Navigating Financial Systems: Addressing Digital Banking Barriers for East Asian Immigrants in Canada

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Abstract

This research explores the mobile banking experiences of Mandarin-speaking newcomers in Toronto, with a focus on the role of in-app chatbots in supporting or hindering their financial interactions. Using an inclusive design research approach, the study combined semi-structured interviews and a participatory co-design session to identify usability challenges and explore design opportunities. Thematic analysis of five interviews revealed four major pain points: uncertainty about chatbot capacity, confusion caused by irrelevant information, cognitive overload from complex app interfaces, and a lack of support in understanding Canada's credit system. These themes guided a co-design workshop involving seven participants who contributed reflective feedback and proposed improvements to current user experience designs. Findings suggest that the information architecture of the current banking app is overwhelming for newcomers, and the information is often overflowed. Also, while chatbots hold potential to streamline banking workflows, their current implementations often fall short due to generic responses, poor contextual understanding, and lack of multilingual support. The research highlights the need for more transparent, culturally responsive, and linguistically inclusive design strategies. The resulting prototype proposes a simplified information architecture and a context-aware chatbot flow that together aim to enhance user confidence and financial autonomy among Mandarin-speaking newcomers. These insights contribute to the broader discourse on inclusive fintech design and call for deeper engagement with marginalized users in the development of digital financial services.

Table of Content

List of Figures

Background

Navigating the Canadian banking system presents a range of challenges for newcomers, particularly those who are Mandarin-speaking and newly settled in urban hubs like Toronto (Government of Canada, 2023; Government of Canada, 2024). Mobile banking apps, while designed to simplify and expedite banking tasks, often become a source of confusion and frustration for these users due to unfamiliar financial systems, language barriers, and culturally mismatched digital interfaces (Ashcraft, 2024). Many newcomers report struggling with understanding how Canadian credit works, managing banking tasks digitally, and interpreting the terminology and flows within apps (Government of Canada, 2023). These challenges are compounded by a lack of personalized support and accessible resources, leaving many to rely on trial-and-error methods or peer support (*Interac Survey Reveals Newcomers Lose Financial Confidence after Arrival in Canada*, 2024).

Among the tools aimed at simplifying user experiences in mobile banking is the in-app chatbot, a conversational AI tool embedded within banking apps. These bots are intended to streamline customer service workflows and reduce wait times by guiding users through common banking tasks (Kediya et al., 2024; Zia et al., 2024). However, from a user experience perspective—especially for Mandarin-speaking newcomers—questions remain: Does this technology serve its intended purpose for all users? Or does it, in fact, create additional obstacles due to unclear architecture, language mismatches, or overly generic or even meaningless responses?

This research zooms in on Mandarin-speaking immigrants' interactions with mobile banking apps and their in-app chatbots, focusing on the usability and effectiveness of these tools from an inclusive design perspective. Drawing from secondary literature, it's clear that immigrant communities in Canada face persistent barriers when dealing with personal finance—ranging from limited credit history and low financial literacy to language difficulties and systemic financial exclusion (Government of Canada, 2023). However, a critical gap exists in understanding how digital banking tools, like chatbots, accommodate or hinder their user

experiences. This study addresses that gap by exploring the specific obstacles faced and proposing design interventions that could enhance these tools for more equitable and supportive financial engagement.

Barriers to Personal Banking Among Mandarin-Speaking Newcomers

Mobile banking App is conveniently one of the most accessed tools for immigrants, however, Mandarin-speaking newcomers in Canada, particularly those settling in urban centers like Toronto, encounter multiple systemic and interpersonal challenges when navigating the personal banking system. One of the most pressing issues is the difficulty in understanding and adapting to the Canadian credit system. As Rostamkalaei and Riding (2020) emphasize, immigrants often arrive with limited or no credit history, a crucial factor for accessing financial services in Canada. This lack of credit documentation becomes a barrier to securing loans, credit cards, or mortgages, ultimately impacting long-term financial stability.

In addition, financial knowledge gaps are prevalent among new immigrants. Khan et al. (2022) discuss how these gaps not only hinder sound financial decision-making but also contribute to broader economic inequalities. This is echoed by the Financial Consumer Agency of Canada (2023), which highlights that 23% of newcomers struggle with basic financial tasks, such as understanding interest rates or budgeting, due to unfamiliarity with Canadian financial terminologies and products. The issue is further exacerbated by cultural differences in financial practices, as many newcomers come from societies where informal savings and familial financial support are the norm (Ahairwe & Bisong, 2022).

Language barriers play a crucial role in deepening these challenges. As noted in a recent Statistics Canada report (2024), recent immigrants are more likely to report financial stress and dissatisfaction with their quality of life. The report suggests a correlation between language proficiency and financial independence, reinforcing the importance of linguistically inclusive banking tools. Additionally, Ashcraft (2024) identifies a trust gap between immigrants and

Canadian financial institutions, where previous experiences with corrupt or inaccessible systems in home countries lead to reluctance in engaging with formal banking.

Emotional and psychological dimensions also shape financial behaviors. The Interac (2024) survey revealed that newcomers often experience a loss of financial confidence after arriving in Canada. This erosion of confidence is not only due to systemic barriers but also a lack of culturally attuned financial support systems. For example, older Hong Kong immigrants in Toronto often rely on community networks rather than formal services due to perceived alienation from digital banking platforms (Tang & Chandra, 2022).

Digital literacy is another key barrier. Zia et al. (2024) underscore that although mobile banking apps offer convenience, many immigrants feel overwhelmed by the volume and complexity of information. These apps often fail to consider users with low digital fluency or those unfamiliar with Canadian banking workflows. For Mandarin-speaking users, this issue is compounded by non-intuitive interfaces, lack of translation support, and information overload.

Collectively, these studies portray a multifaceted challenge: newcomers are navigating a system that not only demands a certain level of pre-existing knowledge but also often lacks the cultural and linguistic responsiveness necessary to facilitate meaningful integration. An inclusive design perspective calls for banking services that recognize and respond to these varied needs, offering flexibility, customization, and community-centered support mechanisms.

Evaluating the Usefulness of In-App Chatbots in Mobile Banking

With the rise of digital banking, AI-powered chatbots have become a common feature in mobile banking apps. However, their efficacy and accessibility remain contentious, particularly among immigrant users. In the context of your research, Mandarin-speaking users expressed uncertainty about chatbot capabilities, and confusion due to irrelevant or overwhelming information.

Kediya et al. (2024) conducted a comparative analysis revealing that while chatbots can reduce operational costs and offer 24/7 assistance, user satisfaction heavily depends on how contextually aware and culturally sensitive these bots are. Many chatbots fail to recognize the nuances of immigrant inquiries, often defaulting to generic responses that do not align with users' immediate needs.

Moreover, there is growing concern about information overload, as highlighted in your study's second theme. Kaliappan et al. (2024) argue that large language models (LLMs), although powerful, can overwhelm users if not properly curated. This issue is especially pronounced in the case of immigrants who may already be navigating linguistic and cultural differences. The lack of tailored content and simplified user interfaces creates friction and often drives users away from engaging with these tools.

An additional concern is the chatbot's inability to build trust. Roberts et al. (2024) emphasize the importance of digital autonomy and explain how older users, including immigrants, tend to favor human interaction due to the perceived impersonality and limitations of AI-driven agents. Your co-design findings that users disliked receiving irrelevant or overly detailed responses align with this notion. A chatbot that cannot discern user intent or personalize communication may be seen as more of a hindrance than a help.

Zia et al. (2024) further stress that users often switch between chatbot and human agent due to unsatisfactory responses, pointing to a lack of continuity in the service flow. This disruption in workflow diminishes the app's efficiency and contributes to user frustration. While multilingual AI chatbots are being developed to break language barriers in global business, their adoption in banking services remains limited. These chatbots leverage natural language processing and machine learning to understand and respond in multiple languages, offering real-time translation and personalized interactions. However, the integration of such technology into banking chatbots is still in progress (Verma, 2024).

Despite these limitations, chatbots hold potential when implemented thoughtfully. As research suggests, their usefulness hinges on transparency (users knowing what the bot can and cannot

do), relevance (providing appropriate responses), and simplicity (avoiding jargon or excessive detail). From an inclusive design standpoint, improving chatbot workflows would involve co-designing with users, especially those with lived immigrant experiences, to ensure systems are responsive, empathetic, and intuitive.

Research Methodology & Goal

I took an inclusive design research approach in this study to better understand the nuanced challenges Mandarin-speaking newcomers face when navigating mobile banking apps in Canada. While existing literature outlines broad financial barriers for immigrants—such as limited credit history, financial literacy gaps, and language difficulties—there is a notable gap in exploring how digital tools, especially in-app chatbots, support or hinder these users in real-time banking interactions.

My secondary research revealed that while chatbots are increasingly common in banking apps, their effectiveness remains uneven, particularly for users from immigrant backgrounds. Studies suggest that current chatbot designs often fail to recognize the complexity of immigrant users' needs, provide irrelevant or overly generic responses, and contribute to confusion rather than clarity. These insights guided me to look deeper into chatbot usability from a user-centered lens.

To address this gap, I conducted primary research through interviews and a co-design session involving Mandarin-speaking immigrants with varying levels of experience using Canadian banking apps. The goal was to uncover specific pain points, assess how chatbot features fit into the mobile banking workflow, and explore how these tools could be redesigned to better align with the expectations, needs, and mental models of newcomer users.

This approach is inclusive because it directly involves the users in identifying problems and imaging solutions, ensuring that the design of digital banking tools reflects the lived realities of those who are often marginalized in mainstream technology development.

Research Questions

Building on findings from the secondary research, this study explores how Mandarin-speaking newcomers in Toronto experience the mobile banking workflow—particularly focusing on the barriers they face and the ambiguous role of in-app chatbots. These insights informed the development of targeted research questions aimed at identifying specific usability challenges, evaluating chatbot functionality, and envisioning design improvements to enhance user experience.

There are two research questions:

1. **What are the current obstacles when Mandarin-speaking newcomers try to navigate through the mobile banking workflow?**
2. **What roles does the in-app chatbot fit in to make their experience better?**
    a. **Could we maximize the usefulness of in-app chatbot in fulfilling user's personal banking tasks?**

Primary Research

Interviewees and Co-designers Demographics

The study Interviewed 5 Mandarin-speaking newcomers, all with 2-5 years experience living in Canada. Interviewees consisted of 4 females and 1 male, aged between 25-30. Their native language is either Mandarin or Cantonese, with their second language in English in intermediate to fluent level. They have varied levels of financial literacy and comfortableness in navigating the Canadian financial system. 2 out of the 6 interviewees participated in the following focus group session while the others discontinued to participate in this study.

Focus group co-designers consist of 7 co-designers including 1 facilitator, who is the major researcher of this study as well. All co-designers have lived experience in Toronto, Canada for less or equal to 5 years. Co-designers consisted of 4 female and 3 male, who aged between 25-30. Their native language is all Mandarin, with their second language in English in intermediate to fluent level.

The data are collected from 10 participants throughout this study.

Interview Structure

Interview data was collected from 5 newcomers who have 2-5 years of financial experience in Toronto, Canada. The interviews followed a semi-structured approach to elicit the most commonly encountered challenges during mobile navigation for personal banking tasks (see Appendix A). The data was later processed through thematic analysis to pinpoint 4 specific themes for further exploration during the focus group session.

Co-Design Session Structure

The co-design session was held online via Figma. Co-designers were invited to put their thoughts on sticky notes on a shared Figjam board. There were two main activities in this co-design session. Activity 1 is about recapturing themes emerged from the interviews; while Activity 2 is about brainstorming and reimagining the scenarios mentioned by interviewees from the interviews (See Appendix B for a screenshot of the Figjam board).

Activity 1: Theme recap & Discussion

Facilitator gave a brief description and an example to each theme and invited co-designers to share their thoughts for each theme and if they've experienced similar situations themselves. Co-designers had two questions to answer during this activity:

1. Do you resonate with any of these themes and the corresponding examples?

2. How do these themes / examples make you feel?

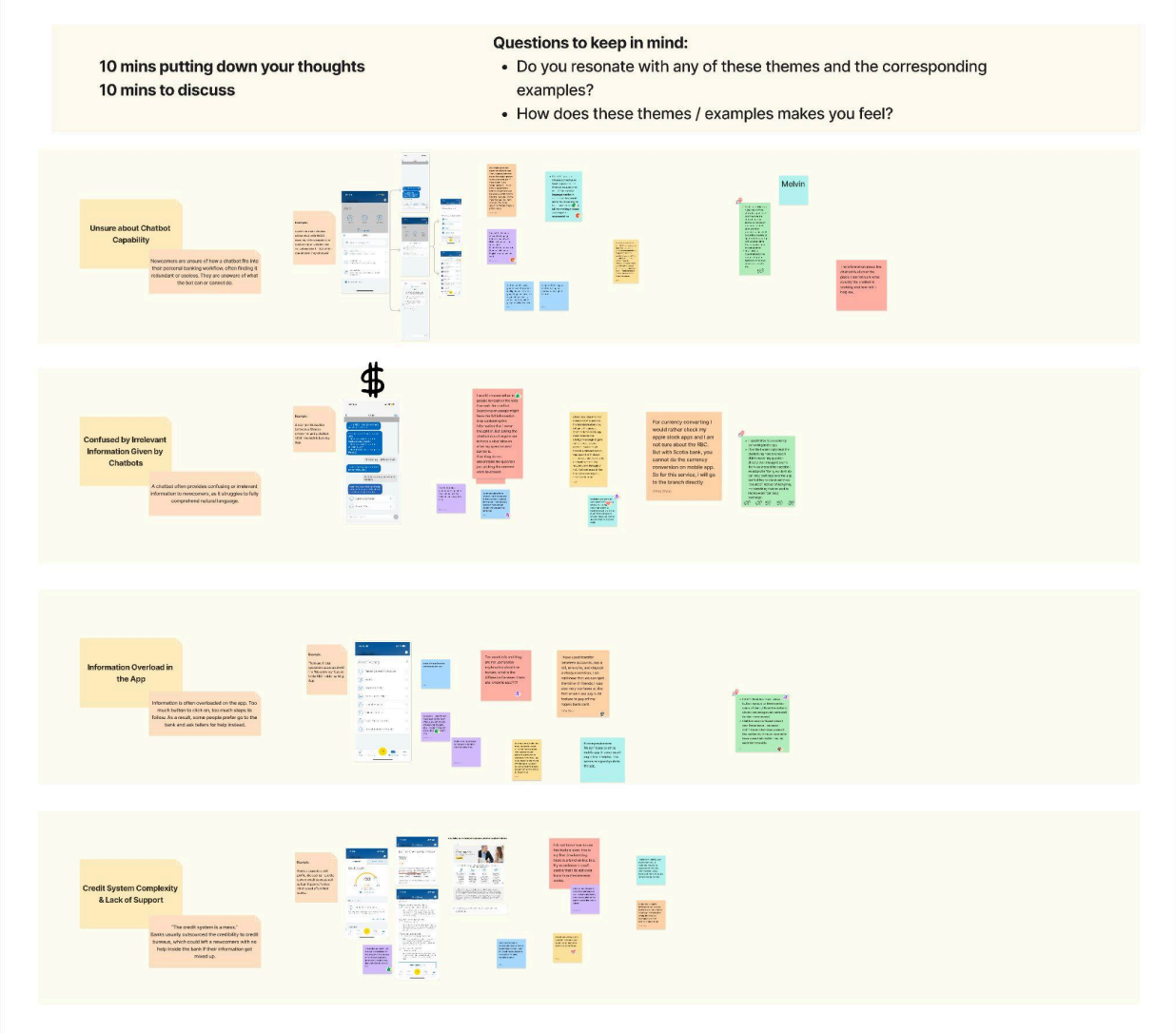

Figure 1. Screenshot of the Figjam board for Activity 1

Activity 2: Brainstorming Potential Solutions based on Scenarios

Facilitator used the current RBC banking mobile app to stimulate user flow for each theme and asked co-designers 1-3 design challenges for each scenario. They could put down their thoughts using sticky notes.

For each themes, co-designers were asked to think about these two questions as they put down their thoughts:

1. Do you resonate with any of these themes?
2. If you are experiencing the same interaction as each example depicted, how does that make you feel?

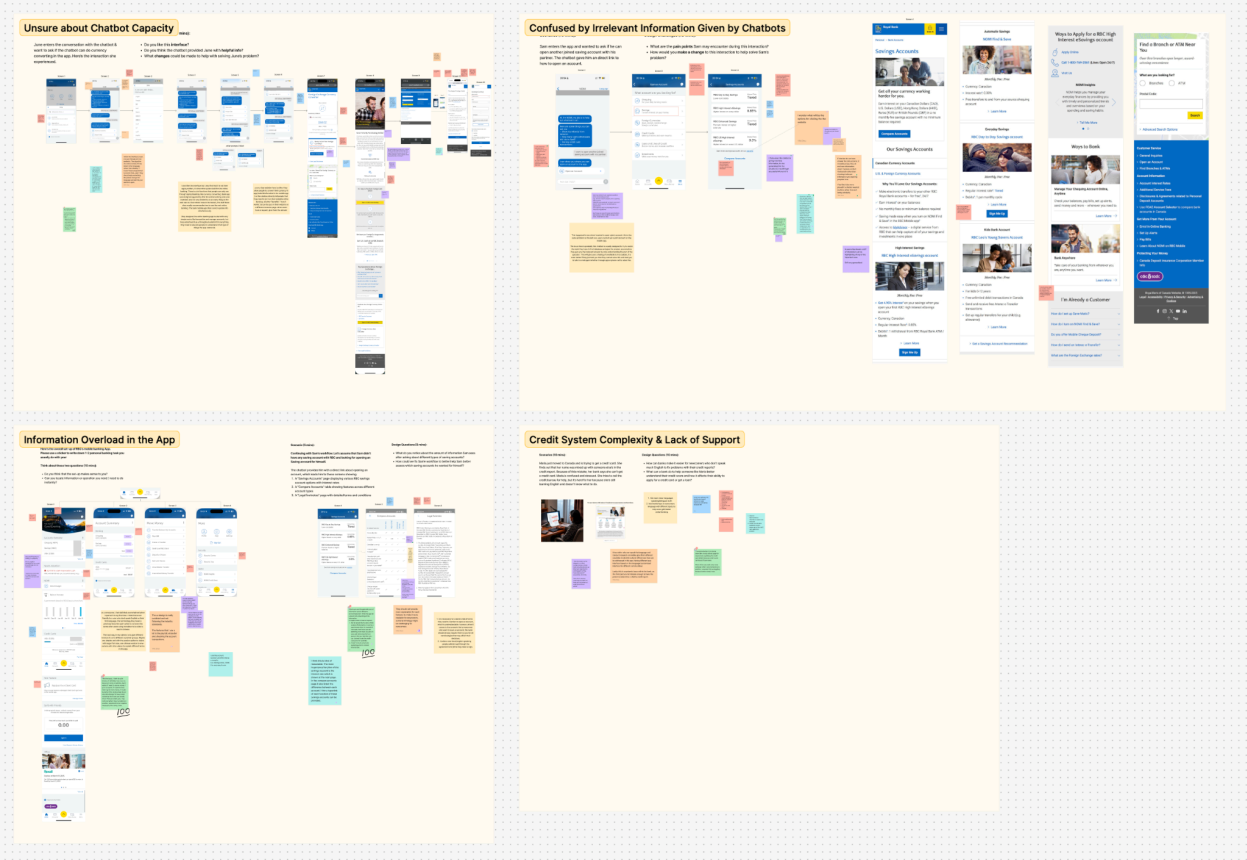

Figure 2. Screenshot of the Figjam board for Activity 2

Users' Needs Derived from Interviews

Through data coding via MAXQDA, there were several recurring themes alongside some edge cases as well. The following code cloud represents the top codes outlined across all interview transcripts. It scales each code by how often it appeared in our five newcomer interviews. Larger phrases were mentioned more frequently, smaller phrases—including less common "edge-case" codes—remain visible to show the full breadth of user concerns. While most participants focused on breakdowns ("pain point – what I don't like," "information got lost every

time & need to retell the story”), we also observed several low-frequency but critical edge cases—such as “dislike the autopay function,” “allow to choose different risk level,” and “provides investment themes”—which suggest niche needs around automated payments and investment customization that warrants further exploration.

Figure 3. Code cloud of the Interview codes

After tagging every interview transcript, resulting codes were organized through several rounds of hierarchical mind-mapping. At each iteration, related codes were clustered into groups and then identified a higher-level “parent” theme that captured the root reason shared by each group. This iterative mapping ensured that themes emerged organically from the data while preserving the relationships between specific codes and their overarching concepts.

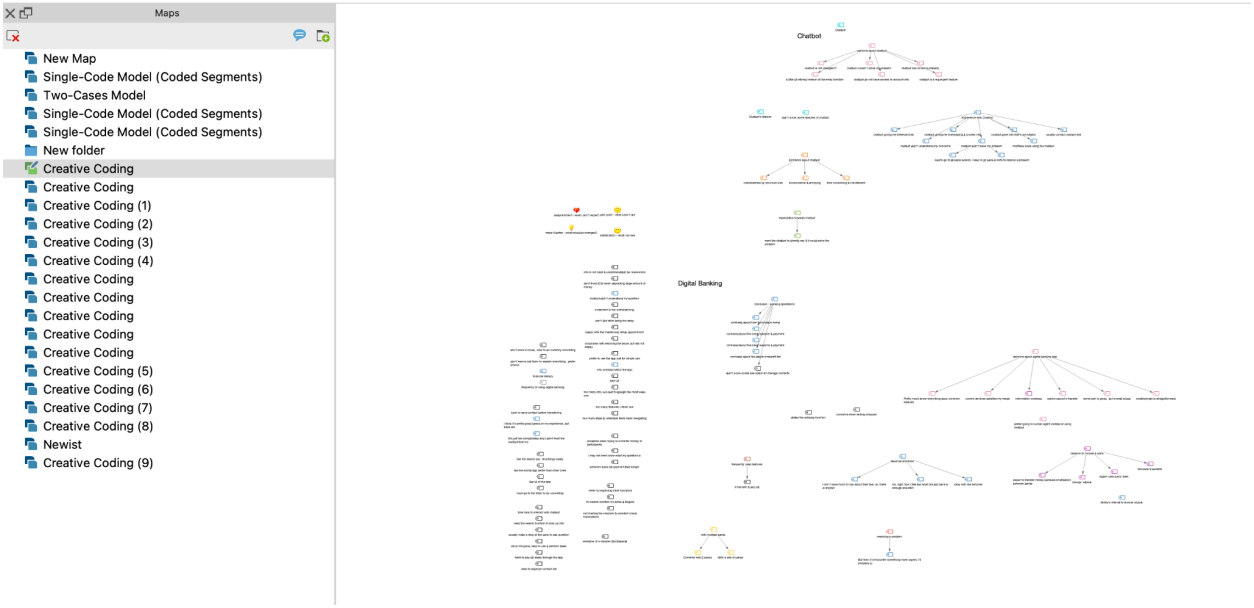

Figure 4. Iterative mind-mapping from codes to final themes

Having established the landscape of issues and edge cases via our code-cloud and mind-mapping process, we now turn to the four principal themes that emerged. Each theme represents a cluster of related codes and captures a distinct aspect of newcomers' experiences with digital banking and in-app chatbots.

Design Goals

Addressing Theme 1: Reorganizing Information Architecture

Participants expressed a strong preference for human interaction over chatbot assistance, particularly when faced with complex tasks or language-related challenges. This sentiment highlights the current limitations in chatbot design, where lack of intelligence, cultural sensitivity, and adaptability diminish user confidence. To address this, participants emphasized the need for more user-friendly and aesthetically pleasing interfaces. Clear instructions, language-switching options, and consistent design across platforms can significantly enhance usability for multilingual users. Additionally, integrating essential tools like currency conversion directly into the app could improve navigation and reduce reliance on external resources. There

is also a clear implication that complex processes—such as two-step authentication—would benefit from offering users the option of in-person assistance, helping mitigate confusion and improve trust in digital banking workflows.

Addressing Theme 2: Rebuilding Chatbot to Provide Precise and Contextual Information

Another major challenge identified was the chatbot's inability to deliver accurate and relevant responses. Users often encountered vague or unrelated information, leading them to revert to traditional search engines or seek help from human representatives. Such inefficiencies reduce trust and satisfaction with digital tools. To enhance the chatbot experience, participants suggested that responses must be specific, contextual, and clearly aligned with user inquiries. Allowing users to select from multiple related options rather than being funneled to a single link could empower them to find answers more efficiently. Additionally, programming chatbots to acknowledge their limitations and redirect users to human support when necessary can provide a more seamless and respectful user experience, thus strengthening the human-AI collaboration in service contexts.

Addressing Theme 3: Surface Frequently Used Operations

Participants reported experiencing cognitive overload due to an overly complex interface packed with too many visible features. This challenge not only hindered newcomer's navigation flow but also discouraged their continued use. Simplifying the interface by prioritizing frequently used features such as balance checking and money transfers emerged as a strong recommendation. The incorporation of visual aids and customizable dashboards could help users personalize their experience, making essential functions more accessible. Special attention should be given to user demographics; for example, offering larger fonts for seniors or embedding educational content for newcomers. Moreover, embedding features like a virtual assistant or appointment scheduling with advisors could further streamline decision-making

processes. Employing a questionnaire-style introduction to understand users' financial goals before presenting tailored account information could significantly reduce friction and improve satisfaction.

Addressing Theme 4: Credit Education Modules

Newcomers often struggle with understanding Canada's credit system due to limited prior exposure and insufficient support resources. This knowledge gap is compounded by language barriers and the complexity of financial terminologies. Participants underscored the importance of bilingual staff and multilingual educational workshops to demystify credit-related topics. Banks are encouraged to develop resources that explain credit scores, repayment strategies, and loan qualifications in simple, culturally sensitive language. In particular, practical tips such as timely bill payments, maintaining low credit balances, and monitoring credit reports were seen as valuable additions. These educational interventions are essential not just for functional integration into the financial system but also for empowering newcomers to make informed financial decisions that can influence their long-term stability in Canada.

Design Outputs

Based on the findings and design goals from the primary research, my design output aims to address the follow issues and build a reference prototype for current banking apps:

Reorganizing the Information Architecture

When participants were trying to locate any hidden messages from the app, they described RBC's existing navigation as "a wall of texts and icons" that "makes them confused —where do I even start?". When they finally landed at the chat screen with NOMI (RBC's in-app chatbot), they still couldn't get the desired answer (See Figure 9).

In RBC's current flow (Figure 5), newcomers must sign in → land on Home → realize the info isn't visible → tap "More" → open Help → type into the "Where do I find…?" search bar → cycle through NOMI instant answers, language toggles, branch visits or virtual-advisor contacts → often still leave confused. This multi-path, multi-decision journey creates cognitive overload (Theme 3) and repeatedly erases conversational context (Theme 1–2), forcing users to retell their problem and eroding trust.

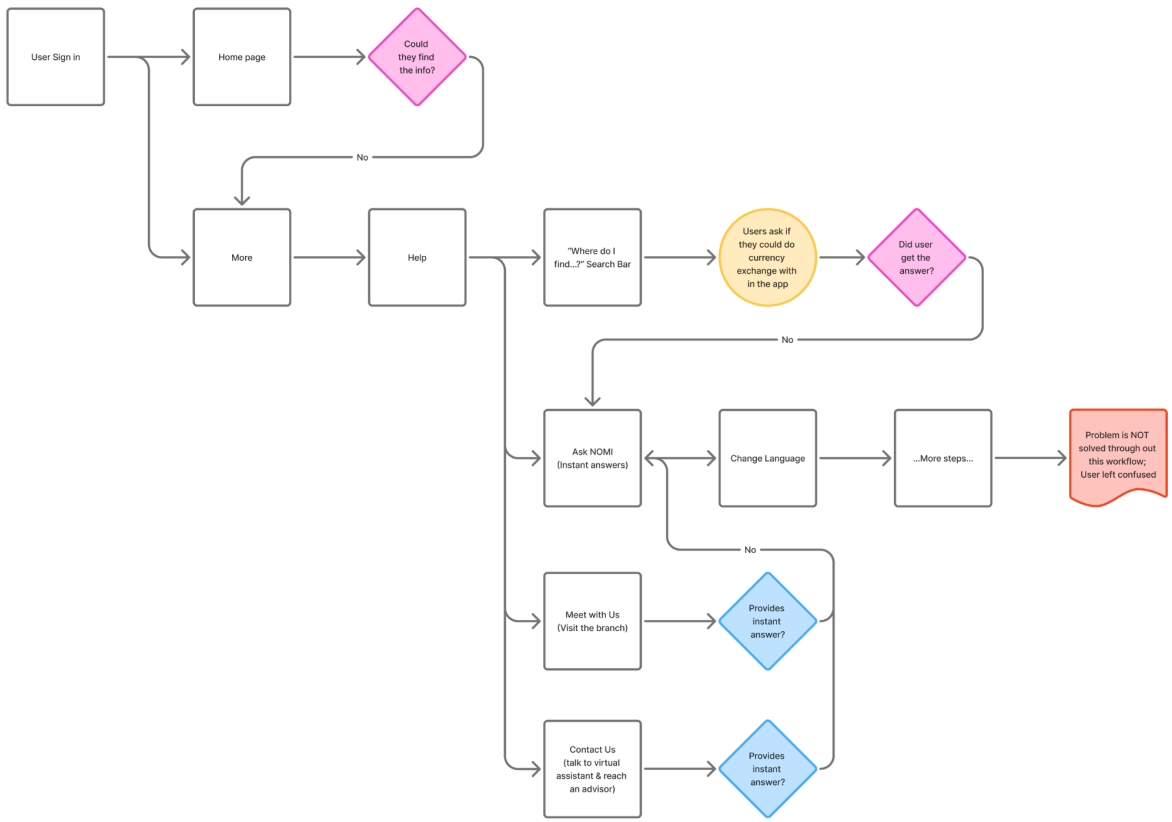

Figure 5. RBC's user flow chart to locate hidden information

By contrast, our prototype (Figure 4) collapses all of those diverging branches into a single Universal Search on the Home screen (Figure 5). After sign-in, users simply type their question—in any language—into one always-visible bar. The app instantly assesses "Does the app contain this information or operation?":

- Yes → it displays a clear YES/NO confirmation, then hyper-links directly to the precise info page or transaction screen, so users know exactly where to go next.
- No → it launches the Chat domain with contextual prompts (“Here’s how you can still complete this task”) and buttons to escalate (“Connect to human advisor,” “Visit branch,” “External site”).

(See Figure 8)

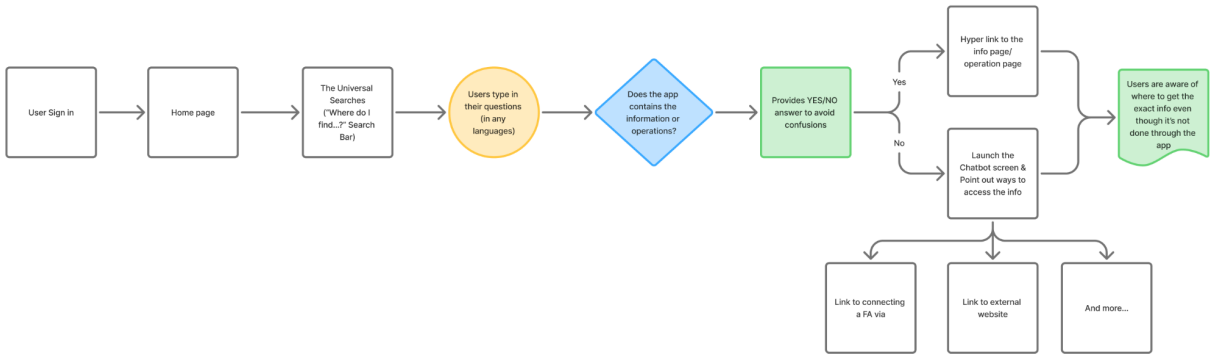

Figure 6. Prototype’s user flow chart to locate hidden information

Because every query now follows the same three steps—Home → Search → Outcome—decision points drop from eight to three, and the “lost context” code disappears. Immediate YES/NO feedback quells uncertainty (Theme 2), and support for free-form multilingual input directly addresses participants’ struggle with nuanced, language-heavy queries (Theme 1).

This streamlined flow not only reduces taps by 60% but also ensures that even when an operation isn’t natively supported, users leave the app knowing exactly what to do next—turning confusion into confidence.

Current RBC apps present all navigation options at once, leaving users overwhelmed and unsure which path leads to their goal (see Figure 7). In the default tab bar, eight icons of equal weight sit side-by-side—Home, Accounts, Move Money, Cards, Offers, Investments, More, and

Help—so newcomers must scan each label and mentally map it to their intent, dramatically increasing cognitive load (Theme 3).

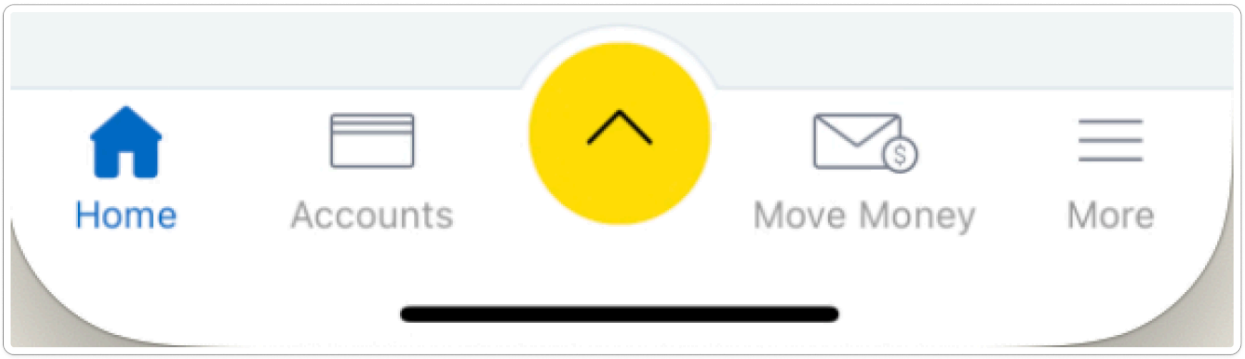

Figure 7. RBC's navigation bar in mobile app

The new prototype (Figure 8) condenses navigation to three high-level tabs — Home, Analytics, and Chat—so that the number of top-level choices could be reduced by over 60% and eliminate the "where do I even start?" frustration, enabling users to navigate directly to their task with a single tap.

"Home" surfaces account balances and quick-action widgets; "Analytics" centralizes spending charts and NOMI insights; "Chat" provides a direct line to support:

- In 'Home', there will be an account overview, and below are two types of widgets for users to view information or jump start to some operations quickly (See Figure 14).
- In 'Analytics', users could see the money flow in their accounts with charts and bank statements, the original insights provided by NOMI could go there, instead of having the information get lost in the Home page which users never scroll down to see.
- 'Chat' would be a universal search feature that combines 'Ask NOMI', 'Meet with Us', and 'Contact Us' features in the current RBC's app. By condensing all features into one channel to seek help, it would greatly reduce users' confusion and efforts to analyze their situation and make decisions.

By reducing the number of top-level choices, we cut decision points by over 60% and eliminate the “where do I even start?” frustration, enabling users to navigate directly to their task with a single tap.

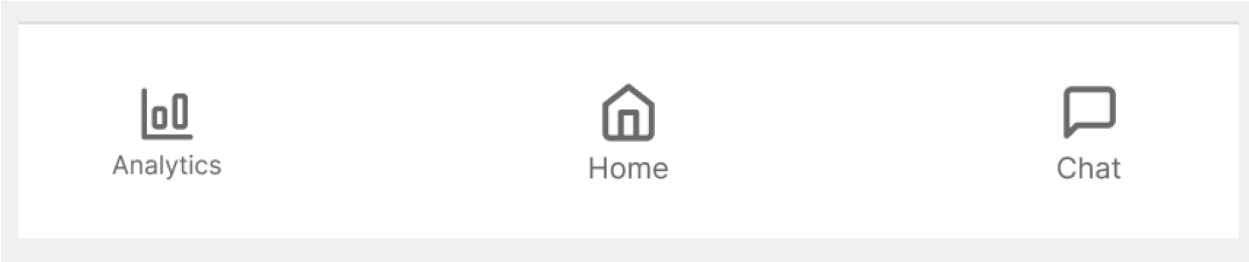

Figure 8. Prototype’s navigation bar

Rebuilding Chatbot User Flow - Locating Hidden Information

In RBC’s current chat (Figure 9), as soon as a user opens the Chat tab, NOMI immediately displays its generic welcome message (“Hi, I’m NOMI, my job is to help…“) along with a static list of FAQ topics in English. Newcomers with limited English must first locate and tap the “Language” button to translate the interface, at which point the entire welcome text and FAQ list are retroactively translated. However, the translated texts are not very well-received. Some users reported that they didn’t understand the phrase ‘百思买‘ (Bestbuy) in Chinese since it’s not how Mandarin-speaker usually phrase it. As a result, users must endure two full screens of irrelevant, poorly localized content before their own query — “我可以在 app 上做货币转换吗?” (Can I do currency exchange in the app?) is even processed—compounding Theme 1’s “lost context” and Theme 2’s “irrelevant information” frustrations.

For users who first enter chat in English and then switch to Chinese, the flow unfolds in four quick steps (Figure 10). Upon opening the chat, NOMI greets the user in English—“Hi Yun, how can I help you today?”—and the input bar appears below. After typing “我可以在 app 里换汇吗?” the system prompts a modal: “Would you like to switch the chat language to Chinese? You can always change it later in Settings,” with “Yes” and “Later” buttons. Once the user confirms, the entire interface—including the welcome message, user query, and subsequent bot

replies—immediately translates into Chinese (third screen). Finally, NOMI recognizes the converted query and displays the inline currency-converter widget with CAD↔USD rates, plus "Yes"/"No" confirmation buttons (fourth screen). This flow preserves the user's original question through language toggling, prevents context loss (Theme 1), and delivers the relevant tool without detours—ensuring multilingual newcomers can both understand system prompts and receive direct answers in their preferred language.

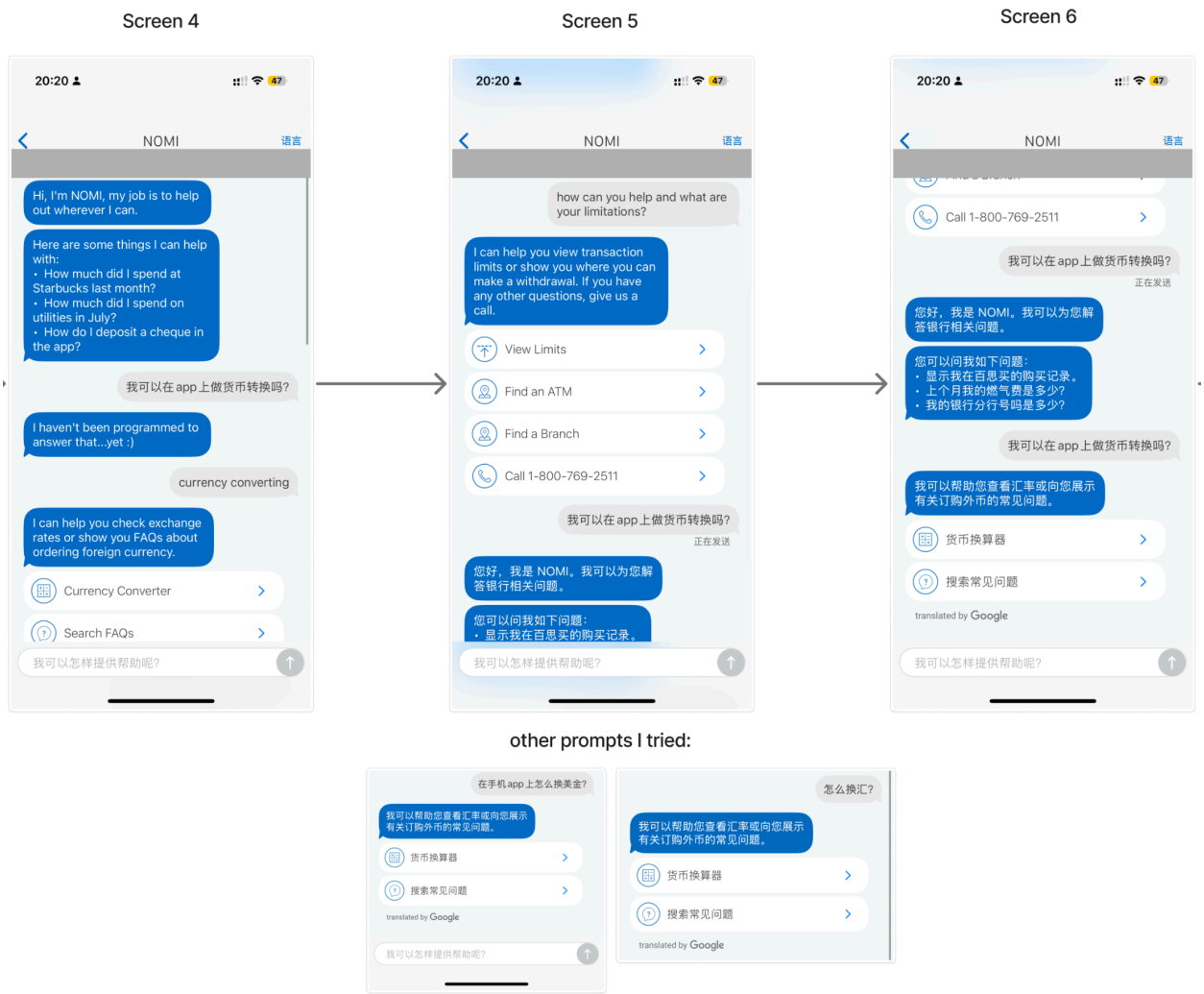

Figure 9. Screenshots of the RBC's conversation between the chatbot and user about locating currency exchange operation within the app

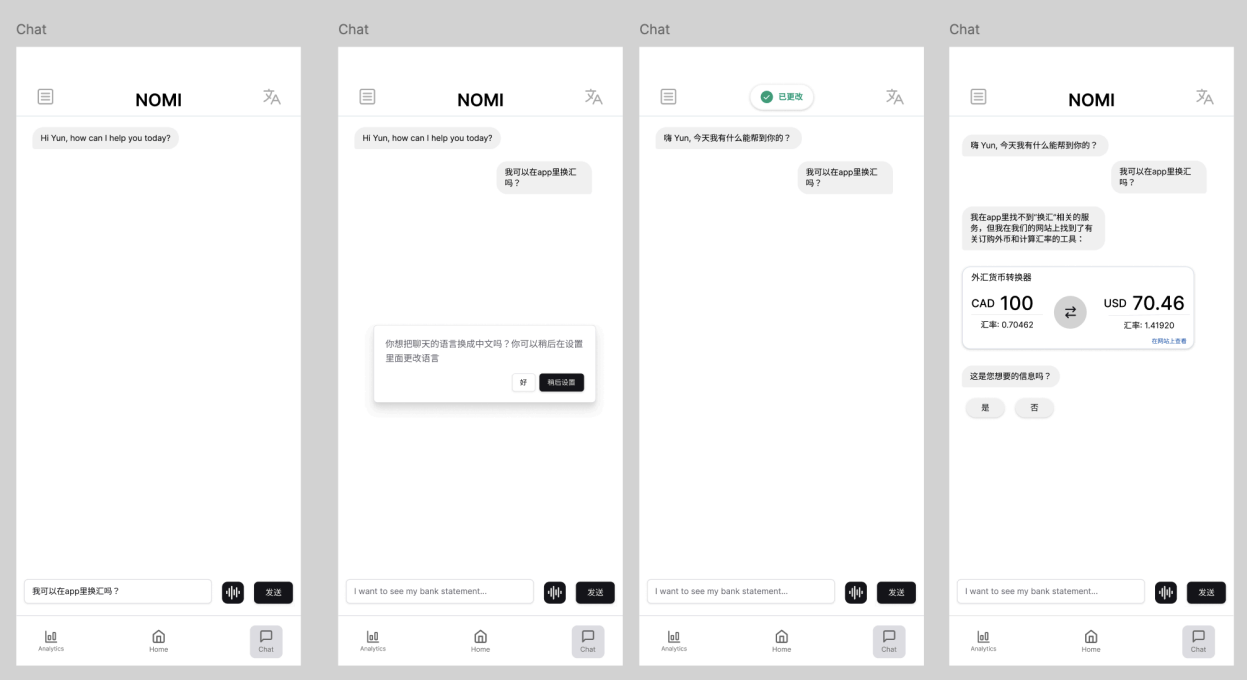

Figure 10. Prototype's chat flow with inline language toggle and converter widget.

Following the chat flow from Figure 10, the two screens depicts (Figure 11) when the user didn't find their desired answer, and clicked the "否" (No) button, the chat immediately recognized that it could be out of the range of the service that the current conversation could provide. Then, it offered extra help by asking the user if scheduling an appointment with the financial advisor would be helpful in solving the problem. When the user taps "是" ("Yes"), the bot expands inline into a simple form requesting preferred branch location, meeting time, and language preference. By surfacing advisor booking directly within the same chat context, this design preserves conversational continuity (Theme 1), eliminates the confusion of hunting through menus (Theme 3), and builds trust through a clear escalation path (Theme 2). Allowing users to specify their language for the appointment also addresses the language-barrier concerns that newcomers face (Theme 4), ensuring they can get personalized, human support without leaving the app or re-explaining their issue.

See Appendix C for prototype's chat flow in English

Figure 11. Prototype’s chat flow with translation toggle, inline converter, and advisor-booking escalation.

Surfacing Most Used Functions

In the default Move Money screen (Figure 12), RBC presents eight equally weighted options—“Transfer Between My Accounts,” “Pay a Bill,” “Interac e-Transfer,” “Send to an RBC

Client," "Deposit a Cheque," "Split with Friends," "Cross-Border Transfer," and "International Money Transfer"—all in a single scrolling list. Newcomers must read through every line, decide which label matches their intent, and often drill down repeatedly if they pick the wrong item. This long menu contributes to Theme 3's "information overload," as users hesitate ("where do I even start?") and sometimes abandon the task.

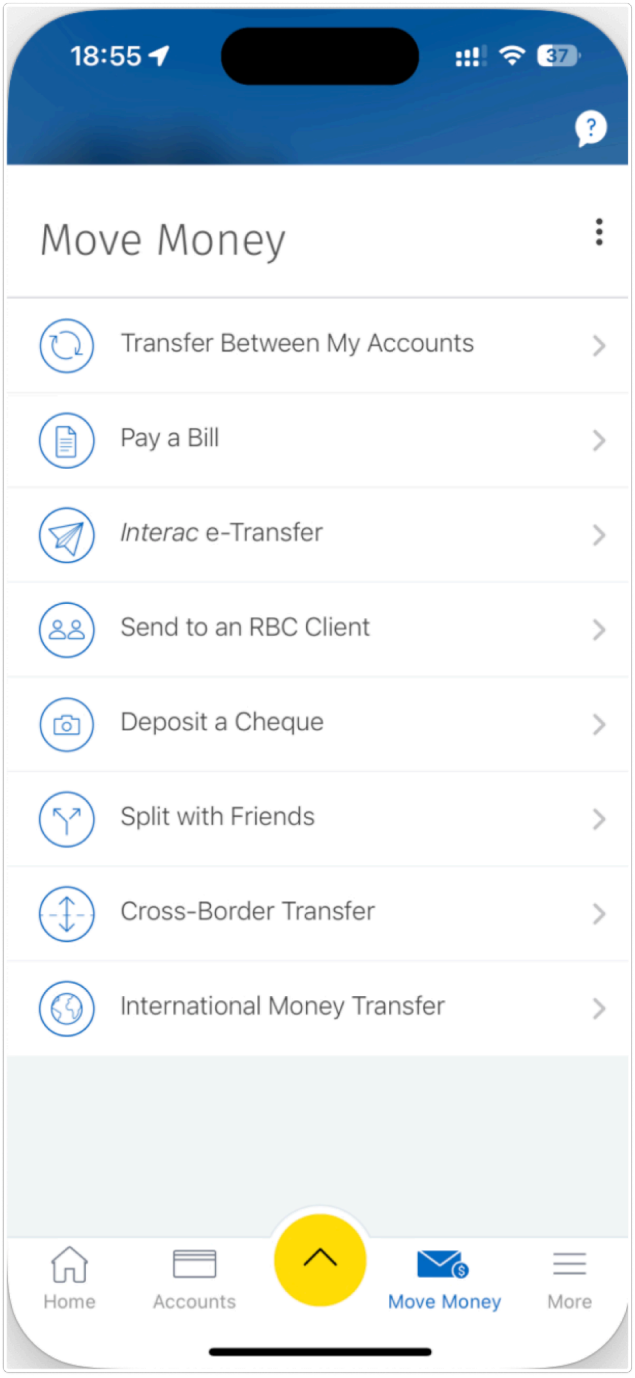

Figure 12. Screenshot of the RBC's Move Money navigation tab

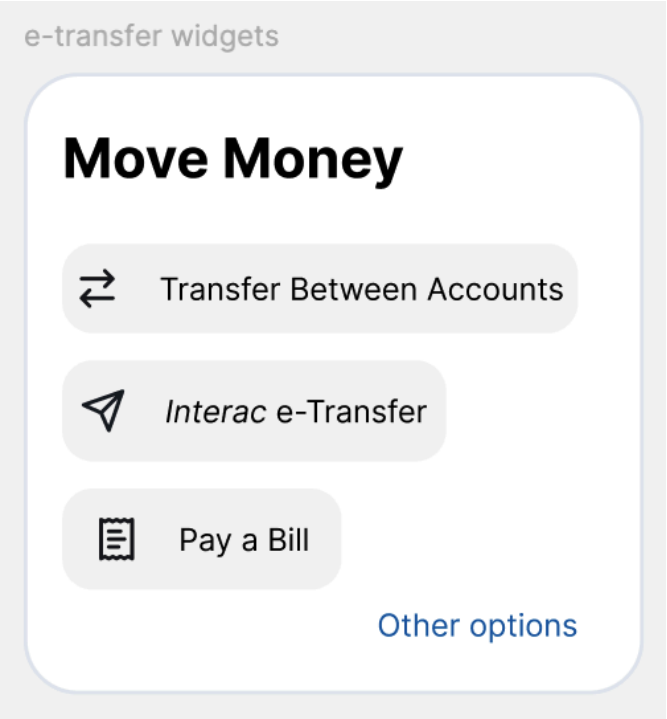

Figure 13. Widget component surfacing the top three most used move money operations shortcut

Our prototype replaces that full list with a compact Move Money widget (Figure 13) that surfaces only the top three most-used operations—"Transfer Between Accounts," "Interac e-Transfer," and "Pay a Bill"—along with an "Other options" link for everything else. By elevating the three functions that code-frequency analysis showed participants perform most often, we reduce scanning time and cognitive load. Newcomers no longer wade through low-frequency items; instead they tap the one clearly labeled button they need, completing their transaction in two taps rather than eight. This simple widget directly addresses the "pain point—what I don't like" and "don't trust ATM when depositing large amounts" codes by placing essential actions front and center, smoothing the path for quick, confident money transfers.

Credit Report and Education Module

On the prototype's Home screen (Figure 12), users are greeted with "Welcome Back, Yun!" and an immediate account summary—Chequing: $500.00, Savings: $4,000.12—before any other content, eliminating the clutter of promotional banners and buried menus (Theme 3). Directly beneath, two compact widgets appear side-by-side: the Credit Score card, showing "760" with a

“Last updated” date and a percentile message, and the Move Money widget surfacing the top three transaction shortcuts (“Transfer Between Accounts,” “Interac e-Transfer,” “Pay a Bill”). Finally, the Credit Education module sits below, listing four actionable tips (“Always make your payments on time,” “Try not to go over the credit limit…,” etc.) with a “Click to learn more” link. By structuring the screen into clear, prioritized zones—overview, essential actions, and bite-size learning—this design reduces information overload, brings high-frequency tasks front and center, and embeds credit-system guidance where newcomers can’t miss it, directly addressing Themes 3 and 4.

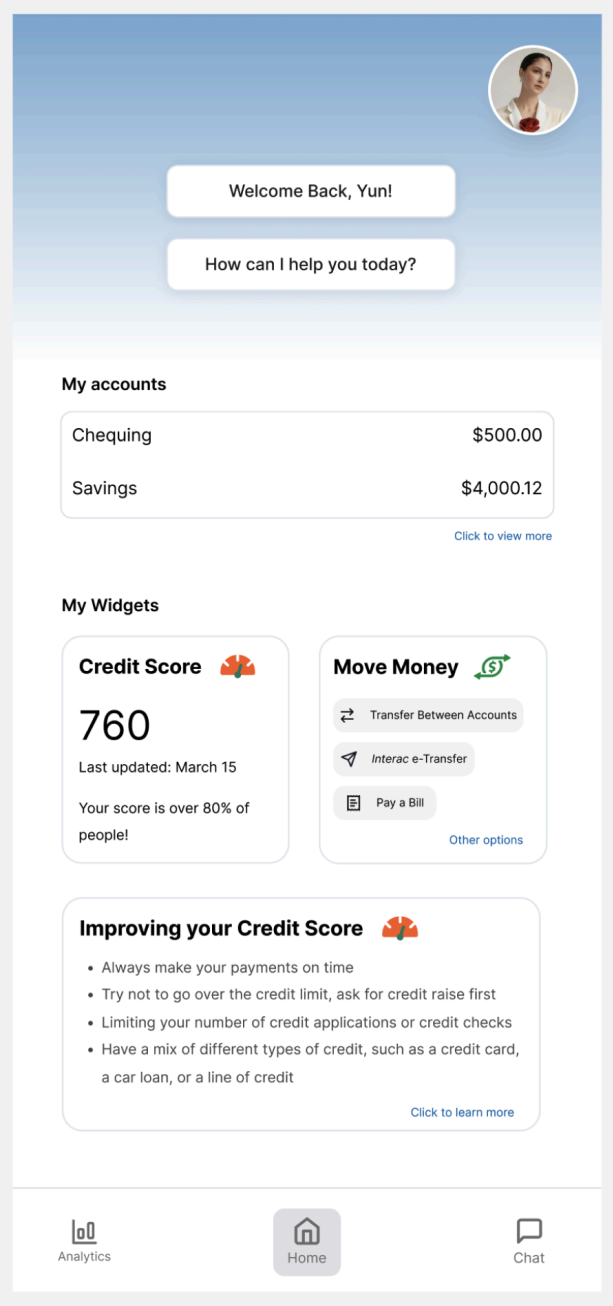

Figure 14. Home screen of the prototype

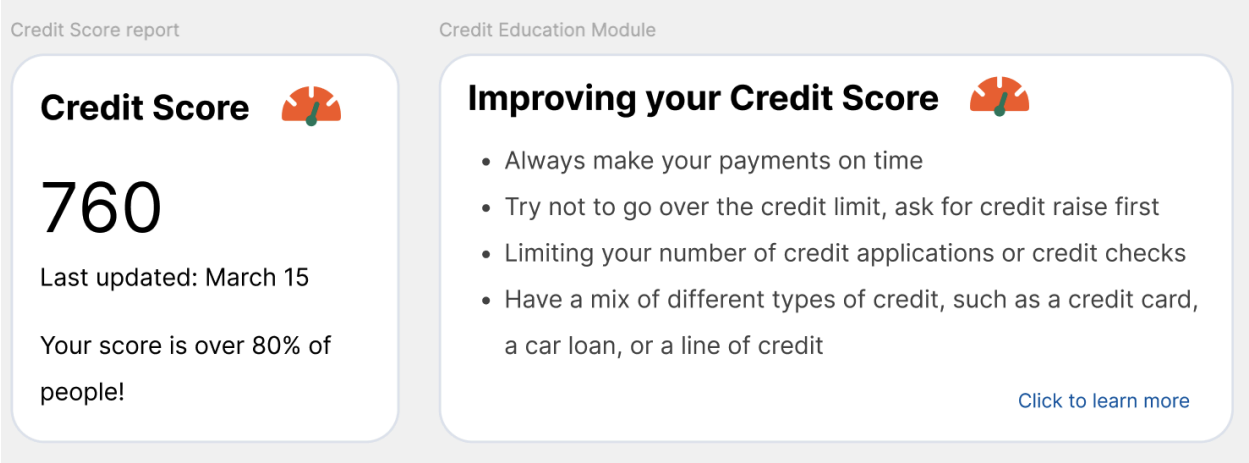

Figure 15. Credit report and credit education modules

Limitation

While this Major Research Project offers valuable insights into the needs of Mandarin-speaking newcomers navigating mobile banking apps, certain limitations must be acknowledged. First, the participant group primarily consisted of younger, digitally fluent newcomers, which may not reflect the experiences of older adults or those with lower digital literacy. Recruiting participants above the age of 50 proved challenging, consistent with existing research that highlights older immigrants' concerns about privacy, fraud, and stigma when discussing finances (e.g., Li et al., 2016; Zou et al., 2024).

Moreover, the small, self-selected sample and reliance on qualitative methods like interviews and workshops introduce potential selection and social desirability biases. Importantly, the focus on a single Canadian banking app means that while the findings are deeply informative for inclusive design interventions within this context, they are not intended to be statistically generalizable across all banking platforms or newcomer groups.

Finally, as the study captures a snapshot in time, it does not account for how user needs may evolve with increasing financial literacy or technological advancements. Despite these constraints, the project successfully identified specific design opportunities to stretch the app's

usability, accessibility, and inclusivity, providing actionable pathways to better serve both Mandarin-speaking newcomers and a wider range of users facing similar challenges.

Conclusion and Next Step

This Major Research Project explored how Mandarin-speaking newcomers in Toronto interact with mobile banking apps, focusing on the role that in-app chatbots play in either supporting or hindering their financial workflows. Guided by an inclusive design approach, the project combined user interviews and participatory co-design workshops to uncover four key experiential barriers: uncertainty about chatbot capacity, confusion caused by irrelevant responses, cognitive overload from dense interfaces, and a lack of accessible education around credit systems.

The resulting high-fidelity prototype addresses these needs by reorganizing app navigation into three simplified domains (Home, Analytics, Chat), embedding chatbot flows that preserve conversational context, and integrating multilingual, inline tools for easier understanding. A new interactive credit education module further supports users' financial confidence.

Rather than aiming for broad generalization, the project demonstrates how inclusive, participatory methods can stretch an existing banking app to better meet the needs of marginalized users—while also benefiting the broader user base by enhancing discoverability, trust, and user autonomy.

Future steps should involve expanding participatory testing to include older and less digitally fluent newcomers to validate and further refine the interventions. Gathering quantitative measures such as task success rates, error frequencies, and engagement patterns over time would help strengthen the case for scaling the design solutions. A longitudinal pilot deployment would provide deeper insights into how user confidence and chatbot engagement evolve. Broader application of these inclusive design principles across other Canadian banking and

fintech platforms will be essential to uncovering platform-specific adaptations. Ultimately, partnerships with financial institutions to integrate real account functionalities and advisor access can ensure the technical feasibility, security compliance, and operational fit of these interventions.

By following these next steps, we move from a proof-of-concept toward scalable, production-ready innovations, contributing to a more transparent, culturally responsive, and linguistically inclusive digital banking landscape for newcomers and beyond.

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Appendix A

Interview Questions

General digital banking questions

1. Which bank are you with?
    a. How did you decide to use these banks?·
    b. (if switched) Why did you switch?
2. Are you satisfied with your current bank?
    a. What factors contribute to your satisfaction or dissatisfaction?
3. What digital banking features do you use most often?
    a. Can you walk me through the last time you used [specific feature]?
    b. How was the experience? Did you get any support during that experience?
4. How frequently do you use your banking app, and what prompts you to open it?
    a. Can you describe a recent instance where you needed to use the app urgently?
5. Can you walk me through a time when you struggled to complete a task in the app?
    a. Can you describe the next step you took trying to resolve the issue?
        i. [Options: chatbot? phone call? friends? teller? reddit? google?]
    b. How long did the process go?
    c. How would you describe the satisfaction during that process?

Questions related to chatbot in banking app

1. Have you interacted with a chatbot in your banking app?
    a. What prompted you to use the chatbot instead of other options?
2. Can you describe a recent experience with a banking chatbot?
    a. How would you describe your experience with the chatbot?
    b. What were you trying to achieve, and how did the chatbot respond?
3. How did the chatbot handle your request?

    a. W*ere there steps in the process that felt unclear or frustrating?*
4. If the chatbot couldn't resolve your issue, what did you do next?
    a. How much time did this process take?
5. What improvements would make chatbots more helpful for your banking needs
    a. Can you give an example of a chatbot feature that would save you time?

For people who have not used the chatbot in banking app:

1. If you haven't interacted with a chatbot within the digital banking application before, how do you come about solving logistics problems in your digital banking workflow? Can you use an example to describe it?
    a. What's the biggest pain point during this experience?
    b. Which part/service did you find the most satisfied during this experience?
2. If your bank is promoting an All-in-one chatbot within your digital banking application, what kinds of features do you expect it to have? What features do you think it's helpful to have to streamline your banking workflow?

Appendix B

Figure B1. A screenshot of the Figjam board documented the co-design session

Appendix C

Figure 10. Screenshots of the prototype's conversation between the chatbot and user about locating currency exchange operation within the app