, in the context of Iranian Sarrafis, they are used as part of an informal process of customers sending the money in cash or to the Sarrafis' Iranian bank accounts. Cheques and drafts are indicative of the legitimacy of the source of money, hence, the customers feel more relaxed about the possibility of being questioned by the government. Some Sarrafis provide cheques and drafts to their customers, but we found that they prefer to avoid this method as much as possible (partly to not leave any paper trails), and they try to convince the customers to opt for cash as much as possible. We noticed that drafts are only issued for large sums with higher exchange rates compared to cash-based methods. Further, issuing drafts costs more money and time than using instantaneous systems.

5.1.3 Indirect wire transfers. The sanctions targeting the financial and banking systems of Iran have resulted in an inability to directly use wire transferring systems with western countries. However, this service is available through some banks or businesses in third-party countries such as the Arab states of the Persian gulf (e.g. UAE), therefore some Sarrafis provide wire transfers via banks or businesses located in these countries. Since this is the most formal method of transferring money, it is considered to be the most expensive and least time-efficient method among all the available services due to the additional required procedures involved. This method is mostly used for large sums that are not needed immediately. It is worth mentioning that most of our participants had never used this method to transfer their funds.

5.2 Cash on body or in Suitcase

Many Iranians carry cash while traveling, as a means to transfer their funds to and from Iran. Although bringing cash to a foreign country in a suitcase (or in any other carrier) is not unique to Iranian immigrants, it is one of their main methods that they rely on to bring their cash to Canada. There are no restrictions on the amount of money that one can bring into or take out of Canada [104]. However, one must report monetary amounts equal to or greater than 10,000 CAD or its equivalent in a foreign currency to the Canada Border Services Agency [103]. All of our participants were careful to bring less than 10,000 CAD due to the fear of being interrogated through the formal declaration process. Others feared that they might lose their money or be subject to theft if they carried large amounts of cash. As a result, they tended to stay within the limits and bring the rest of their funds gradually through other money transferring methods.

²A bank draft is “a payment on behalf of a payer that is guaranteed by the issuing bank and ensures the payee a secure form of payment”[72]



Figure 2: A self-sewn hidden pocket in the pants of one of our participants to safely carry cash while they travel.

Our participants employed different creative ways to protect their cash against theft and misplacement during their travel time to Canada. Examples of such methods include wearing neck wallets that can be hidden under their t-shirts, distributing the cash in their suitcase, backpacks, and fanny packs, among other creative ways. As the following example and figure 2 show, one participant took advantage of his mother's sewing skills to hide his money.

“It was my first time leaving Iran to live in a new country. I was young and my family feared that I might lose all of our hard-earned money. My mom sewed a hidden pocket in my jeans that I was going to wear on the airplane to make sure that it's not going to be stolen while I am asleep.”

(P2, Male, Researcher, 30s)

Some of our participants believed that bringing cash in suitcases from their visits to Iran was the cheapest and most convenient way to bring their funds to Canada, despite the risks involved as well as the limitations on the amount of money one can take out of or bring into each country.

Carrying cash to Iran was also common among our participants. For example, one of our participants who runs a business in Iran, carried cash from Canada to Iran with him to avoid hassles:

“To pay my employees' salary in Iran, I take cash with myself from Canada. Cash is trace-less and this works for me. Luckily, there's no limit on that so I take as much as possible ... Although Sarrafis will do this for you too, I find this method cheaper and faster.”

(P10, Male, Engineer, 30s)

When informed by the interviewer that such limits exist, he was surprised and said he would never try this method again.

6 RESIDUAL EXPERIENCES

6.1 Financial Loss

6.1.1 Fluctuations, Sarrafis, and Hope. Our participants reported that they often lose money due to the fluctuation of exchange

rates of IRR. The currency shock in 2018 saw the price of 1 USD rise up to almost 190,000 IRR in the free market [43]. This was accompanied by major fluctuations in the currency rates, leading to a lot of uncertainty among our participants. After the drastic decrease in the value of IRR, our participants attempted to save the value of their money by purchasing foreign currencies that are more stable than IRR. [94]. The increasing price of USD meant that people who had converted their money after the falling value in IRR had significantly less assets compared to those who converted their money prior.

In the face of uncertainty due to extreme fluctuations, many exchange shops stopped selling dollars to customers. With the price of USD (and CAD accordingly) on an upward trend, the shops reasoned that selling at a later stage would allow them to reap more profits. Our participants reported that this did not hold for friends, family, and loyal customers of these Sarrafis. As we see in the quote below, these fluctuations were a significant cause of tension for customers looking to exchange their currency:

“When the prices were going up by the minute, you could feel the tension in the Sarrafis and the way they dealt with customers. I saw people getting into fights at the shops. I remember in one case one Sarraf told a customer that the selling price is 150,000 IRR, the customer went out to ask other Sarrafis’ rate. When he came back, that Sarraf told him: “that price was for 15 minutes ago. My price is 160,000 IRR now!”

(P11, Male, Data analyst, 30s)

In reaction to this situation, our participants responded in two different ways: the first was to wait it out and withhold purchasing foreign currency if they didn't have urgent needs, and the second was to conform to the higher rates of the Sarrafis. As we see in the following quote, one of our participants ended up transferring her money through wire transfer via a third country out of despair. This method was relatively hassle-free but cost her extra time and money:

“I needed money for my tuition at the time when the fluctuations were at their peak. Sarrafis in Toronto didn't sell (dollars) to me, but my father found a Sarraf in Tehran through one of his friends who would wire transfer the money via a bank in Kuwait. It was more expensive and time-consuming than getting cash from the Sarrafis in Toronto by swiping my debit card, but I didn't have any other choice. I'm an international student and my tuition is high (almost 50,000 CAD). For every dollar, I remember we paid 1000 IRR extra. We almost paid 50 million IRR (500 CAD) more than what we would have paid if I was able to get cash from the Sarrafis. On the other hand, this way I didn't have to go all the way to uptown, waste a whole day, and go through the stress of handling cash. It was a blessing and a curse.”

(P6, Female, Student, 20s)

6.1.2 Transportation and Insecurity. The formal methods of transferring money (such as drafts, wire transfers, etc.) are difficult for Iranians due to various reasons such as higher rates and costs of

transactions, lack of direct availability, and the hassle of finding trustworthy agents (who require the customers to transfer high amounts of money), etc. Therefore, they generally tend to use more cash-based methods such as bringing physical cash from Iran or using Iranian debit cards at Sarrafis in exchange for CAD. Since the Sarrafis usually tend to give cash to their customers rather than drafts, one challenge is to carry the cash and safely deposit it at an ATM or a bank branch. One of our participants said:

“My friend purchased \$9000 CAD from a Sarrafi. He put the money in the glove compartment of his car and stopped to buy coffee. When he got back, he realized that the cash is gone! He thinks someone might have followed him from the Sarrafi. He reported this to the police but he never got his money back.”

(P8, Male, Salesman, 40s)

One of our participants noted the risk involved with carrying money in pocket or suitcase when travelling:

“I intended to bring 10,000 CAD to Canada and I didn't want to put all of my eggs in one basket, so I distributed the cash in different places. I put most of it in my backpack, part of it in my suitcase, and carried the rest in my pocket. I figured since I have my immigration documents, and other valuable items in my backpack, I will be watching it closely. When I arrived in Canada, I realized that all the cash in my backpack is gone but all my other belongings were there. Someone must have seen the envelope and took it from my backpack while I was asleep on the airplane.”

(P12, Male, Graduate Student, 20s)

6.1.3 Third Parties and Double-Charging. As a result of sanctions, Iranians are no longer allowed to trade in USD. To comply with the U.S. sanctions, Canadian banks have previously closed USD accounts of Iranian citizens (including Iranian-Canadian dual citizens) [98, 99]. Due to the global prevalence of USD and Euros, purchasing these currencies in Iran is far more convenient than purchasing other currencies, such as CAD, so most of our participants had exchanged their money to USD, prior to coming to Canada. Following this, most of our participants had to convert their USD to other currencies, such as Euros or CAD, because they could not store their money in USD in Canadian banks. The fluctuating and declining rates of the IRR also made it unappealing to convert their funds back to IRR. Depending on the exchange rate between USD and CAD to other currencies, and considering the possible fall of other currencies against USD over longer periods, this meant a potential loss in the value of their money.

“My husband and I brought USD in cash from Iran, but we didn't want to open a USD bank account here since my friends' USD accounts had been closed before. We had to convert our money to CAD to deposit it in a bank. The day after we exchanged our money, the exchange rate from USD to CAD went up and we lost almost \$200.”

(P1, Female, Engineer, 20s)

In the midst of fluctuations, it is often hard to find a stable exchange rate. The following quote from one of the Sarrafs outlines the various factors considered in determining the informal exchange rate given to customers:

“We get the exchange rate of USD to IRR from the previous day’s free market in Iran (this factors in all the components such as the exchange rate between IRR and United Arab Emirates Dirham, price of oil, inflation, fiscal and monetary policies of Iran, etc) and then apply the global exchange rate between USD and CAD after that. This is the price that we tell customers when they ask to buy CAD with IRR.”

(Male, Sarraf, 50s)

Considering that all the currency exchange shops use the “selling rate” (which is higher than the “buying rate”, the rate they use to buy currency from the customers) to calculate the ultimate rate from IRR to other currencies, exchanging IRR to currencies other than USD is more expensive for Iranians compared to citizens of other countries. In other words, Iranians lose more money compared to people of other nationalities who only have to account for the exchange rate between their currency and USD.

6.2 Trust, Uncertainty, and Privacy

6.2.1 Uncertainty about rate and availability. After the withdrawal of the U.S. from the JCPOA in 2018, the exchange rate between USD to IRR ascended rapidly. Due to these considerable fluctuations in the exchange rate and the sudden plummet of the value of the Rial, many Iranians rushed to exchange their IRR to other currencies [40, 94]. Following the re-imposition of the sanctions, many Iranians are anxious about an uncertain future where their net worth continues to drop on a daily basis:

“I run a business in Iran, and I check the exchange rates every day to see whether my business will go out of work. There are a couple of websites that I trust and check. You can see them in the topmost frequently visited websites of my browser. I think they show the real rate, plus-minus a small, insignificant amount.”

(P8, Male, Salesman, 40s)

Money transferring methods that involve trusting another party add another layer of stress and uncertainty. As we see in the following quote, the lack of paper-trail in existing informal systems hinders the ability of customers to approach officials and subsequently track down violators:

“I’ve worked with most of the Sarrafs in that area. One of the very well-known ones took 6 months to give me my money. I had to call them every day to follow-up, and they made excuses each time. They told me that after I paid them in IRR, the rate had gone up, and they didn’t have enough money to pay me in CAD due to their loss! After learning about their untrustworthiness, I tried to do business with other Sarrafs, but sooner or later, they all gave me a reason not to trust them. Finally, one of them didn’t pay the 90,000 CAD he owed me. He closed his shop and ran away. I went to the police, but all I had were a bunch of receipts, all written in Farsi,

that came out of POS devices. The name of the shops on the receipts indicated that the POS devices belonged to random shops in Iran that were not even Sarrafs! My money is gone, and I have no proof to get it back.”

(P8, Male, Salesman, 40s)

As the exchange rate fluctuated by the hour (or often by the minute) during peak days, customers noted that the Sarrafs would often not honor their promised prices but would increase them instead.

“Uncertainty about the price and availability of dollar was the biggest challenge for me. There were many times when I needed money, and the Sarrafs didn’t sell to me because of the fluctuations. I followed the news every day to be able to predict when cash is going to become unavailable.”

(P11, Male, Data analyst, 30s)

6.2.2 Fear of the Government and Tax Revenue Agency. Almost all the participants noted their fear of having their assets frozen if the government of Canada asks them for proof of how they received their money. Many Iranians had stored USD in cash at their home in Iran and brought them to Canada with insufficient proof about their origin (where and how purchased). This fear is exacerbated in participants who had transactions that were more frequent and in large amounts.

“My friend once had a deposit of 15,000 CAD to his bank account. The bank froze his account for further investigations until the source of his money was revealed. He didn’t have access to his bank account for 6 months and had to live off the cash that he borrowed from his friends.”

(P8, Male, Salesman, 40s)

Further, participants feared ramifications from their actions back in Iran, as we see in the following quote:

“I don’t trust these POS devices. I’m skeptical about their legitimacy, yet I have to use them to get money. I’m afraid that in the future, the government of Iran might press charges on me for using my card on illegitimate machines outside of Iran. People say that they are not legal to use outside of Iran, but the Sarrafs in Canada are still using them ...”

(P11, Male, Data analyst, 30s)

6.2.3 Privacy. The POS devices are not directly accessible to the customers due to the thick glass between them and the Sarraf; during the transaction, the Sarraf asks for the customer’s debit card and the pin number so they can enter the agreed upon amount in IRR and withdraw the money out of their account. Usually in these cases, the customer has to say their pin number out loud. This was not perceived to be safe, especially if there were other customers or employees in their vicinity. In the quote below, we see how one of our participants attempted to negotiate this privacy concern:

“Sometimes there are other customers at the Sarrafi, too; I don’t want other people to know my Iranian debit card’s PIN code. It’s not safe. So whenever a Sarrafi employee asks for my PIN, I write it down on a small

piece of paper and slide it to the other side of the thick glass. After the transaction, I ask them to destroy that piece of paper.”
(P11, Male, Data analyst, 30s)

However, as the primary researcher has personally experienced, this act of getting a client’s card and asking for the pin is common in Iran. Recently in Iran, some new POS systems come with two devices, one on the client side and one for the merchant so that the privacy of customers is maintained. Some Sarrafis have begun to respond to the privacy concerns of their customers by installing the new two-device POS devices. It is worthwhile mentioning that the tap system does not work with the current models of Iranian POS devices, and the client has to insert or swipe their debit card into the machines physically.

6.3 Hacking the system

The creative solutions to circumvent the hurdles in transferring money are not always straightforward and often involve convoluted steps.

6.3.1 The Aftermath: Breaking Down the Money. All of our participants who transferred large amounts of money told us that, based on their experiences, they know that banks in Canada are obliged to report transactions of more than a certain amount to the Canada Revenue Agency (CRA). Such transactions are monitored and might be subject to audition for anti-money laundering purposes. During the auditing period, the money is withheld by the bank until the source of the money is determined. Some of our participants mentioned that deposit amounts more than 7,000 CAD are subject to audit whereas others believed this number is 10,000 CAD. None of our participants had their money frozen by banks but they had heard stories from friends and family members whom had experienced this before. Our participants mentioned that to be on the safe side, if they were to deposit large amounts of cash, they would do so in smaller chunks.

To comply with anti-money laundering policies, most countries have set a limit for electronic transfers within their country. This holds true for Canada, as well as Iran. In Canada, there is usually a limit of 3,000 CAD per day (although this could be increased) that can be transferred using the internal Interac e-Transfer system without the need to visit a branch. In Iran, this limit per debit card is 30 million IRR (roughly 245 USD). Thus, in order to transfer more than these amounts to the Sarraf’s Iranian bank account (if done through online banking, not the POS devices), or informal transfers with their friends, our participants reported that they have to complete such transactions in installments over multiple days. In such instances, the issue of price fluctuation caused troubles with some of the Sarrafis, reneging on handshake deals with respect to lower prices. Alternatively, the customer would have to physically go to a branch to make the transaction in one installment. Despite the risks involved with storing large amounts of cash at home, or in safe boxes at banks (due to the lack of supporting documents that establish a clear money trail), one participant noted that they engaged in such practices to avoid government suspicion regarding their income.

6.3.2 Timezone differences: Before and after 3:30 PM. There is a time difference of 8.5 hours between Tehran and Toronto. Therefore, after 3:30 PM in Toronto, any transaction is considered to be done in a new trading day. As the transaction withdrawal limit using a POS device is 500 million IRR per day per debit card, if a person uses their debit card before and after 3:30 PM Toronto time, they can withdraw 1000 million IRR in a day in Toronto.

“I had heard that the government of Iran is going to impose a withdrawal limit per person and debit card, so I made my large transactions before that. Now, if I need more than 10,000 CAD in a day, I use my family members’ Iranian debit card.”
(P8, Male, Salesman, 40s)

However, this hack is difficult for Iranians who have full-time jobs since they would need to take a break in the middle of a workday to go to a different part of the city for this:

“I have to leave my office in downtown at around noon, take the subway all the way to uptown, get the money, wait until after 3:30, get more money, deposit it in my bank account, and come back to the office. By the time I’m back, the day is almost over. I’m a busy man and this is a lot of time to waste in a day just to get my money!”
(P5, Male, Professor, 40s)

In our most recent visits to the site, we found out that Sarrafis do not sell after 3:30 PM anymore. When we asked, the Sarrafis explained that it is because some of their POS devices have been “flagged” by the central bank of Iran and have stopped working since then. They also mentioned that the central bank got suspicious of the abnormally large amounts of transactions that were recorded by these devices after midnight in Iran.

6.3.3 Multiple Debit Cards. In late 2018, in response to the significant amount of money flowing out of Iran due to repeated transactions made by Iranians expatriates, the government of Iran imposed a limit on the amount of money each person and each Iranian debit card can withdraw. This limit is 500 million IRR (around 4040 USD at the time of writing this paper) per debit card per day. Also, each individual can only withdraw 1000 million IRR (around 8080 USD at the time of writing this paper) per day, regardless of the number of debit cards that they hold as the Iranian government keeps track of individual’s bank accounts across all banks in Iran.

Depending on the amount of money needed, Iranian customers used a combination of different workarounds to withdraw money from their bank accounts in Iran. In some cases, customers would bring their family or friends’ debit cards in order to be able to make multiple withdrawal transactions. For example, by borrowing a debit card from a family member and using the multiple trading day technique, one can withdraw up to 4,000 million IRR (around 32,000 USD). Though this is an unlikely situation for day to day purposes, it can be a reasonable amount for a newcomer, at least for the first few months of transferring their assets from back home.

6.4 Collaborative Creativity

All the informal workarounds for moving money mentioned in this paper are a result of actors collaborating across nations. For

example, the use of the POS devices is possible only because of the Sarrafs in Canada and local contacts back in Iran working together to maintain and support this financial service. Similar collaboration is required when trading with exchange shops in third-party countries.

6.4.1 Social Ties. We found that having connections and strong social ties within the financial sector community has a direct impact on receiving better services in terms of rate, speed, reliability and availability. In the example below, our participant claims that their connections with a particular Sarrafi and their loyalty, guarantees the availability of currency for them.

"I have been working with this Sarrafi for over a year now. They know me when I enter their shop. They always sell to me, even when other shops stop selling due to price fluctuations. I'm always sure that I can get buy from them."

(P5, Male, Professor, 40s)

This participant claims that referrals and even indirect connections have helped them get better rates as well as faster service with less hassles:

"I never go to a Sarrafi. My father's friend is a regular customer of this Sarrafi. I just call them and ask the rate (they usually give me a better price than other Sarrafs), my father deposits the money to their bank account in Iran, and I see CAD in my bank account in a day!"

(P7, Female, Engineer, 20s)

We also see how informal household relationships shape the power dynamics with respect to the financial decisions of female participants, especially those who were married. Invariably, the men took the lead in managing financial affairs:

"I'm sorry I don't know much about transferring money. I have never been to a Sarrafi. My husband takes care of financial matters like this. I can ask him about his experience for you."

(P1, Female, Engineer, 20s)

Almost all of our female participants were less knowledgeable about financial matters and available financial services compared to male participants. Despite our studied population being relatively educated and well-off, we still found that women were more likely to have less financial knowledge.

6.4.2 Power of Negotiation. Negotiations of value are an integral part of informal markets [30], where extended conversations between market actors help reduce information asymmetries and uncertainty. This holds true for informal exchange communities as well, where information seeking about exchange rates is transformed into a social activity. This is a complex practice, shaped by social relations, the amount of transactions, and method of currency exchange. For example, if a customer chooses to take cash over a draft, they would get better deals.

"I usually negotiate with the Sarrafs. I check the rates of a couple of shops before deciding on which shop to buy from; then I tell them that I have a better rate from another shop. Usually, they offer me a lower rate to

match their rivals!"

(P10, Co-Founder of a startup, 30s)

As the above quote shows, the many Sarrafs competing with each other drive prices down and allow experienced buyers to get a competitive price.

6.4.3 Telegram, Information, and channels. We found that our participants depend heavily on social media to check the rates and availability of foreign currency. The majority of them were active members of related Facebook groups as well as channels in Telegram, the most popular instant messaging application in Iran.

"There are a lot of such channels. I can add you to the ones that I subscribe to, and you can find many other channels advertised in them as well as other in-demand Iranian channels."

(P2, Researcher, 30s)

Despite Telegram being blocked in 2018 by the government of Iran, it remains the most popular instant messaging application for Iranians inside [68] and outside [101] of the country. Facebook, on the other hand, has been blocked in Iran for a longer period of time and is not as popular as Telegram within Iranians living in Iran [74] yet due to its global popularity, it is frequently used by the Iranians outside of Iran. Iranian immigrants, especially newcomers in Canada, rely heavily on Telegram and Facebook, particularly during their initial settlement phase. There are various Iranian Telegram channels and Facebook groups in Farsi on general information and laws about immigrating to Canada, finding housing (to rent or buy), building a good credit history, buying cars and how insurance works in Canada, etc. People further use these mediums to discuss where to find different quality services such as Sarrafs, or Iranian supermarkets. All issues about settling in a new country are discussed through groups and channels in Telegram and Facebook.

However, we also noticed that Telegram channels and Facebook groups were primary sources of immigration and settlement related information, mostly for newcomers or those who were not very tech-savvy. On the other hand, more experienced participants reported that they rely on websites more than social media when it comes to financial matters.

"I only trust the official websites of the Sarrafs in Canada and the Union of Sarrafs in Iran. They give me a reasonable estimate at every hour."

(P8, Male, Salesman, 40s)

7 DISCUSSION AND CONCLUSION

In the sections above, we have presented how the Iranian community living in Toronto often struggles to make financial transactions to and from Iran because of the financial sanctions imposed on their country. We have explained how those sanctions have meant that many digital financial technologies are unable to serve Iranian people. Our findings show how this resulted in a loss of money and time, fear, uncertainty, and other various hassles. In the face of such adversity, the Iranian immigrant community in Toronto has found ways to leverage existing transnational networks to circumvent the infrastructural challenges that impede their economic security. However, these networks are not unique to just this community. Immigrants around the Global North, especially those from low and

middle-income countries, have similar experiences, confronting financial loss, uncertainty, and fear with respect to their basic financial needs. Setting up life in a new country is often contingent on the ability to transfer assets; however, many find themselves stymied by infrastructural marginalization shaped by global politics, resulting in a lack of access to digital financial services that most in the Global North take for granted. Our findings, hence, depict a story of marginalization through digital infrastructures for many such immigrants and generate several important lessons for HCI researchers.

7.1 HCI and Informality

In this paper, we bring informality to the attention of Fintech HCI research. We argue that studying informality will allow designers to conceptualize the day-to-day financial activities that people in marginalized groups engage in, but which are not taken into account by formal economic analysis. Furthermore, in times of shock or when formal systems fail or exclude particular groups of people, informal systems are what most communities fall back upon [105]. These informal systems - historical and resilient - are key to understanding the design of financial technologies that are more inclusive. We stress that informal here is not in direct opposition to existing formal regulations - in doing so, we eschew simplistic binaries of formal/informal and instead argue for a postcolonial perspective to informality [136]. The choice between informal and formal financial services invariably boils down to a trade-off between flexibility and accountability. With respect to the Sarrafs, we see how currency exchange rates are flexible and open to negotiations, allowing customers to get the best possible real-time exchange rates. For example, informal services often include transactions on holidays with close to zero waiting time. Further, there is little need for bureaucratic artefacts such as ID cards or even local bank accounts. Thus, they open up financial spaces to people who might otherwise be left out. On the flip side, these services have little or no paper trails. The absence of formal receipts and bureaucratic oversight also are not without their associated risks; these risks are amplified in the absence of existing social relationships - a situation that is not uncommon with new immigrants [78]. We do not seek to view these informal systems as an exotic "other", nor do we seek to romanticize them. Rather these systems are a manifestation of the social, political, and material realities of everyday life as immigrants. The informal workarounds that we describe in this paper are communities simply finding ways to get around the structural constraints that impede their financial freedom.

Our paper further demonstrates how financial activities are shaped by informal household relationships: women often face more difficulties than men even within a marginalized group. Our data reveals two kinds of gender-based differences in the Iranian immigrant community. First, many women show a lack of interest and often hold a limited stake in the financial decision making of their household. This is often a reflection of the Iranian culture where men usually handle the financial matters of the family and constitutes a significant challenge towards women's financial inclusion. Second, the financial exchange shops that we studied are male dominated and there were few female Sarrafs there. As a result, it is often uncomfortable for a woman to go there and get

essential money transferring and exchange services. Many public informal markets in the Global South also suffer from this problem, and we identify this as a noteworthy challenge towards women's participation in FinTech. We call for attention of HCI researchers and practitioners to look into these issues to make future FinTech environments more inclusive.

7.2 Transnational HCI and Finance

This paper broadens the scope of FinTech HCI to international politics, which we argue, is immensely important in today's globalized world. While money is personal and private, it is also public and political in nature. Ranging from the acceptance and value of currency to their smoothness in their flow - a transnational perspective offers a wide range of topics and lenses to conceptualize various challenges and opportunities around financial technologies. We argue that these aspects of global politics also impact how people, even in their very personal sphere, deal with their personal finance. Hence, understanding human interaction with FinTech needs to go beyond an individual's personal, familial, and cultural values and should also tie to the broader contemporary global politics that essentially shape the economic atmosphere of the world. Transnational HCI has already begun to analyze how people, knowledge, and goods move across differing spatial and political contexts, with studies [123, 144] stressing that, as designers, we need to be aware of how people's lived experiences are now enmeshed in global networks. This paper adds to this literature by making visible how informal processes straddle political borders and bridge immigrants with their home countries. The study of transnational informality highlights the constant movement of resources and people. Further, the fluid dynamism of informal financial systems such as Hawala emerges from the same forces of globalization that seek to regulate it.

Our research also contributes to the emerging body of work within HCI around refugees and immigrants, politics of residuality, and the community practice of making (see [9, 46, 64, 92, 130, 131], for example). The existing body of work is predominantly focused on the immediate needs of the migrants including food, medicine, shelter, and employment. While these are important, these communities also face challenges while settling down for a long-term in a foreign land. Addressing those challenges will require us to deeply examine the factors shaping inclusion within the service infrastructures of a country, many of which are not favorable for immigrants. While our study reveals the struggles of Iranian community with Canada's financial infrastructure, there are many other struggles related to language, education, and employment that also need to be examined thoroughly to identify and reduce the impact of such exclusions. Our study also contributes to the growing body of work around local resistance, vernacular art, craft, and collaboration within marginalized communities (see [8, 57, 70, 113], for example). The 'hacking' and 'social engineering' mechanisms that we described in this paper demonstrate how people come up with 'innovations' in times of need through shared knowledge and collaboration and 'make do' things. Such innovation and creativity often fall outside the interest of Western design and formal innovative processes of making [11]. We argue that understanding and supporting such grassroots-level innovative initiatives can lead the

discipline towards a more sustainable form of making. This paper also joins the growing body of HCI work in privacy and security outside the mainstream western paradigm (see [4–7, 56], for example). We argue that focusing on the situated practices of ‘secret’ activities will enrich HCI with more supportive technologies that will assist many marginalized groups.

7.3 Design Implications

Finally, we turn to the design implications of our study. Our study shows that the Iranian community in Toronto is able to come up with many innovative strategies to circumvent existing infrastructural challenges; however, these strategies do not come without obstacles. Many of them remain in fear of theft because the Sarrafis primarily deal with cash. Additionally, there is always an overarching fear of having their assets frozen by Canadian law-enforcement that often stems from their lack of knowledge about the local laws. We believe that HCI research can support this community by designing technologies with them.

Designing for informality involves a deep engagement with the community and leveraging existing informal relationships and social mechanisms that can help prevent possible misuse (for example, money laundering). These closely-knit social networks help in creating the rules, norms, and incentives [80] that can be implemented using decentralized technical architectures such as blockchains [39] to design community-driven financial transaction methods. For example, newcomers looking to find the appropriate social support to get a fair price in the informal market, could be served through an online volunteer community closely connected to the local Sarrafis. A potential solution for accountable cross-border transfers, that the researchers are working on, is the implementation of a community-regulated digital financial system. This system will work with existing offline transnational communities to match pairs of people looking to transfer money, so that people can transfer within their own countries, rather than actually moving it across borders. We hope to create trust in such a system through the social regulation that is inherent in closely-knit communities. Thus, we see a potential for many HCI innovative design interventions in this area that can serve a large number of immigrants in the West to send and receive money to and from their home countries.

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