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Tech Reluctance: Fostering Empathy for Canadians Facing Challenges with Digital Systems

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Abstract

Designing inclusive and user-friendly digital payment systems is crucial to eliminate barriers faced by users. This research focuses on fostering empathy for and identifying the needs of users who exhibit behaviours that indicate they encounter accessibility or usability barriers in digital systems. Specifically, we examine two types of users based on two common behaviours: users who rely on others to perform tasks and those who avoid interacting with technology.

The Bank of Canada partnered with the Inclusive Design Research Centre at OCAD University to gain a deeper understanding of these groups. Co-design sessions with end users were used to identify scenarios when cooperative efforts are needed, system features that facilitate supported banking and pain points customers and their support people encounter.

The findings show that individuals in the two groups avoid systems they expect lack usability. Addressing these issues through standard accessibility practices, live assistance and thoughtful interface design can enhance user interaction and trust. For accessibility issues that cannot realistically be eliminated, technology that enhances cooperative relationships and allows account owners to control information sharing is key.

Topics: Accessibility; Bank notes; Central bank research; Digital currencies and fintech; Digitalization; Financial services
JEL codes: A14, C90, D83, O33, Y80

Résumé

L'élimination des obstacles pour les utilisatrices et utilisateurs de systèmes de paiement numérique passe obligatoirement par une approche de conception axée sur l'inclusivité et la convivialité. Notre étude vise principalement à favoriser l'empathie envers les personnes dont les comportements témoignent d'obstacles sur les plans de l'accessibilité ou de l'utilisabilité, et à déterminer les besoins de celles-ci. Plus précisément, nous examinons deux groupes d'utilisatrices et utilisateurs répartis en fonction de deux comportements courants : se fier aux autres pour effectuer des tâches et éviter d'interagir avec les technologies.

La Banque du Canada s'est associée à l'Inclusive Design Research Centre de l'Université de l'École d'art et de design de l'Ontario pour mieux comprendre ces deux groupes. Grâce à des séances de conception coopérative, nous avons cerné des situations où la coopération est requise, des fonctionnalités de système qui facilitent le soutien pour les opérations bancaires et des difficultés rencontrées par la clientèle et les personnes qui l'aident.

Nous constatons que les personnes des deux groupes évitent les systèmes de paiement lorsqu'elles s'attendent à ce qu'ils manquent d'utilisabilité. Pour aider à améliorer les interactions des utilisatrices et utilisateurs et renforcer leur confiance, il faut appliquer des pratiques standard d'accessibilité, offrir une assistance en direct et concevoir une interface

réfléchie. Pour les problèmes d'accessibilité qui ne peuvent pas être éliminés, il est essentiel de tirer parti des technologies qui améliorent les relations de coopération et permettent aux titulaires de comptes de contrôler le partage d'information.

Sujets : Accessibilité; Billets de banque; Recherches menées par les banques centrales; Monnaies numériques et technologies financières; Numérisation; Services financiers
Codes JEL : A14, C90, D83, O33, Y80

Introduction

The Bank of Canada is committed to the principles of inclusivity and accessibility. This commitment to universal access guides policy and design objectives, particularly considering the ongoing digitalization of payment systems. Digital inclusion, financial inclusion and accessibility for those with disabilities or functional limitations are key components that underpin universal access (Sutton-Lalani et al. 2023).

Designing more inclusive and user-friendly solutions is essential to improve digital payment systems and eliminate existing barriers faced by Canadians engaging with digital systems. By listening to Canadians, the Bank strives to understand and emphasize the needs of specific groups that are hard to reach and often overlooked. The objectives of this research are to foster empathy and uncover the needs of people who exhibit behaviours indicative of accessibility or usability deficiencies in digital systems.

In this study, we focus on two common behaviours among Canadians who face difficulties making digital payments:

- collaboration, which involves frequently relying on others to perform a task
- technology avoidance, which is deliberately avoiding interacting with technology

To better understand the needs of these groups, the Bank partnered with the Inclusive Design Research Centre at the Ontario College of Art and Design (OCAD) University. OCAD University researchers worked with end users on co-design research initiatives. These activities concentrated on gaining a deeper understanding of the needs of customers who require assisted-banking services and who are hesitant about using technology. The objectives of the research were to pinpoint:

- scenarios where individuals require a support person to perform transactions
- system features that facilitate a support person to provide help to an individual
- pain points customers and their support people encounter

This study also looks to formulate design strategies and recommendations that cater to the needs of individuals who need supported banking, are reluctant to adopt technology or both. Ultimately, this research aims to foster empathy for users who face challenges with digital systems—whose needs are often overlooked during the design of payment systems—and inspire solutions for these users. Contrary to the prevailing belief that these users prefer analog solutions, our results show that they actively avoid using systems that they anticipate lack usability.

Study design

Co-researchers

Participants were selected because they exhibited behaviours that implied that they had concerns about using technology, rather than based on demographic criteria. This behaviour-based segmentation is based on the Bank's previous experience with user research. Warren et al. (2024) show that selecting participants based on their technological proficiency and financial confidence is more indicative of user behaviour than traditional demographics are. The key behaviour we use to select participants is technology avoidance. Technology avoidance appears in two forms:

- being reluctant to use technology or avoiding it when possible, which is the simplest form
- engaging someone else to use technology in the user's stead, which we call supported banking

Technology reluctance

Many people say that they prefer analog systems or that they even have an aversion to using digital systems. These people often choose to interact in person at a bank rather than use a website or mobile app. There are some advantages to interacting in person at a bricks-and-mortar location, including receiving personalized help and having social interactions. However, some users may be avoiding using digital systems because the design does not meet their needs rather than because they prefer in-person interactions. If users are in fact unable to use a digital system due to its design, then the system is disabling the user rather than the user being tech averse. This framing that looks at how barriers prevent participation is known as the social model of disability (Parliamentary and Health Service Ombudsman, n.d.). For this reason, we endeavour to understand why some users choose to avoid technology so that we can design systems that are more compatible with individuals' needs.

Supported banking

Canadians cannot completely avoid using banking and payments systems and products because they are essential to everyday life. In some cases, users that need assistance turn to others for help performing transactions. Results of a study by Employment and Social Development Canada (2022) reveal that many users require help to make payments and often give their personal identification numbers (PINs), account numbers and passwords to people they trust or, in some cases, even strangers to help perform transactions. These informal collaborations put the account holder at risk because they violate the terms and conditions of accounts and open the user to the risk of fraud.

Many of the issues that cause people to seek help are because systems at the point of sale are incompatible with users' needs and require redesign and standardization. However, some of these interactions also take place at home or while using digital products on a client's own phone or computer. We seek to understand these collaborative relationships with the goal of finding ways to reduce users' reliance on others where possible, and to facilitate these relationships where needed.

Research questions

The experimental design focused on three main categories of research questions. These questions aimed to identify where users experience pain points with the technology and to empathize with users who avoid using technology or who are unable to independently use technology.

First, we seek to identify customers' needs related to supported banking. These questions asked about:

- scenarios where collaboration is essential for using banking services
- the features that collaborators (trusted individuals, support workers, etc.) need to facilitate supported banking
- the pain points experienced by both primary users and collaborators

Next, we delve into the mindset of people who are hesitant about technology to examine the technological features and situations or contexts that lead users to avoid technology.

Finally, we consider ways to mitigate technology avoidance by:

- proposing design recommendations to make technology compatible with supported banking
- highlighting design mistakes to steer clear of
- suggesting effective design patterns
- identifying key elements that can enhance user acceptance of technology

Methodology

Recognizing the pivotal role the disability community plays in our research, we adopted a collaborative research methodology. This method allows us to leverage the collective expertise and experiences of community members, fostering shared understandings and collaborative learning.

Co-research embraces participatory approaches, valuing the unique perspectives of individuals who offer their personal experiences as vital resources in informing the direction of the research. We invited community members with lived experience of disability and barriers to access as well as their supporters to be co-researchers, thereby leveraging their expertise in the research. To develop shared understanding and co-create solutions, we use the inclusive ASK Framework (Roberts and Pereyra 2023), which stands for:

- **appreciating** the value of lived experience and expertise of co-researchers
- **scaffolding** knowledge of the topic and research method for co-researchers so that they can participate equitably
- **keeping knowledge** and lessons from the research within the community that produced it by keeping co-researchers engaged in all aspects of the research—through analysis and synthesis as well as dissemination

The recruitment process was inclusive. A plain-language invitation describing the research and responsibilities was sent to a mailing list of experts with disabilities and to organizations in the disability community. Co-researchers were selected to provide a range of:

- ages
- visible, hidden and episodic disabilities
- locations
- other intersectional identities

Our co-researchers ranged in age from 26 to 65 years. The range of disabilities experienced by the co-researchers included:

- anxiety
- blindness
- cerebral palsy
- depression
- diabetes
- hearing impairment
- minor arthritis
- mobility impairment or use of a wheelchair
- motor disability
- non-speaking augmentative and alternative communication user
- obsessive compulsive disorder
- schizophrenia

Co-design sessions were run remotely to broaden the pool of people who could participate. For example, the supported banking user group met online via Zoom. However, the technology reluctance group performed its activities offline and asynchronously so that co-researchers didn't have to use online meeting technology, which could have been a barrier to participating for members of this group.
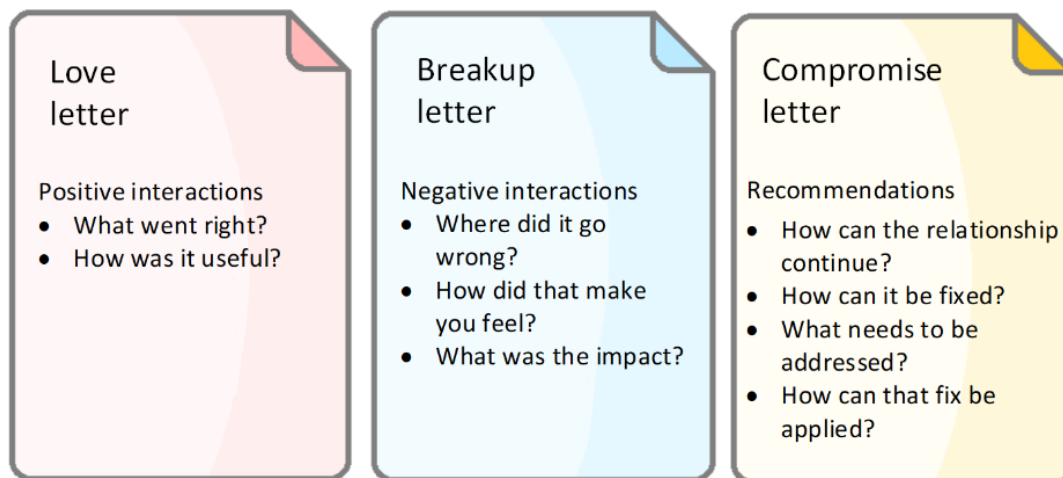
Letter approach for technology reluctance group

Following some prompts, co-researchers in the technology reluctance group were asked to write three letters to a technology based on the breakup- and love-letter method (Martin and Hanington 2012) (**Figure 1**):

- a love letter where the writer expressed what went right and how the technology was useful for them
- a breakup letter where co-researchers expressed what went wrong, what the impact of those issues was and how that made them feel
- a compromise letter that captured co-researcher's recommendations and reimagining of their relationship with that technology, acknowledging that our reliance on technology often necessitates compromise

These letters provided a systematic method for the co-researchers to reflect on and express their experiences with their chosen technology. Through these letters, participants shared their thoughts on the psychological aspects, financial skills, convenience, support, security and ethical considerations related to technology use.

Figure 1: Letter approach for technology reluctance group

Love letter
Positive interactions
- What went right?
- How was it useful?

Breakup letter
Negative interactions
- Where did it go wrong?
- How did that make you feel?
- What was the impact?

Compromise letter
Recommendations
- How can the relationship continue?
- How can it be fixed?
- What needs to be addressed?
- How can that fix be applied?

1-2-4-All process for supported banking group

The 1-2-4-All process (Lipmanowicz and McCandless, n.d.) aims to find solutions for a given topic in a collaborative manner. It starts with co-researchers being prompted with a question that requires them to reflect individually. Then, co-researchers are encouraged to build ideas gradually in groups of two, then four and finally all together in a collective brainstorming session. This procedure was repeated for each of the scenarios listed in **Table 1**.

Table 1: Time spent in groups of two and four and all together discussing scenarios

Round and scenario	Group of two	Group of four	All
1. General scenario: Challenges or frustrations that co-researchers and their supporters face when using digital banking or doing financial tasks online	5 minutes	10 minutes	15 minutes
2. Checkout scenario: Times when co-researchers needed or provided help when paying with a debit or credit card at a point of sale. What went wrong or why was help needed?	5 minutes	10 minutes	15 minutes
3. Account security: Benefits or drawbacks of account security measures for their digital banking or online financial tasks	5 minutes	10 minutes	15 minutes
4. No branch: Banking when access to bank is not possible, e.g., during COVID-19 lockdowns or when travelling. Tools or methods they use or prefer to use in this situation.	5 minutes	10 minutes	15 minutes
5. Account preferences: Reasons or situations that cause them or someone they know to need help with online banking tasks, e.g., setting account preferences or notifications.	5 minutes	10 minutes	15 minutes
6. Interac e-Transfer® or bill payments: Benefits or drawbacks of using e-transfer compared with other methods of payment, given that co-researchers often use e-transfer or bill payments to send or receive money online.	5 minutes	10 minutes	15 minutes
7. Shared access challenge 1: Not everyone has access to a trusted person to help with financial matters. Even when you trust each other, it can be nice to maintain privacy about financial matters or purchases. Choose a few financial tasks that might be shared. What information needs to be shared and what doesn't to accomplish the task together?	5 minutes	10 minutes	15 minutes
8. Shared access challenge 2: Right now, when we collaborate on our banking, we give the keys to the whole thing. Access with our PIN is access to everything. What if it could be different?	5 minutes	10 minutes	15 minutes
9. Shared access challenge 3: Think about the kinds of support roles that could exist and determine the level of access to financial information. Let's start by thinking of times when an individual might need help—where are they and what is their goal? Who might help, and what are their roles? What access should each role have? What factors might allow temporary increased access?	5 minutes	10 minutes	15 minutes

Findings

We identified essential contexts for supported banking and critical pain points that deter people from using technology for banking. There were overlaps in the pain points experienced by collaborators and people who are technology reluctant, such as issues with authentication and receiving help. However, input from co-researchers revealed that:

- technology-reluctant people generally avoid technology because of overarching system concerns
- people who require support struggle with specific tasks within the payment experience

We next discuss the major themes that emerged from each group of co-researchers, beginning with the supported banking group.
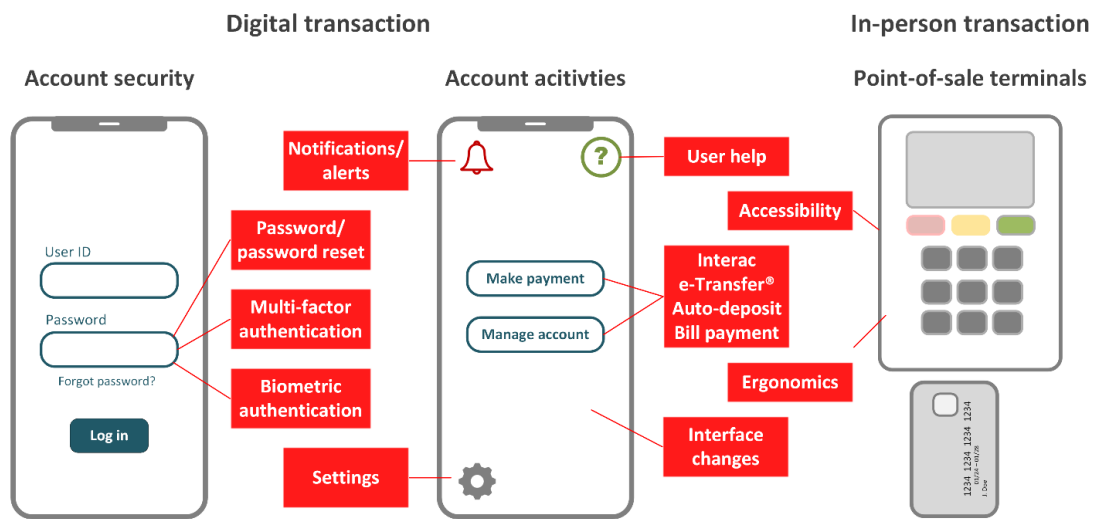
Supported banking

The supported banking group revealed the main areas where safe and smooth collaborative banking needs to be facilitated. A major gap identified was maintaining a user's account privacy and security when collaborating on financial activities with a supporter.

However, the research also highlighted the importance of promoting independent financial activities by removing barriers so that users would not have to rely on a supporter in the first place. Co-researchers found common pain points in both digital and in-person financial activities (**Figure 2**):

- Users needed support at each step in the process of performing transactions on an online or a mobile platform, including navigating the platform interface, authenticating a user's identity, and authorizing transactions.
- For in-person payments, co-researchers typically require support with using different point-of-sale technologies.

These findings correlate to the issues detailed by Employment and Social Development Canada (2022), suggesting that these barriers have not yet been removed.

Figure 2: Pain points in banking1

Digital transaction   **In-person transaction**

Account security   **Account acitvties**   **Point-of-sale terminals**

Notifications/alerts · Password/password reset · Multi-factor authentication · Biometric authentication · Settings

User ID · Password · Forgot password? · Log in

Make payment · Manage account

User help · Accessibility · Interac e-Transfer® Auto-deposit Bill payment · Ergonomics · Interface changes

Shared access

A major challenge users face is that they often have to share account information, such as a PIN, with another person.

Currently, the Financial Consumer Agency of Canada and all financial institutions recommend that individuals should not share their access information unless they granted someone else power of attorney or have a joint account. This means that the appointed supporter is given the same level of access as the individual being supported. This all-or-nothing measure is not a suitable option for people who need support but do not wish to grant their supporter complete access to their financial information or the ability to make financial decisions for them. It also does not address situations where an individual requires help and their appointed supporter is absent, such as when the individual is at a store alone and has trouble using a point-of-sale terminal. As a result, people often find themselves sharing their security information with a supporter who does not have legal access to their account or, even worse, with a stranger (e.g., a store clerk). Such sharing often violates the terms and conditions of financial institutions, meaning that this already vulnerable part of the Canadian population may lose the protection that these institutions provide against unauthorized payments or fraud (Financial Consumer Agency of Canada 2024).

Appointed supporters—who usually are not joint-owners or did not hold power of attorney—also encounter challenges with having full access to another individual's financial information and accounts. Supporters also preferred a lower level of access. For example, supporters often find themselves in delicate situations where they need to balance providing assistance and the potential risk of being held accountable for any unauthorized account activities that are not their fault.

Access barriers to independent banking

Generally, people require assistance—either from their trusted supporters or customer service representatives—when using technologies such as digital payment portals or payment terminal machines. These technologies present critical barriers to independent banking that co-researchers agreed need to be addressed. Co-researchers identified four scenarios where barriers should be removed:

- when using an online or mobile banking app
- when paying in person at a checkout
- when trying to log in or reset a security password
- when sending an electronic transfer or paying bills

General experiences with online or mobile apps

Certain features and settings of online or mobile banking apps are difficult for co-researchers to navigate on their own. For example, some report needing help from their supporters to customize notification and alert settings to suit their unique experience, lifestyle or personal preference. And even after someone becomes familiar with an app and can use it on their own, they have to learn a new feature or adjust to a new layout whenever an update introduces changes to the interface. This adjustment can be especially stressful and lead to loss of independence for those who use assistive technologies or those who live with conditions that affect their cognitive capacities. Furthermore, no standardized measure exists to ensure each update maintains the same level of user accessibility as the previous version. Consequently, users can find the updated version less accessible than the previous one.

When people call customer services for help, they also face accessibility challenges. For example, some identified difficulties include voice-recognition menus that do not recognize speech with accents or speakers with dysarthria, which refers to weakness in the muscles used for speaking. Another difficulty was having to navigate through the voice-recognition menu to reach a human assistant who has the knowledge of the specific assistive technologies that people require help with.

In addition, some organizations do not recognize a supporter as a customer's trusted representative and refuse to speak with them even after customers have given permission. For example, a co-researcher who is blind could not complete a transaction over the phone because the customer service representative refused to assist after hearing the supporter in the background say the amounts that should be paid. This example reinforces the importance of having measures to safely and smoothly support individuals in financial activities without requiring them to grant supporters full legal access to their accounts.

In-person checkout

In-person point-of-sales and other payment terminals also present barriers to independent payment transactions.

Physical barriers predominantly include sales terminals that:

- are too high or not ergonomic
- [have/provide] only touch screen access
- are not correctly marked with a raised dot on the 5 to help individuals with low vision
- have buttons that are too worn to read

When co-researchers encounter these barriers, they often need help from store clerks or strangers, which increases their level of vulnerability to security risks. In addition to the removal of these barriers, co-researchers said they also need ways to mitigate security risks when they do need support from strangers, such as a temporary PIN.

Payment terminals also create cognitive load–related barriers for individuals with cognitive challenges such as memory loss. Currently, there are no universal standards to make devices and applications across the payments ecosystem accessible. Co-researchers are exposed to different types of machines, cards and payment methods, including some that are not accessible, which leads to anxiety for users and challenges to making independent transactions. Moreover, user interfaces are inconsistent and often provide many options that are too complex for co-researchers to navigate on their own.

Account security

The increased need to maintain security and privacy has increased the complexity of authenticating a user's identity, which in turn has increased the cognitive demand on users.

For example, many platforms don't allow users to reset a password if it is the same as or similar to one that was used previously. This means that individuals who need assistance signing in not only have to correctly remember the new password, but they also need to notify their supporter about the change. If a platform automatically stores passwords in a vault, individuals also need to make sure the password is updated to prevent the platform from filling in the old password. Failing to do any of these steps can start the cycle of resetting a password again. To alleviate this pain point, co-researchers advocated for restricting the reuse of old passwords only in the event of a security breach rather than in instances of memory failure.

Similarly, secret questions that platforms use to authenticate a user's identity often require responses to perfectly match the original answers provided, including capitalization. The need to correctly remember not only the answer but also the capitalization adds another layer of burden to the sign-in process. Co-researchers identified these as sources of potential frustration, especially for individuals with anxiety, attention deficit hyperactivity disorder or other conditions that limit their cognitive capacity, attention capacity or both.

Many Canadian financial and banking service providers have adopted multifactor authentication (MFA)—the use of two or more ways to verify a user's identity so that they can sign in to an account. Typically, MFA combines a password with a temporary code received by text message, phone call or email. MFA is expected to become more common in digital

banking services because the Office of the Superintendent of Financial Institutions (2022) released guidelines suggesting how federally regulated financial institutions could bolster their cybersecurity.

For individuals who are less comfortable with technology or have limited access to technology, the process of entering the correct password, finding the temporary code sent to a separate app and entering the code before it expires is complicated and frustrating. For example, a parent of one co-researcher owns a mobile phone that connects only to Wi-Fi and a home phone with an extension, requiring the parent to receive verification codes by email only. However, the parent struggles to view the code in the email without closing the log-in window and return to the account sign-in page, which was closed in error, before the code expires. This forces the parent to rely on their child to log in to the account for them and complete financial activities on their behalf. Co-researchers showed preference toward less involved authentication options, such as using biometrics, to minimize the need for collaborators.

Once configured, biometric authentication is a less complicated way for co-researchers to sign in independently by having their device recognize their face or fingerprint, for example. Most apps that offer this option require users to navigate to the settings page and set up the authentication service themselves, a process that many co-researchers find too complicated to complete on their own. Some co-researchers were unaware that such a feature was available. At the same time, biometrics alone could be problematic if apps do not have alternatives when needed (e.g., a person has a bandaged fingertip).

Interac e-Transfer and bill payments
Transferring money electronically causes stress and anxiety for co-researchers over concerns about being scammed or misdirecting payments and not being able to fix it. Co-researchers desire:

- ways to get their money back when people are scammed or misdirect payments
- an easier way to identify the payee, such as with an image
- options to make the payment without using a web or mobile app

Co-researchers also find that the process to set up auto-deposits and online bill payments is too complex and that institutions do not provide sufficient resources to make the process easier. Overall, co-researchers would prefer to have access to support from staff at financial institutions so that they could make e-transfers easily and with confidence.

Technology reluctance
Some of the pain points identified by co-researchers in the technology reluctance group were similar to those experienced by co-researchers in the supported banking group. However, the majority of the pain points for the technology reluctance group were not barriers to specific tasks like those identified in the supported banking research group but were related to overarching characteristics of the system and service delivery. The following themes emerged

as reasons users were reluctant to use technology. Where possible, we illustrate themes with quotes from the letters written by co-researchers.

Trust

Like most users, co-researchers expect their electronic products and financial services to be very reliable. They reported that downtime makes the system seem unreliable and causes stress. They also expressed frustration with trying to solve an issue that ultimately was caused by a system outage.

> "Lately, I've been feeling unhappy with you [the system] because sometimes when I need to make an immediate fund transfer, there is an unknown error that pops up for no apparent reason."

Co-researchers lost trust in a system when they lacked enough feedback to understand what the system was doing, particularly when the system was down. Co-researchers from both the Technology Reluctant group and the collaborators group noted that they avoid using e-transfers due to worries that they will make an input error and thereby losing funds. This concern is compounded by the fact that there is often a delay between the time the money is sent and the arrival of a confirmation message that the funds were received.

Co-researchers also expressed a need for accommodating and accessible customer support and a preference for it to be backed up by accessible bricks-and-mortar branches. Because of this, co-researchers appeared to mistrust companies or products that couldn't serve users with different accessibility needs. Statements such as "*I can't trust you when you don't have a physical branch*" allude to a mistrust of products and companies that don't appear able to serve Canadians with different accessibility needs. Product offerings that do not include accessibility features exacerbate this mistrust. In contrast, companies that do pay attention to accessibility create trust.

> "The way that your system is set up makes me feel strong and independent and that I do have the capacity to understand my deposits because they are set up in an accessible way that works for me."

The overall ethos of a company—including its relationships and the investments of financial institutions—affected users' trust of the company and their willingness to use its products. One co-researcher felt tricked into investing through their financial institution in what they believed was an unethical company. They also felt uneasy about the bank's decision to invest in the company. Furthermore, the co-researcher had a difficult time navigating their investments to divest from the company.

Cost

Concerns about costs are closely related to technology reluctance. Some co-researchers were hesitant to adopt new banking technologies due to concerns about the costs involved. This is

likely compounded by their experiences of incurring unexpected costs when using current payment technology.

"You'd rather put me in overdraft and charge [me] more than notify me so that I can move money around."

Affordability is a crucial factor for many co-researchers, especially those with disabilities who may have limited financial resources. Co-researchers recommended that banks consider the financial constraints of their customers and offer less expensive solutions that do not compromise the quality or accessibility of services.

Additionally, co-researchers indicated that banking services that have hidden or unexpected costs can create financial barriers and erode trust, and they highlighted the importance of transparency. They expressed a need for clear information about charges and fees associated with banking transactions. These findings suggest that service providers can help build trust with users by providing detailed and understandable cost breakdowns. Doing so could also prevent potential dissatisfaction due to unexpected expenses. In addition to cost transparency, clients expressed frustration that lack of clarity on system decisions forced them to use more costly and time-consuming services to achieve their banking goal. For example, several co-researchers cited incidents where errors, such as having funds in the wrong account, caused financial losses like overdraft fees.

"Recently, while attempting a money transfer to an account in another country, the recipient's bank account number was too long for the field on your form. You eliminated some digits to allow the number to fit your form. I was alarmed that an abbreviated account number would invalidate the transfer, or worse, cause money to enter the wrong person's account. I could find no explanation for this occurrence on your website. I contacted customer service who were unable to assist and suggested I visit a branch in person for assistance. An in-person visit to a branch did not result in an answer to the problem. The staff suggested a wire transfer, a secure method of sending money. The transaction was done by bank employees and required one hour to prepare the necessary paperwork. The fee for this service was $50.00."

The theme of cost is closely related to technology reluctance. Some co-researchers were hesitant to adopt new banking technologies due to concerns about the costs involved. This is likely compounded by the experiences of incurring unexpected costs with the current payment technology they're using. While the challenge in the example above may not be directly related to disability, having to pay more for products and services due to access barriers is frustrating for individuals in the disability community who call these additional costs the "disability tax."

Interface design

Pain points identified in the interface design include issues with authentication, passwords, accessibility and the need for better customer support. Co-researchers underscored the significance of interfaces that are intuitive, easy to navigate and adaptable and that facilitate independence and do not create additional barriers to banking. The design should reduce the cognitive load on users, allow them to personalize settings and facilitate collaboration. Complicated menus, unintuitive symbols and truncated account numbers caused confusion for users. Co-researchers noted that on-screen promotions were overwhelming.

> "One thing that I don't like about you is the icon for transferring funds between accounts and the icon for sending money (P2P) are incredibly confusing. They don't look incredibly similar, but they could easily be assigned to each other as they are quite vague."

A co-researcher was also distressed by being misgendered, having their deadname used and not being able to update their name in all parts of the system.

Sensory accessibility

Some pain points were directly related to lack of design for people who are blind, low vision or deaf. For example, a user said that a product did not provide videos with American Sign Language (ASL) and noted that written English is not equivalent to ASL. Features like depositing a cheque by taking a photo of it were not accessible to visually impaired users. Finally, the browsers required by the financial tool were in some cases different than the co-researcher's preferred browser, leaving the person unable to use their preferred tools.

> "I am dealing with communication barrier daily. And English is not my first language and ASL is not English. It is easy for me to misunderstand when reading English. I prefer ASL because it is my first language and I sign everyday."

Security and privacy

Security is a significant concern for co-researchers, especially in the context of banking and financial transactions. Co-researchers highlighted the need for robust security measures to protect users' financial information and transactions. Trust is built through reliable security features, consistent performance and the assurance of privacy. Users value features like fraud detection and secure login processes, which contribute to a sense of safety and trust in banking services. Therefore, while users were seeking strong security protocols, many of these protocols caused issues for them.

Authentication barriers

Verifying a user's identity appeared to be a significant pain point. Users often struggle with authentication processes, which can create a barrier to accessing banking services. Many co-

researchers identified MFA—or using two authentication methods for added security—as a pain point for reasons that included:

- not having a mobile phone
- trouble meeting the timing restrictions on MFA codes sent to a secondary device
- issues with losing or changing the phone or device used as the second factor

Co-researchers suggested that financial institutions should explore alternative authentication methods that are more accessible and user-friendly, such as biometric options, to alleviate these challenges.

> "I have to wait for a code or verification sometimes and that takes time out of my day. This is important to me because sometimes I need to make immediate payments and having to log in to the mobile app and wait for a code can take a lot of time, especially if I am at a checkout."

Co-researchers were frustrated with the process of creating security questions and passwords, particularly having too many banned characters limiting their choice and potentially increasing their chance of making errors. For example, co-researchers found the process to create a security question for an e-transfer difficult. They worried their e-transfer wouldn't go through because the recipient or sender may make a mistake and the passwords would not match.

Recommendations from co-researchers

When a product lacks accessibility, it can force users to increase their reliance on collaborative banking and discourage people from using the product. Both groups of co-researchers identified the user interface experience and the security measures as obstacles to independently and confidently using a payment product. The complexity of these features not only presents an accessibility challenge, but also fosters a sense of mistrust among users toward the product.

For a simpler and more accessible interface design, co-researchers recommended:

- accommodations for sensory accessibility needs, such as sign language videos
- compatibility with different assistive technologies
- a wizard feature to provide support and guidance with common tasks
- use of intuitive icons and simpler layout design that stay consistent between updates
- a toggle button to switch between old and new interfaces after an interface update
- accessibility testing before each update

While co-researchers recognize the importance of security measures like MFA to protect their accounts, they recommended that financial services offer alternatives measures that are easier to use, such as biometric authentication, and streamline processes to set up these measures. They also advocated for fewer restrictions on reusing old passwords, particularly when password errors are caused by memory failure rather than security breaches.

To mitigate the psychological barriers associated with making e-transfer payments and the risk of payment errors, co-researchers recommended easier methods for identifying payees, such as using images, and increased institutional support for addressing errors or payment misdirection.

Lastly, co-researchers also provided recommendations to ensure individuals can receive necessary assistance with financial activities while maintaining their account security and privacy:

- allow notifications to be sent to more than one individual
- create an access mode or interface for the support person that can be personalized to the needs of the account holder and their collaborator
- enable ways to allow customized or limited access for support people
- make adding and removing support people from accounts easy for the account holder to do
- enable the account holder to issue a time-limited password to a collaborator
- enable financial information to be blurred so that someone can help a user navigate a payment system without being invasive
- create an interface for collaborators or a support person
- facilitate remote support and guidance by enabling a one-time link that is internal to the application to share a screen or allow for mouse control

Conclusion

It appears that reluctance to use technology does not stem from a client's inherent characteristics but rather from unsatisfactory experiences or products that fail to meet their needs, including those related to accessibility. A single issue doesn't deter users from technology, but an accumulation of minor errors and issues that gradually undermine their trust leads them to generally avoid technology. Many of these problems can be addressed by applying standardized accessibility and usability practices and providing live assistance. Further, more thoughtful interface designs that provide users with ample information and feedback could resolve other issues, enabling users to understand how to interact with a system and anticipate its responses.

Likewise, while certain users may require assistance due to physical or cognitive conditions that technological modifications are unlikely to address, the majority of users require help due to designs that overlook their needs. Co-researchers generally prefer to operate independently, but when assistance is needed, they desire a formalized system that allows them to control their helper's access to information to maintain their privacy and security. Supporters also believe a restricted view of personal data was advantageous, addressing their unease about having excessive access to their client's or collaborators' finances and private information. In general, collaborators would appreciate technology that enhances their cooperative relationships rather than having to resort to makeshift solutions. The key feature

identified for such a technology is giving control to the owner of the account, allowing them to decide how much information they share.

The findings underscore the critical importance of inclusive research and design in technology development. Users are not inherently averse to technology—they simply seek products that function reliably and meet their needs. By prioritizing accessibility, usability and thoughtful interface designs, technology designers can create technology that not only empowers users but also fosters trust and independence. Ultimately, all users want a seamless experience where technology works intuitively and effectively, enhancing their daily lives without unnecessary complications.

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