REPORT

Opportunities and Risks of Conversational AI for Credit Unions

Empathy and Intimacy in Automated Financial Customer Service

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Overview

As the use of digital channels continues to grow for credit unions, conversational artificial intelligence (AI) technologies provide an opportunity for improved service delivery and the potential for new service offerings such as financial advice.

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Introduction

Conversational AI technologies create new ways for credit unions to serve their members, from providing alternatives to interacting with human agents to creating new channels for more tailored financial services. They provide opportunities to build upon the trust and appreciation members place in credit unions as more human-centered, nonpredatory, and community based. But conversational AI technologies risk invading members' privacy and being frustrating and opaque.

What Is the Research About?

This exploratory study looks at existing consumer relationships with conversational AI and digital assistants, on one hand; and with credit unions, banks, and other businesses, on the other, to begin to sketch the dimensions of, and provide examples of, points within a "design space"[1] of possible financial digital assistants. While operational hurdles remain high for credit unions to deploy these new technologies, the opportunity will continue to grow in coming years.

Through ethnographic research with consumers, this report anticipates how credit union members might come to value, or reject, digital assistants. For this exploratory study, we focused on one main question: What are the implications of digital assistant technologies for how members and credit unions could *relate* to one another in the next five years?

Interviews covered three broad topics: experiences using banks and credit unions; experiences using digital assistant technologies; and reflections on the idea of a financial digital assistant and issues of privacy, trust, and potential bias. This report summarizes findings on these themes and provides insight into how credit unions could take advantage of digital assistants to improve service delivery and differentiate offerings by incorporating elements from their mission and value proposition into their digital assistants. The way forward is to develop particular product proposals and related data transparency policies that can provide members with a new understanding of what they could achieve by relating with their credit unions through "talking computers."

What Are the Credit Union Implications?

Credit unions have an opportunity to deploy digital assistants in ways that improve service delivery and member experience and provide new types of service offerings. In thinking about what types of digital assistants would provide the best fit for your credit union and member needs, keep the following research findings in mind:

- People like the promise of bots as part of a modern, organized, and simplified life.
- The realities of existing bots fall short of expectations and can limit imagination.
- People are resigned to the constant advance of technology without transparency or the ability to meaningfully opt out.
- Relations with credit unions are valued for their human element and trustworthiness, even if this means older, clunkier tech.
- The design space is complex, including diverse combinations of technologies, member needs, and business opportunities worth considering.
- The idea of talking with/through bots is becoming mundane, but credit unions could pleasantly surprise members with unique service features.
- Credit unions could tailor these technologies to show their strengths and to educate members not just about finances but also about data.

In order to create a competitive advantage, credit union digital assistants would have to not only be useful and usable but also embody and express the core values of the credit union system. By building upon these core values of empathy and respect, credit unions could focus their development of digital assistant technologies in a way that creates differentiation, even with fewer resources than are available to larger financial services providers. We use findings from our research to generate design ideas that are meant to illustrate pathways worth exploring, developing, and evaluating:

- **Build a helpful, always-accessible agent.** This kind of digital assistant could serve as the voice of the specific credit union and provide basic support but also demonstrate the "members not customers" ethos of the credit union value proposition.
- **Provide an assistant to help members maintain, augment, and monitor their personal financial support systems.**

- **Provide robot counsel.** This financial digital assistant could serve as a "second pair of eyes" as members conduct transactions with any financial services provider, intervening if necessary but always being available for reassurance or advice.
- **Connect members to each other.** This assistant would embody the credit union as a member cooperative, helping connect members to each other.

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CHAPTER 1

Introduction

Successive waves of technological development have transformed retail banking, moving beyond its historical basis in face-to-face interactions with agents at a branch office to the present landscape, in which most contact with account holders is remote. These mediated interactions take on a wide range of forms. Many still involve human agents serving customers or members over the phone, online chat, or via new platforms such as interactive teller machines. However, for a huge proportion of routine transactions, automation, including ATMs, voice telephony systems, websites, and mobile applications, has replaced human contact.

For a huge proportion of routine transactions, automation, including ATMs, voice telephony systems, websites, and mobile applications, has replaced human contact.

Conversational artificial intelligence (AI) technologies are a relatively recent addition to this technology landscape. These systems take on a variety of forms and functions and depend on successfully imitating a human agent by a simulated person, or bot. There is yet no agreed-upon or widely known name for this category of systems, a point confirmed by a number of our interviewees, though the more prominent systems are known by name:

> *I guess we tend to call those ladies by their first names, Siri and Alexa.* —MIKE, PORTLAND, MAINE[2]

For the purposes of the study, we use the term "digital assistant" as a neutral label.[3]

Conversational AI

Digital Assistants

Throughout this report, we use the phrase "digital assistants" to refer to a broad class of emergent online and mobile software technologies that interface with users to answer questions and perform tasks, including searching the internet, controlling home automation devices, and communicating with a user's contacts. Digital assistants are commonly accessed through mobile devices, smart speakers, and wearable technology like smart watches or headphones. There are three categories of digital assistants that were discussed with respondents in this study:

Automated Attendants: Also known as automated menu or interactive voice response (IVR) systems, automated attendants receive phone calls and route them or take in information and provide a response. The majority of large American corporations use these systems; however, surveys and studies suggest that they are "inferior" to live operators and the majority of callers prefer to speak with people.[4] The "callback" function, in which an automated attendant arranges to call the user when a live human agent is available, is considered a major improvement to this technology.

Chatbots: Chatbot software facilitates customer service assistance to users through online text chat boxes. More simplistic chatbots filter input based on keywords to provide generic replies, whereas more sophisticated chatbots use AI and natural language processing to simulate a conversational response. While some chatbots are merely a text box, some are built around a "persona" that is offering assistance, such as Amazon's Lex or IBM's Watson. Our respondents are broadly open to using chatbots and find them accessible and convenient for seeking specific information in response to simple questions. Within financial services, banking institutions are increasingly developing their

own persona-based chatbots, sometimes also referred to as virtual financial assistants. Prominent examples include Bank of America's Erica, Capital One's Eno, USAA's Nina, and Ally Bank's Ally Assist. Two of our respondents have used Erica.

Virtual Assistants: Also known as "voice bots," virtual assistants are able to converse with users to perform tasks ranging from answering questions, making phone calls, setting reminders, playing music, and searching the internet for information. Examples of virtual assistants include Apple's Siri, Amazon's Alexa, and Google Assistant. All of our respondents are familiar with these systems, and one has used Samsung's Bixby.

Conversational AI technology dates back to the 1960s. ELIZA, a text chatbot that impersonated a Rogerian psychotherapist, was an early and surprisingly compelling example, using very simple keyword-spotting and text-manipulation algorithms.[5] At the same time, popular television shows like *Star Trek* and movies like *2001: A Space Odyssey* familiarized and intrigued the public with the idea of conversing naturally with computers. The first experience the general public had with actually talking with an automated agent was in the 1980s with the introduction of phone-answering systems that played prerecorded audio and accepted touch-tone (and later limited voice) inputs. Simple text-based chatbots became widely used in e-commerce contexts in the 2000s with more sophisticated language-understanding bots arriving in the 2010s, including financial assistant bots such as Erica, Eno, Nina, and Ally Assist. The 2010s also saw the commercialization of what is now considered proper "conversational AI." Based on sophisticated cloud-based, data-intensive speech-understanding algorithms created using machine learning, these "virtual assistants," such as Siri, Google Assistant, and Alexa, became well known through advertisements and word of mouth even by people who did not use them.

Digital assistants take on many different forms, for example, using input-output mechanisms as diverse as phones with keypads, screens with keyboards and pointers, and hands-free two-way audio. Their corresponding business goals range from reducing the need for human agents to monetizing futuristic aspirations of a modern digital lifestyle. What unifies this complex design space is the notion of conversing with an ostensibly helpful digital assistant, a kind of robot or artificial person. This is compelling in terms of both human-centered design and cultural understanding. From a design perspective, natural language interfaces leverage people's expertise in interacting with one another through spoken or written language, promising a democratization of access to sophisticated computing systems for everyone. And with fictional roots dating back at least

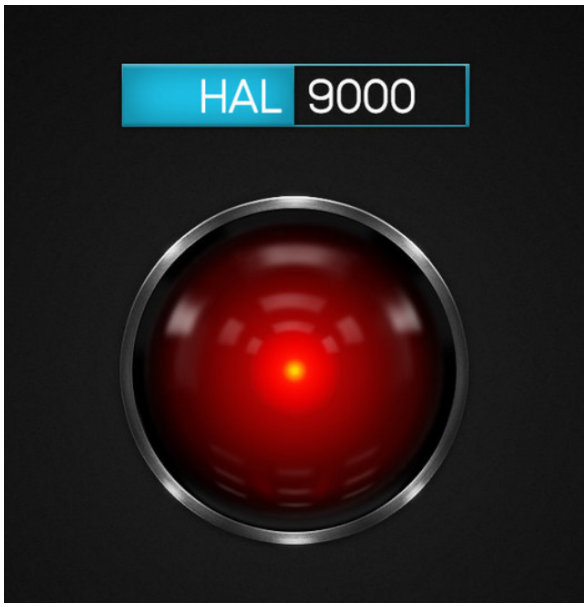
to the middle of the last century, the figure of the talking robot can be taken for granted as culturally familiar and part of futuristic imaginations.

What unifies this complex design space is the notion of conversing with an ostensibly helpful digital assistant, a kind of robot or artificial person. This is compelling in terms of both human-centered design and cultural understanding.

This central design idea of conversing with automation also has negative associations. Actual systems seldom live up to the promise of natural interaction and helpfulness, as on *Star Trek*. And though these systems are not imagined to have the maleficence of, say, Hal 9000 in the film *2001: A Space Odyssey*, the idea that robots are not necessarily trustworthy, transparent, or helpful is also part of common cultural understanding (Figure 1).

FIGURE 1

HAL 9000 FROM *2001: A SPACE ODYSSEY* (1968)



Source: "Illustration of the HAL 9000 computer case, based on Stanley Kubrick's film *2001: A Space Odyssey*," by Michael Melchinger, commons.wikimedia.org/wiki/File:HAL9000_Case.svg. Creative Commons License (CC BY-SA 4.0), creativecommons.org/licenses/by/4.0.

Erica and Alexa

As prominent examples of digital assistants, consider Bank of America's Erica and Amazon's Alexa. Figure 2 shows some dimensions of difference.

Erica is an online chatbot, accessed without cost via Bank of America's website or mobile app (once a user has logged in to a session). Primarily text based, Erica assumes users can focus their attention on a screen, as she often presents clickable links in query responses and as suggestions for interaction. Instead of typing, users can speak to Erica by clicking a microphone icon, in which case Erica converts voice to text and then reads her response in addition to displaying it on screen. An often useful side effect of Erica's textual basis is that each session interacting with her generates an on-the-record transcript.

FIGURE 2

DIGITAL ASSISTANT EXAMPLES *ERICA* AND *ALEXA*

Erica	*Alexa*
Bank of America, 2017	Amazon, 2014
Text chatbot, voice optional	Voice-centric virtual assistant
Bank of America app or website	Echo smart speakers, or many other devices
Requires online banking login for each session	After setup, no login required, can distinguish multiple voices
Addressed via text box or voice-to-text button	Addressed by name (always listening for this "wake word")
Positioned as free benefit to help Bank of America customers manage their finances and credit scores	Positioned as fun, useful, general-purpose artificial intelligence for home life; over 50,000 "skills," home automation

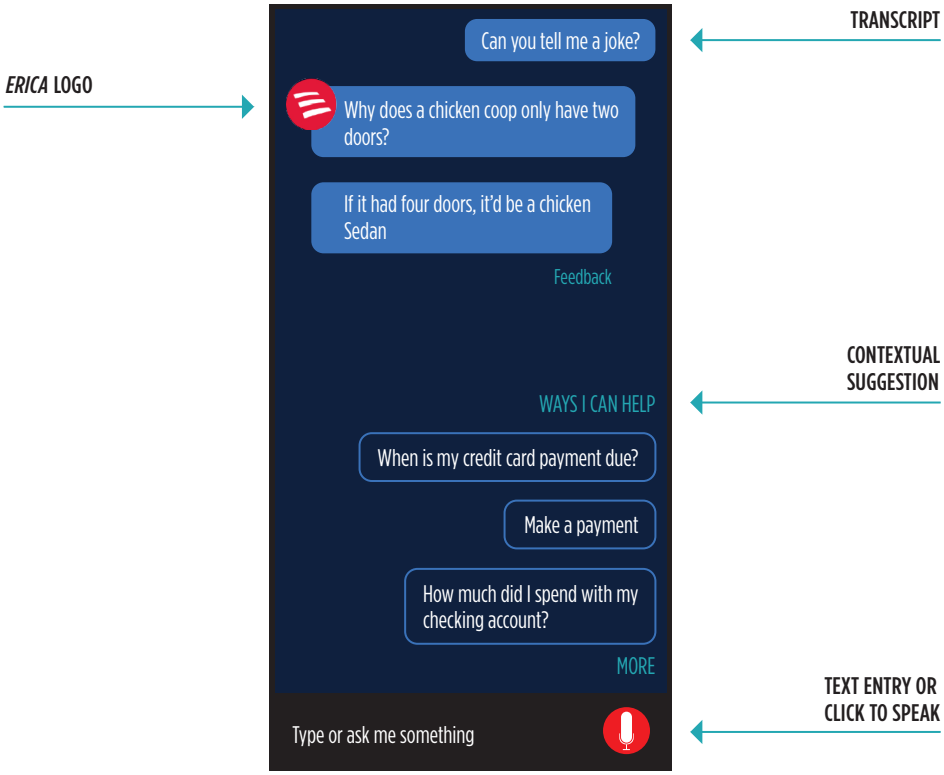
In posing as a person, Erica speaks in the first person, often referring to herself and her abilities: for example, claiming that "I am better than a chatbot" and "I use advanced technology." Erica has a distinctive voice (but only when spoken to) and is programmed to meet now-common expectations for some playful behavior (Figure 3). Although she has a human name, the last five letters of *America*, she rarely uses it and has no corresponding visual representation, only an abstract three-line circular logo. In some circumstances she hands off conversations to live agents, presenting herself as a peer of Bank of America's call center agents.[6]

Erica's positioning is nuanced. She is both a servant and an advisor. She provides self-service access to online banking through a natural language interface but also, for example, advocates attending to and improving one's credit score. She is designed to be used in discreet, secure, logged-in sessions, rather than as a kind of constant presence. Erica is not particularly salient in the app's home page: of the few research participants who had the app on their phones, none were able to bring up Erica easily during our conversations. Although she is available 24/7 on smartphones, it takes some effort and intent to access her.

Amazon's Alexa has many similarities to Erica. But in addition to having much broader functionality, including home automation and connection to over 50,000 third-party apps ("skills"), Alexa encourages much more conversational interactions. Alexa is an

FIGURE 3

ERICA INTERFACE ON BANK OF AMERICA'S iOS APP IN LATE 2020



always-listening, voice-based, hands-free system, designed primarily for Wi-Fi–connected home "smart speakers," such as the $25 Echo Dot. Interacting with Alexa is a generally disembodied, social experience. By contrast, interacting with Erica, which is enclosed within a specific, screen-based mobile app or website, feels much more transactional, formal, and customer service oriented.

Alexa's openness is a blessing and a curse. It allows Alexa to *inhabit* space and invite spontaneous interaction but also creates persistent difficulties in correctly understanding spoken input and in conveying her abilities and limitations. This openness also requires user acceptance of the inherent creepiness of constant surveillance and the possibility of unwanted activation and connection. In addition, Alexa has a less obvious relationship with her corporate master, Amazon, than Erica has with Bank of America. Amazon has been careful to downplay Alexa's abilities to sell Amazon products and services, instead positioning her in a semiautonomous zone within Amazon's empire, providing an open-ended and "cool" tech experience. (Bank of America has similarly refrained from using Erica for obvious self-promotion and product sales, though these ties to the bank's interests are intrinsic and don't need to be trumpeted.)

As these two examples suggest, successful products within this design space require a substantial investment in user experience (UX) research and design, guided by clear business goals and design principles. They suggest that, by building upon the core values of empathy and respect that are central to the credit union system, credit unions could focus their development of digital assistant technologies in a way that gives them a competitive advantage, even in the face of greater resources available to large banks and tech companies. For virtual assistants, this may require partnering with major platforms like Amazon via the "skill" concept; for less conversational systems, more stand-alone products like Erica could be more viable. Regardless of how they are technically realized, in order to create a competitive advantage, credit union digital assistants would have to not only be useful and usable but also embody and express the core values of the credit union system.[7]

By building upon the core values of empathy and respect that are central to the credit union system, credit unions could focus their development of digital assistant technologies in a way that gives them a competitive advantage, even in the face of greater resources available to large banks and tech companies.

The Twenty-First-Century Credit Union

In developing background for our research, we spoke with a number of credit union professionals and surveyed material regarding future directions for the credit union system, for example, the 2019 Filene Research Institute report *The Credit Union of the*

Twenty-First Century by Taylor C. Nelms and Stephen C. Rea.[8] We found that a common aspiration for technologists and strategists was for credit unions to move beyond their core mission of retailing financial products such as checking and savings accounts, auto loans, and mortgages to serve more holistically and continuously the financial needs and aspirations of members by providing customized financial advice and promoting norms of financial "health" or "wellness." Such a shift would entail making more and better use of data that credit unions have or could have about the circumstances, behaviors, and needs of their members, for whom, not surprisingly, machine learning–based AI was seen as an important enabling technology. From this perspective, deploying digital assistants based on conversational AI could be an important means to this end.

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As part of this background research, we attended two webinars sponsored by *American Banker*, "Using AI to Personalize Customer Engagement,"[9] featuring Lori Murray from DXC Technology and Lou Aronson from Discourse Analytics, and "AI and Beyond: What Banks Can Learn from Retailers to Boost Customer Acquisition,"[10] featuring Rahim Kaba of integrate.ai and Peter Wannemacher of Forrester. In both webinars, the value of AI for banks was presented in terms of persuasively delivering the right message at the right time to maximize conversion or other desired behavior, based on personalized inferences drawn from detailed, recent data about the recipients—data often collected without their knowledge.[11] In the customer engagement presentation, chatbots were lauded as channels both to present targeted messaging and to gather data for this targeted messaging. Data gathering could be implicit, from measuring the response to messaging in terms of timing, word choice, strength of reaction, etc., or explicit, from using the chatbot to ask questions or to present brief surveys for the purpose of probing preferences and attitudes. Possible negative consequences of people becoming aware of the degree to which data were being collected and used to "nudge"[12] their behavior were not acknowledged in either webinar.

From discussions with credit union professionals, we understand that for most credit unions, deploying digital assistants beyond the level of automated phone attendants has, understandably, been neither easy nor urgent. There are significant operational hurdles to

overcome to create the foundations for future development in this area. Our study, then, is prospective. In thinking about implications of these technologies as they will exist in the coming years, we hope to provide some help in anticipating how members may value or reject them, as well as highlight the distance between current understanding and experiences and the enticing scenarios credit unions are starting to form for their future.

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Research Questions and Participants

For this exploratory study, we focused on one main question: What are the implications of digital assistant technologies for how members and credit unions could *relate* to one another in the next five years? By *relate*, we mean something more long-standing than *interact*: we mean how one incorporates another into daily life, both practically and psychologically.[13] In our methodology and analyses, we broke this main question into more specific aspects:

- In what ways do members relate to existing digital assistants?
- How do members relate to credit unions, banks, and other financial service providers?
- In terms of relationships, what are the risks and opportunities for credit unions in adopting digital assistants?

For this study we adopted an ethnographic approach, seeking to understand the lifeworld of our participants, including their routines, experiences, beliefs, and attitudes. We intended to conduct in-person interviews, ideally in people's homes. However, after the first two, because of the COVID-19 pandemic, we switched to remote video interviews.[14] For this qualitative methodology to work, rapport, informality, and mutual trust between researcher and participant were paramount. We sought a diverse and insightful set of interviews, rather than a representative sample. We probed for emotions, attitudes, and stories, rather than a comprehensive survey of usability or other issues with particular financial institutions or existing digital assistants. (Future research that, for example, explores the usability, use, branding, customer segmentation, and business implications of just one financial digital assistant, such as Bank of America's Erica, would be worthwhile though would likely require the buy-in of particular stakeholders.)

We conducted one- to two-hour one-on-one interviews with 11 credit union members living in the urban or suburban areas near Los Angeles, California; Boulder, Colorado; Dayton, Ohio; and Portland, Maine. All had used some variety of digital assistant. Ages of the interviewees ranged from early 20s through 50s, with a mix of renters and homeowners; and a mix of people living alone, with roommates, or with family members (some of whom were children). Many were office workers (including some still able to work in office buildings in the midst of the COVID-19 pandemic rather than at home), in addition to two university students, a contract employee recently laid off from a full-time job, an airline agent working at an airport, a paramedic, and a person having multiple part-time jobs, including hairstylist and childcare provider. Six participants were people of color (two immigrants from Asian countries and four African Americans), and five were white. Most participants were recruited opportunistically by following social ties of the researchers and their friends. To include members from underserved communities otherwise beyond our reach, we partnered with Wright-Patt Credit Union, who graciously agreed to distribute flyers at selected branches in Dayton, Ohio, to advertise and endorse the study. Each research participant gave informed consent, as required by the human research policies of University of California, Irvine, and was given a $75 gift card in appreciation for their participation.

Interviews covered three broad topics: experiences using banks and credit unions, particularly regarding customer service interactions; experiences using digital assistant technologies, focusing on voice-based virtual assistants but also probing chatbot use; and reflections on the idea of a financial digital assistant and issues of privacy, trust, and potential bias. We encouraged participants to relate relevant stories and to reflect upon both positive and negative experiences, and why they had the reactions they related. Our goal was to be able to infer from their responses, explicit or implicit, their answers to questions such as: How do you feel about talking to bots versus people? What makes you feel understood and respected? Conversely, what makes you feel disrespected, frustrated, or lacking choice? What anxieties arise when you think about finances and technologies? What do credit unions and other companies know about you? How might you relate to future AI systems?

Interviews covered three broad topics: experiences using banks and credit unions, particularly regarding customer service interactions; experiences using digital assistant technologies, focusing on voice-based virtual assistants but also probing chatbot use; and reflections on the idea of a financial digital assistant and issues of privacy, trust, and potential bias.

We summarize key themes that emerged from the three parts of the interviews in the following chapters and conclude with design principles and promising directions.

Relating with Bots

Part of a Modern Lifestyle

Participants have generally favorable attitudes toward interacting with bots, though there is little enthusiasm for these technologies. Although chatbots and virtual assistants were interestingly novel—even trendy—technologies in the mid-2010s, their novel charm apparently has worn off. Smart speaker products for the home, like Amazon Echo or Google Nest, are often a mundane part of home life for middle-class or younger members in our study. They are appreciated, often for a small set of recurring tasks such as playing music, setting timers, or googling quick questions, but they are not considered essential. For members of lower socioeconomic status, they are also seen as a desirable addition to the home environment and have either been purchased or are going to be purchased when members' budgets allow. Every one of our study participants has seen or heard these products in use, if not in their own home, then in the homes of friends or family.

All interviewees use Siri or Google Assistant on their smartphones, particularly as a hands-free or text-input-free interface when driving; these are indeed seen as essential tools enabling constant smartphone availability for participants who lead a busy, mobile lifestyle.

One participant in his early 20s proudly said that he thinks these conversational interfaces are pointless. When virtual assistants first came on the scene, he and his teenage friends thought they were cool and futuristic. Now they just get in the way of getting stuff done online; directly accessing websites and programs through typing and clicking is faster and more accurate. One example of enthusiastic teenage use comes from an interview with a father of a teenager who saved up his earnings doing odd jobs to buy his own Amazon Echo for playing music and having fun with; the father, who had not had much interest in such gadgets, was inspired to get a couple for himself, primarily for on-demand music, particularly for accessing songs from his youth.

Suspension of Disbelief, Intimacy, and Forgiveness

What is it like to interact with a bot? In many ways it is like entering into a game of pretend, in which one suspends disbelief that the bot is actually just some lines of software, in order to treat it as a person and so receive its benefits. The bot asks you to go along with the conceit that it is a person, promising in return to assist you in an easy and flexible way. When it works, you are rewarded twofold: your request fulfilled or your entertainment

obtained and the satisfaction of a productive conversation, in which the reality that you are operating a machine fades away almost completely.

The illusion of relating to a person can be quite convincing. As one participant said:

> *I feel that Siri . . . her voice fluctuates sometimes, it can go up, sometimes it goes down, it's almost like you're talking to somebody. And with Siri sometimes like you end up having a conversation with Siri, 'cause I can be like, "Hey, Siri," especially when I'm driving I'll be like, "Siri, send a text." And she'll be like, "What would you like it to say?" And like you talk back to her and she's like, "Are you ready to send it?" And you're like, "Yeah." And she's like, "Message sent."* —JAMAR, DAYTON, OHIO

Another interviewee, when asked to imagine Alexa as a person, said they see a polite, friendly, smart, patient, and professional young white woman. In enacting this character, the system encourages mirroring it in certain ways. For example, since Alexa uses clearly articulated and proper slang-free English, she puts mostly subliminal pressure on listeners to speak accordingly. This could be a problem, or at least require extra effort, for people who speak with an accent that Alexa cannot understand or who have to exert themselves to speak to Alexa in an unnatural way. As has often been reported in studies of these systems, some participants report saying "please" and "thank you" to reciprocate Alexa's polite manner, despite knowing full well she is just a digital assistant. This designed sociability enables the systems to enter into rather intimate relationships with their users, with smart speakers being invited into even private areas of the home such as bedrooms and bathrooms, and smartphone accessories such as wireless earbuds broadcasting voices in our heads.

Treating virtual assistants as if they are real people has a dark side, as some users obtain some mean-spirited satisfaction in swearing at or otherwise disrespecting them or tricking them into saying obscenities. None of our participants report engaging in such misbehavior, though it is actually prevalent enough among Alexa users that Amazon took steps, for the sake of discouraging misogyny and bullying, to have Alexa identify and politely object to such treatment, including pretending not to hear it.

This suspension of disbelief can come crashing down in disillusionment when the limits of the technology become apparent. Participants from our study complain of not being understood, having to repeat themselves, and needing to learn work-arounds to get the virtual assistant to do what they wanted it to do. Additional problems include the virtual assistant misunderstanding them and therefore replying bizarrely, being oblivious to context, unexpectedly activating through false detection of a wake word, and generally acting unlike any human would—revealing its robotic nature. But, somewhat surprisingly,

people are fairly forgiving of these failures; they complain about them, but most are still generally positive about these technologies and their usefulness.

Suspension of disbelief does not mean abandoning reality. Outside of a few examples, conversational technologies are not trying to trick people into thinking that they are actually people.[15] In this way these systems enjoy the best of both worlds: people treat them as people, especially when they work well; and people treat them as machines when their limitations are apparent, or when it is convenient to do so. These systems are designed to encourage both of these scenarios. They discourage high expectations by making their limitations and nonhuman nature fairly apparent and by not requiring complete sentences or politeness, while inviting their users to treat them as real people, shaping users' behaviors, and rewarding them when they play along with the fiction.

These systems enjoy the best of both worlds: people treat them as people, especially when they work well; and people treat them as machines when their limitations are apparent, or when it is convenient to do so.

This balancing act of both being and not being a person will become more precarious as these technologies move into more consequential areas such as banking and financial advice. Though these systems will still encourage users to suspend disbelief to enable "natural" interaction, people will be much less forgiving of unexpected or unreliable behavior when money or reputation is at stake. A financial digital assistant should encourage its client to treat it as a trustworthy and professional agent to function seamlessly, but not so much that users grant it irresponsible and unwarranted levels of trust and functional expectation. Establishing this delicate balance will be an ongoing and application-specific question for system designers.

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Loyalties and Roles of Bots

Agents, whether human or robot, raise the question of whose interests they are serving: the person interacting with them (customer, client, member, etc.), the enterprises or institutions they represent, or themselves. In the case of human agents, it is a mixture of all three; disputes

can be a subject of legal or ethical arguments regarding the agent's dual obligations to their employer and to their client. In the case of bots, and to some extent with an agent over the phone, people can also regard them as tools without any real agency—inanimate objects incapable of loyalty, controlled dispassionately by code. In conversations with our research participants, all four ways of regarding the loyalties of digital assistants surfaced.

Regarding automated phone attendants or chatbots, participants see them primarily as acting on behalf of the businesses that deploy them—often as barriers or gatekeepers between them and the human agent they want to talk to, as indeed they were designed to be. But with virtual assistants, and even with phone attendants or chatbots, participants also see them—at least in part—as trying to be helpful and as on their side. Virtual assistants in particular are seen as servants whose job is to do what they are told, literally answerable to their users, not to Apple, Amazon, or Google. It is also clear that participants see each artificial persona as wanting to do things its own way and/or as inflexible, inanimate software such that effective use would be a learned skill. No one said they experience these systems as learning and therefore getting better and more usable with time; any responsibility to learn to make interactions go more smoothly is placed on the user, not the system.

As with human agents, people understand that the loyalty of digital agents is a mixture of different factors. For example, one respondent reflected on a recent call to her provider to check the status of a reported problem. An automated attendant took her call and asked what she was calling about:

> *Hopefully, whatever the string of words you say, one word will, like, resonate with it. I mean I might say, like with the problem I had recently, "It's my credit refund status," but that doesn't make sense to it, that's not something that people say commonly. They might say, "What's my checking account balance?" Or like, "I want to talk to a customer service agent." And you can say that. But sometimes you might say, "I want to talk to a customer service agent." It will say, "What can I help you with?" You say, "I want to talk to a customer service agent." It will say, "Can you tell me a little bit more about what you need so I can direct you to the right agent?" And it's just like sometimes you've just got to say something very generic so at least you end up with a person so they can transfer you to someone else who is handling your issue.* —AVA, LOS ANGELES

Ava's story is an example of the ways that interacting with bots can be like a verbal wrestling match, in which to get what you want without wasting a lot of time takes skill. Interestingly, Ava had previously tried her bank's chatbot but came to expect it to be a more cumbersome means to get satisfaction, so now she calls the automated phone assistant instead. Although hers is a story about frustration, she also expressed a degree of empathy

with the bot and with the bank itself (though she was loath to think of any corporation as a person, recoiling when asked to imagine what kind of person her bank would be). She understands why the bot would have trouble understanding what she wanted to talk about, as it was focusing on things "that people say commonly." That doesn't mean that it or her bank was working against her; instead, Ava sees it (or them) as trying to help her but nevertheless ending up excluding her from automated customer service. There isn't in this particular circumstance malice or antagonism but only what she thinks are justifiable grounds of prioritizing people with common problems. Nevertheless, the nuanced understanding evident in this quote didn't make the encounter any less frustrating. Ultimately it was mechanistic as much as it was conversational.

The Privacy Paradox

In the field of human-computer interaction, privacy researchers have long noted that what people *say* about privacy does not correlate with how they *act* regarding privacy—the so-called privacy paradox.[17] Sometimes this leads to accusations of hypocrisy, as in, "If you think Zuckerberg is listening to everything you say, why are you still on Facebook?"

This topic surfaced in many of our interviews, usually in the context of the literally always-listening virtual assistants but also regarding behavioral tracking by major internet companies.[18] Study participants often see the conflict between their beliefs and their actions. Consider this discussion with Victor (Dayton, Ohio), who does not own a smart speaker:

> *[Smart speakers] are getting to be more common. I know like a lot of old people like my mom has the Echo, and I know my girlfriend's mom she has either the Echo, I think it might be the other one. But my girlfriend doesn't want that because . . . I think it was like Amazon, like one that records you all the time. I know a lot of people are paranoid about that.*

Perceived Roles of Bots

- **Automated liar:** "Your call is important to us," followed by a long hold due to understaffing.
- **Gatekeeper, barrier:** Between consumer and a real person.
- **Off-hours or hands-free backup:** Better than nothing but not ideal.
- **Servant:** Does what it's told to do; the ideal of the virtual assistant.
- **Entertainer, time-filler, disk jockey:** What virtual assistants are most often asked to be.
- **Trusted information source:** Surprisingly so, especially as unlike screen-based web searches, audio-only responses don't make obvious that there are multiple information sources to consider.
- **Advisor:** Digital assistants are rarely thought of in this way, though Erica and presumably other financial chatbots are exceptions.
- **Companion:** Some people acknowledge it being nice just to be sharing personal space with a virtual assistant, but most echoed Mike's comment: "If I'm at the point where I need to talk to a robot, then I probably have bigger problems."—Mike, Portland, Maine
- **Influencer:** Some see bots as training them to interact in a certain way. This could be more important in the future, as suggested by Amazon's 2021 Super Bowl ad for Alexa, in which actor Michael B. Jordan becomes her "vessel."[16]

Victor personally doesn't like the idea of having an always-listening device, though he's conflicted:

> *I'm not really into [smart speakers] . . . I don't know, I kind of feel like a halfway between generations. Because I'm into technology, and I'm not into technology. Like, you know, I like Zoom, I like being able to set my appointments, I like being able to use my banking through my app. But I don't like . . . you know, what happened one day? It's done this several times and it always freaks me out, because like you know, these things [smartphones] are listening to and recording us, and then, or I was talking about a friend or something, and then I went on Facebook and then they popped up as a friend.*

Many people believe that their smartphones are surreptitiously listening, as they have trouble imagining other explanations for how they later receive certain targeted messages. Although the targeting is (with a few outliers) not being done with microphones, it is indeed happening through an array of sophisticated surveillance and inferencing technologies.[19] Victor shared another story about "stalking":

> *Amazon was stalking my Google 'cause I was looking up a game, and then in my mailbox, Amazon popped up like, "We have this game on sale." Like, I know you're stalking me at this point. Like how did you know to send this specific game at this time? Like this game's been out for months. . . . I was recently looking at it on Google, like 10 minutes ago, then all of sudden like I get this email saying, "We've got this game on sale." That's the stuff I don't like. You are invading my privacy at this moment. I'm like, I know you did this, I know you were spying on my Google, and I know that you took the information so you could advertise to me. So, those are the parts where I get a little not so adamant about [liking] technology.*

But ultimately, Victor said, even though getting an Echo gives him pause, he really doesn't care:

> *I mean maybe I'm not paranoid enough, or I just don't care. But that doesn't really bother me. I understand exactly what [my girlfriend is] saying [about not wanting an Echo] and where she's coming from with it, it's just, I hate to say it, I just don't care about it.*
>
> *It's almost a trade-off for anything. Like, [maybe there is] some weird conspiracy, but you know, people are always talking about conspiracy, and oh "They're trying to control us," but I'm like, they already control everybody. Because all you've got to do*

is say, "Hey, where is your phone?" [laughs] Nobody leaves the house without their phone. Everybody does everything on their phone. I'm like, if they really wanted to control us, they already do. But that's not the issue.

I think about five years ago, I saw like this older gentleman, he was a career professional, he was in my class, and he had one of these flip phones. I'm like, "What's that stupid little thing?" And he was just like, "I got tired of having to upgrade, and get the newer phones, and all of this stuff." He was like, "I just keep it simple." And I was like, "Man, that's a really good idea." I was like, "Man, I'm going to go to a flip phone," but then my life became controlled by my phone because I started Grubhubbing, and Grubhub is an app that works directly through your phone. You've got to have a smartphone to do this. So, I'm in a sense now locked into this thing because this is how I do my work, you know.

Victor was particularly articulate about how the privacy paradox plays out in his life, but this sense of being trapped into an ambiguous but worrisome online lifestyle is representative of many of our participants' attitudes. This mindset carries over into their attitudes toward conversational AI, obviously regarding always-listening virtual assistants but with talking with digital assistants over the phone or texting with online chatbots as well.

Overlaying this general learned helplessness about privacy invasions regarding unseen and inevitable data collection are specific worries about certain types of data and surveillance involving personally identifiable information, credit scores, fraudulent purchases, and identity theft.[20] People are well aware of data breaches and hackers and possible risks to themselves and the profiles financial institutions are keeping about them. They worry about these, and in varying degrees behave to minimize them, because they have been told to worry and told what they should do. In the domain of financial services the relationship between privacy attitudes and behaviors may not be so paradoxical, though these may not be driven by accurate perceptions of personal risk nor of effectiveness. Rather, attitudes and behaviors may result from messaging they hear from financial institutions and mass media, reflecting the interests and obligations of these external agents.

The privacy paradox is sometimes unfortunately interpreted by technologists as a green light to proceed with deploying problematic systems, assuming that users' misgivings can be disregarded without much affecting actual use. But this approach risks relating to one's customers or members as hypocrites or as uninformed people needing paternalistic care. It is true that lack of knowledge and the belief that there is nothing one can do but live with one's concerns underlies privacy paradoxes. This "don't know and why care?"

attitude is how many people come to resolve the paradox in their own lives, as seen when Victor ended with, "I just don't care" after sharing thoughts that demonstrate that he actually does. To reduce cognitive dissonance, people may avoid thinking or learning about the privacy implications of the technologies they use, falling into a complacent state of "ignorance is bliss," especially when most of their online experiences or robot-use experiences raise no issues.

However, especially for institutions such as credit unions, based on foundations of trust, it is dangerous to assume that people don't care about privacy, or don't care and won't ever learn about privacy-sensitive processes taking place without their knowledge. It will not lead to relations of mutual respect between credit unions and members.

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CHAPTER 3

Relating with Credit Unions and Banks

Appreciation and Trust

All research participants like their credit unions. This may reflect selection bias in terms of who volunteered for the study and how they wanted to relate politely with the interviewer, who they may have inferred to be an advocate for the credit union system. However, this overall goodwill is consistent with conventional wisdom. Positive regard for credit unions is clearly crucial for keeping existing members and attracting new ones.

Ties with credit unions are often deep, rooted in family or friends' preferences for credit unions, or based on positive first experiences prompted by first jobs or first accounts as college students. In this way, being a credit union member can become a part of a person's

identity or sense of self. (This can also be a part of a person's overall relationship with technology, though the nature of these relationships is clearly different.)

Participants generally understand the credit union model and see credit unions as distinct from banks in putting their members before profits.[21] For example:

> *The credit union is, I feel like they're not in it for profit. They don't charge fees to have accounts or anything like that. They're there to really help you with money . . . credit unions are really more friendly towards people [treating them], you know, just [as] people.* —JAMAR, DAYTON, OHIO

All participants give credit unions high marks for customer service, often seeing this as related to their small scale on a community level, as Jamar pointed out:

> *I think flexibility in customer service is a must. I do expect more flexibility from a credit union since credit unions are mainly local; they don't really stretch across the nation.*

Multiple participants have had bad experiences with banks, both with predatory policies and frustrating customer service. Both are illustrated in this story, again from Jamar:

> *That's how I got started with [my credit union]. And since I've been with [my credit union], I've never had a situation like that. And that's made me feel more comfortable.*
>
> *I was probably on the phone with [my bank] for like an hour just trying to figure out why would they allow . . . like why would they pay the money? If I don't have the money, then I don't have the money. . . . It was stressful. I don't feel like she was quite understanding that . . .* ***it's not her account, it was not necessarily her money that's being taken away, it's not her that's getting hit with the fee,*** *like that's all me. And* ***I feel like she didn't get it****. . . . It's like I worked for that and I don't think that the bank should* ***have the final say on what happens with my last little bit of dollars*** *that's in my account. And she didn't get that. And I really got off the phone still mad, still upset, and still frustrated. And I don't ever feel like that issue ever got resolved. And, ultimately, that's why I ended up leaving.* (Emphasis added.)

In the previous chapter we discussed the multiple conflicting loyalties of agents, robotic or human. Jamar clearly sees the bank agent as both representing her employer, and so indicating what the bank was like as a corporation, and relating to Jamar only from her own personal perspective. After all, he points out, it wasn't *her* own account, or money

loss, or being hit with a fee. By implication, Jamar sees his credit union agents (and the credit union as a corporation) as more empathetic and not as mired in their own situations. The story also conveys the powerful relationship between a financial institution and its member or customer: account holders can feel powerless after having turned over their hard-earned money to the bank or credit union, who now has "the final say" over what happens to it. Trust is required to feel that such a relationship is worthwhile.

Remote Access

Participants use ATMs, mobile banking, or online banking for most of their interactions with their credit unions, and even more so due to COVID-19. For many, smartphones are the access device of choice, by using apps and, if necessary, by placing calls to customer service. Jamar's experience is representative:

> *I really like to use the app. I feel like . . . the app is quick, almost instant. I can use the app while on the go, especially since I feel like I move around a lot.*
>
> *If I had a question I will call, 'cause even then still calling is something that I can do on the go. The only thing that would make me choose going into like their branch over calling, is the wait time in the branch is a lot shorter than the wait time for the calls. But the calls, like I said, I can do calls on the move, so that just kind of helps.*
>
> *I just think I could be calling and moving at the same time. I feel like if I go to the branch, I'm just stationary and I'm stuck, and I have to wait until I'm done there to move on to the next activity. And, I don't know, I think I'm more of a multitasker, and I think that's why I would prefer to call.* —JAMAR, DAYTON, OHIO

For some members, the need to deal with checks in particular presents complications. One higher-income participant (apologetically) is not comfortable using her smartphone camera for mobile check deposit, and another is frustrated that it is apparently impossible to find a mobile deposit–enabled account for his son who often received sporadic income in personal checks. Some lower-income members frequently have to deal with cashier's checks or money orders to pay bills, requiring trips to branches. Cash, too, can lead to difficulties: some participants said they dislike making cash deposits at ATMs or have friends who think they are strange to do so. There is something disconcerting about watching paper currency disappear into a machine, even though during the COVID-19 pandemic this is seen as safer than depositing in person.

The Value of In-Person Connection

Some participants value in-person interactions with credit union agents for providing a sense of reassurance and personal contact, particularly if there are multiple or less familiar transactions to be conducted. For example, Liam—a recent high school graduate who prides himself on his financial literacy, having taken a discrete mathematics class that touched on the topic—appreciates having a teller able to provide assistance if necessary:

> *A lot of the times I have, you know, like minor questions about [a transaction], or like sometimes I forgot to do something on the check, so as I'm depositing it, I can be like, "I'd like to deposit this check, by the way did I sign the back?" or like, "Is there anything that I needed to do on the back I can't exactly remember?" And they're . . . they've always been super-helpful, they're like, "Yep, no, you've got everything done," or just like, "Yeah, could you just sign the back for me," or whatever.* —LIAM, BOULDER, COLORADO

This behavior can be attributed to Liam's inexperience with checking, but it raises an interesting point about agents (and possibly future bots) assisting members simply by providing a second pair of eyes.

Some members feel strongly about the personal connection and sense of advocacy they find at their credit union, but none more so than Emma. Emma is a small-scale entrepreneur in Dayton, Ohio, who owns a hair salon and a day care and so relates to her credit union both as a business owner and as the head of her family.

> *There's a lot of people that knows* [sic] *me [at Wright-Patt, her credit union], especially the managers because a lot of them I have done personal banking with. So umm, yeah, they usually call me by name. . . . I've been to other banking facilities . . . and no one has made me feel more family-oriented as Wright-Patt has.*
>
> *[On the other hand, my bank] was very judgmental. They never gave hope to the ones that they may feel lesser than others. At the end I was with [my bank] for probably about 10 years. I think at the beginning I was working on my credit. So, when I did finally get my credit together and I reached out to a bank that I thought would be for me because I had been there so long, it was when I first applied for my very first piece of credit they denied me even when I felt it was no reason for them to deny me. It was kind of a hit in the face. And when I went over to Wright-Patt within that same week, they gave me the chance where [my bank] didn't. So, at that point I closed everything down with [my bank] and went back to Wright-Patt.*

Emma, who is African American, was reminded of another story of personal disrespect for which she turned to Wright-Patt. The story is worth relating in full:

> *I walked into a car lot and . . . I speak about this a lot because it was such a hit in the face to me because I do hear what everybody say* [sic] *around the world today about the racism and the lack of equality around. And, to me, I was like, well, I've never seen that, so I can't understand where you guys may feel that way.*
>
> *But when I walked into [a car dealership] . . . to purchase my first car and, upon arriving, I pulled up first, and I was sitting outside. Then another lady who was, of course, the opposite color of me, had pulled up and she went inside. But as I stood outside before she pulled up, no one came to help me, no one came to say do I need help, no one asked me what was I even doing; I would've preferred them to say, "And why are you here?" No one did that. I seen the two people, you know, watching me from the window, but never came out to greet me or anything.*
>
> *So, finally I said, well, maybe I should walk in, maybe they just don't want to come outside because it is a little cold outside. So, about after five or ten minutes looking at the car that I thought I would want, I walked inside. The two that were looking out the window never addressed me. I walked straight past them. They never addressed me and never asked me could they help me or anything.*
>
> *When I walked towards the guy that was helping the other lady, he still . . . no one ever said, "Hello, how are you? I will be with you in a minute," even when they noticed me walking in the building. Then when he finally was not being a salesman to the person, because what he was showing her apparently didn't look like something she was interested in, he finally came and acknowledged me and asked me how could he help me. But it was not in a very generous way as he was with the other woman.*
>
> *I said, "Yes, I came to look for a car."*
>
> *He said, "Well, how much do you have down?"*
>
> *I said, "OK. Don't you want to pull my credit first before you even ask?"*
>
> *"Well, I ask everybody that."*
>
> *And I'm thinking I don't think you asked her that, but OK. So . . . we ended up, he pulled my credit, he went to the back, he didn't do it in front of me, he pulled my credit, he walked to the back wherever he was going to pull it. And he comes back and he says,*

"Oh," a whole attitude change, "Oh, well, what car was [sic] *you looking at," and dah, dah, dah, dah, dah.*

And I'm like, I don't know if I want you to help me now. And so, you know, I went on, in my mind thinking I just want this car. It's not really about him, which it was 'cause I'm very huge on customer service, but I'm like I came for a car, I want a nice car. So, I told him, I said, "Yeah, I want this car." I told him I said, "I have a banker," 'cause I was already with Wright-Patt at this point, so I have a banker, he's already did [sic] *the credit, he just needs me to find the vehicle that I need.*

And he said, "OK, well, we have a contract with certain banks. What bank do you have?"

I said, "Wright-Patt."

He said, "OK, well, who are you working with?" And I told him the name. He said, "OK."

I said, "So I don't need you to pull my credit as far as to go to your bank, you can just tell me how much the car is and I'll give all that information to my banker." He said, "OK, that's fine."

And when I left . . . and I said that Monday [the next day] I will go back, and I will see how everything is going. Well, he had run my credit three times with different banks! And I was like, "Stop. Stop running my credit. Stop." I said, "I'm going somewhere else." And it was just . . . my credit was completely clean, and now I had all these different hits on my credit.

So, at that point, I no longer wanted to mess with anyone else and just mess with my credit union. They were the only ones who, to me, ever listened to me.

Emma concluded the interview by saying that, issues of respect aside, she feels an almost spiritual value to real personal connection, a connection possible only in face-to-face encounters. She told a story of once going into a local bakery with her children and getting great service from one of the workers who "left a vibe on us." Later that week, "we were sitting at home and her face popped up on the screen as a missing person" and eventually she realized this was the same woman who had been so nice to her and her children at the bakery. She continued:

You know, it's those type of moments that [make you ask] what is your legacy, what are your stories that people could say about you? Because, no, she did not make it, she did pass away.

But I was able to go into that store and say, "That employee was awesome to us. It's six of us, we came in here, we had different things that we wanted, and she never hesitated. She never not wanted to serve us; she always kept a beautiful smile." And that was her legacy is to make her customers happy. You know. And that's why I like the . . . I like to see people, I like to be knowing who I'm giving my money to, 'cause every dollar of mine counts. So that was big to me.

Emma's stories highlight the importance that real human connection can have, not just in personal life but in a range of consumer contexts. Someone performing a job in a routine or even robotic manner prevents this kind of human connection. Emma's car-financing story demonstrates how underlying disrespect, condescension, or duplicity can become evident. But the ideal of genuine human connection can create a sense of even spiritual meaning, even in brief encounters, as in Emma's story of the bakery server.

Personal Financial Support Systems

Members' relations with credit unions take place within a larger, heterogeneous network of resources they have assembled and on which they rely for financial information and support, both formal and informal. Some of these resources are other financial institutions, such as other banks and credit unions and credit card and other loan providers. (The content of people's wallets or purses often index into these resources, and serve as a record of accounts that have been established over time.[22]) Many more formal resources are online, such as credit rating access sites, consumer guides such as Bankrate, financial status aggregators such as Mint, and an array of fintech smartphone apps such as Venmo.[23]

These resources often build up gradually over time or can expand suddenly in response to financial crises such as foreclosure, bankruptcy, rent assistance; or less critical disruptions such as moving to a new neighborhood, city, or state. Habits and routines play an important part in organizing and maintaining some of these resources, even in details such as learning the locations and hours of branches and ATMs and how these integrate into one's mobility patterns around a city.

These formal resources exist within a much larger informal social network of friends, coworkers or roommates, core or extended family members, and sometimes support groups as well, as Hailey (Dayton, Ohio) noted:

I'm in a credit group on Facebook. So, I've learned a lot of information from there as well, you know. And then googling, doing Google, experience. You can get emotional support there as well. You know, working on and building your credit is . . . it's not easy.

You know that. It's easy to drop your credit, but it's hard to gain points for your credit. So, you know, you have some people in the group who want to give up because they feel like no matter what they're doing, they're not seeing an improvement as fast as what they want to see. So, they may want to give up. And you have people in the group who's [sic] *cheering them on like, "No, don't give up. You're doing it. You're doing a good job, just keep up, you're going to be able to see it." So, it's emotional support and general support. . . . [These online contacts can be better than] friends and family—they judge more so than people who you don't know.*

The influence on a member's financial situation by friends, family, and other social ties is not always positive—personal financial support networks can coexist within financial misinformation or exploitation networks, and often the boundary between positive support and negative influence can be blurry. (The same is true of formal support as well, as a person's relationship with a financial services provider can be a mixture of supportive and exploitative, with different divisions of the organization having different effects on, say, encouraging savings versus encouraging credit card debt.)

The influence on a member's financial situation by friends, family, and other social ties is not always positive—personal financial support networks can coexist within financial misinformation or exploitation networks, and often the boundary between positive support and negative influence can be blurry.

Consider the case of Sandra, who immigrated to the Los Angeles area to join a number of relatives who had relocated there and had established ties with their larger immigrant community. Sandra received important support from her compatriots in establishing a new life in the United States, from recommending banks and credit unions to partnering with her to purchase property that she and her co-owners would live in. However, the same financial support network also led to an introduction to, and implicit trust of, individuals who, through misinformation and even fraud, led to a nearly ruinous financial decision. This decision was to sell a home where she and an increasing number of relatives had been living to move to her "dream home" near the beach. So, in 2007, based on recommendations from friends and friends of friends, she took a subprime mortgage and paid a contractor a significant sum for home repairs—only to end up in foreclosure and to have the contractor disappear with her money. Through a tortuous series of repetitive and often disrespectful phone calls with her mortgage bank, even after submitting the required paperwork, she was finally able to renegotiate the loan and keep out of foreclosure.[24]

Credit unions do not play a dominant role within the financial support systems of our participants, often serving primarily as checking and savings account providers with customer service available to answer questions. They are not usually thought of as sources of financial advice or of overviews on the current state of one's finances. Instead, this guidance comes from friends or online resources (mint.com is particularly valued for providing overviews).

One exception is Victor (Dayton, Ohio), who is thankful for advice he received from Wright-Patt regarding a car loan he had with a smaller credit union across town:

> *I needed a car like right now, and I just went out there. And the people, when they did my processing and my credit and stuff, used [my former] credit union. It's actually a funny story. [My former] credit union was the only people that were going to sponsor me, or give me a loan, but they didn't realize . . . it was something, because on the day of the signing, and this is really why I liked [my former] credit union, because there was some information that came up, I forgot what it was* [he remembered later that he was supposed to have a co-signer for the $4,000 loan], *but . . . it was supposed to be like a deal killer, like they weren't like supposed to sign, I mean they were like, "Oh, we're not supposed to give it to you," but since they had went* [sic] *that far, they were like, "All right, we'll take a chance," and they gave me the loan. Luckily, you know, it worked out for everybody 'cause I didn't default on the loan.*
>
> *I wound up going back to Wright-Patt, and they was* [sic] *like, "Well, we can give you a cheaper deal," so . . . they paid [my former] credit union . . . and that's how it actually wound up with Wright-Patt.* [He was planning to close his account with the other credit union.] *But I was actually advised by one of the people at Wright-Patt that it's nice to have two . . . you know, have an extra savings account, or be affiliated with another bank because you need more loans or something. So, I just left that account open as kind of a savings account, I just kind of throw money out there. I don't even have like a credit card or an ATM to it. So, hopefully the money will stay out there. If it doesn't work out like that but, you know, it makes it harder for me to get to it, so at least it stays out there for a while.*
>
> *Wright-Patt's the only people that have ever given me any type of financial advice or any type of help.* [However, he explained previously that he was grateful to the other credit union for the help they provided in being willing to bend the rules on the day of signing his auto loan.]

Victor's story is unusual (especially as it apparently involves a credit union agent deciding to depart from required procedures), but it illustrates what seem to be some valid general points:

- Valuable financial advice from credit unions can arise opportunistically, as when Victor's conversation about car-loan rates leads to advice about keeping accounts at other banks or credit unions open.
- Advice from credit unions can be a mix of self-serving (Wright-Patt wanted his car loan), member-serving but also self-serving (they explained they had a better rate than the competitor), and member-serving at possibly their expense (they advised him to keep open his relationship with a competitor). Credit unions offer valuable products and advice, but they are not neutral third parties (as likely is true of many of the other resources in a member's support network).
- Advice can take the form of suggesting keeping or changing elements of the member's personal financial support system and so has effects that ripple through the member's network.

CHAPTER 4

Financial Digital Assistants?

Unfamiliar Terrain

Apart from the two participants who have used Erica, our research participants first encountered the idea of applying digital assistant technology to the domain of personal finance in the study's recruitment flyer. Given the novelty, they do not find this idea immediately compelling. The ways they interact with financial institutions do not involve conversational AI to any obvious degree, nor do the ways they use virtual assistants have much to do with their finances. The idea of speaking to a mobile device or smart speaker often raised questions about privacy from overhearers.

This is likely more of an issue for an exploratory study like ours in the early days of the technology than in the future, as participants were able to engage with the idea of a financial digital assistant (FDA) without too much trouble as our conversations progressed. As Erica and her kind become better known, the idea of the FDA will become less strange. Concerns

regarding overhearing may be minimized if these systems are marketed for use without audio (using keyboards and screens), for use with hands-free systems when alone in cars, or for use in home offices or other private areas of homes (multiple smart speakers in homes will become more common).

However, the idea of getting advice or assistance from conversational technology, rather than just treating it transactionally as a servant waiting to be told what to do or a chatbot with limited context or functionality, is likely to require inventive thinking for some time to come. This is especially true of the potential marriage of FDAs with paradigms of supporting "financial wellness" through more ongoing, intimate relationships between members and credit unions.

Financial Wellness

With our study participants, we briefly introduced financial wellness as a potential new paradigm for customer service that banks and credit unions were considering. This would involve banks and credit unions understanding the ongoing financial lives of their customers and members in order to serve them in a more holistic, comprehensive manner. Our goal was to use this rather nonspecific, open-ended probe to see what would come to mind and gauge the overall attractiveness of the general idea.

Terms such as "financial wellness" and "financial health" can create anxiety, as Mike (Portland, Maine) pointed out:

> *I think I, and many of us probably, when we hear "financial well-being," you have this moment of like a little bit of guilt, and a little bit of not real eye contact, right? Because that brings up for a lot of people like, "Oh, I should have been doing this. And I should have been planning this better. And I should have been putting myself on a financial better footing than I am."*

This is consistent with what Wells Fargo anthropologists Robin Beers and Pamela Whitney found in their ethnographic study of consumer attitudes toward budgeting.[25] They noted, "For most, the term 'budget' carried a negative connotation mixed with guilt, like the feelings associated with needing, but not wanting, to go on a diet" (146).[25] This comparison of budgeting to dieting is apt: both are multibillion-dollar industries based, in part, on playing upon consumers' guilt and negative self-image, as well as an important research topic in public health. Questions of how to promote financial wellness are similarly thorny but important, raising numerous practical and ethical issues, even ignoring the significant

individual and cultural differences in how people relate to their money. Even in our small sample, for example, some participants report being devoted users of Mint to track their finances. Some participants are proud of their financial literacy skills, particularly if they have emerged from crises regarding foreclosure or bankruptcy.

Future research that systematically engages these individual and cultural differences and generates more grounded discussions of particular system proposals could prove valuable in developing and marketing financial wellness products. As an exploratory study, our findings on the notion of digital assistants providing support for financial wellness suggest caution—simple exposure to the general idea does not immediately generate enthusiasm.

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One particular system proposal was developed, ad hoc, in conversation with one participant, and it generated enthusiasm. Jamar (Dayton, Ohio) shifted the conversation from "financial wellness" to "personal banking" and imagined a potential partnership between his credit union (Wright-Patt) and Apple such that Siri would answer the phone when calling for customer service. (Jamar is an Apple devotee, having an iPhone with Apple Pay and an Apple Watch on which he checks his balances.)

> *I could see that actually working. And I could see them being able to take more calls at a higher volume because Siri would be able to, like I said, you have those conversations, so you could kind of talk back and forth with her, kind of explain to her what's going on. And as long as she had like tons of different responses to each and every question, I'm sure by now they have probably have . . . Wright-Patt's probably taken well over a million phone calls, and all the calls get recorded.*
>
> *So, if you take all of those scenarios and just plug them into Siri, I'm sure they would be able to solve a lot of problems really quick. I bet you it would be quicker than actually waiting for an agent to get on the phone. I don't think that would be a bad idea at all if they actually got it to work, if they could really get the interface down. . . . It would almost feel like a personal banker. You would just call up your bank, you'd talk to them. . . . I feel like, again, it would move smoothly. I feel like that would be great for . . . I think I would like it; I think I would use that. I would just call, ask questions, see what*

they could help me with, especially if I could do like, "Hey, Siri, can we do multiple things at once?" So, it's like can you move the money over here, and then can we pay this bill, and then can we do like X-amount or whatever else I have to do.

When asked what he thought about tech companies wanting to move into providing banking services, Jamar remained enthusiastic about Apple:

Apple is real big on privacy right now since that FaceTime incident happened last year. I feel like I'd probably be more trusting with Apple just because I know like they're going the extra steps to be more [cautious] and actually protect your information. And just thinking about it right now, I know like, for example, like your messages on your phone, they stay on your phone; they're all encrypted so nobody can get to them. So, if they had a Siri banker that was the same way, so all of your conversations with Siri was [sic] *encrypted, and she remembers them and she talks to you, but like it's not stored on no* [sic] *cloud server or anything like that where everybody has access to it, or where it's easily hackable, I feel like, yeah, I would definitely probably bank with Apple.*

You Are Better Off Talking to a Person

Along with financial wellness, we asked participants more specifically about the idea of calling their credit unions and having a digital assistant answer the phone to work with them on the problem they were calling about. We asked, "Would you rather talk to a person or a bot—when and why?"

Our participants have no problem thinking about the pros and cons of talking with a bot compared to talking to a person and find it hard to imagine that AI technology could ever close this gap. There is broad consensus that, all things considered, it is better to talk to a person—if the person is not acting as a bot (see "The Value of In-Person Connection" in the previous chapter).

In consideration of the person-versus-bot comparison, key advantages of people include:

- Empathy, and a general sense of being heard and supported.
- Flexibility and persuadability, whereas bots without discretion follow a script.
- General intelligence, in being able to handle complex, multifaceted transactions or problems.

The following quotations give some examples of how these themes arose in our interviews:

> *When you're chatting with a robot, honestly, I feel like they're giving you just basic information. They can't . . . and you may have a specific question that's not just like a normal, general question. Versus, chatting with a person, you can ask them anything and they can go look up this information or they can try to find this information. Now chatting with a robot, it's like the robot telling you, like I say, giving you general information in regard to what they're programmed to know or say. So, that's why I would rather prefer a person over a robot, because you get more specific details.* —HAILEY, DAYTON, OHIO

> *The computer doesn't have emotions, so it puts everybody on the same playing field. It kind of takes that case-by-case, scenario-by-scenario type out of there because those would be the rules. [...]*
>
> *I think you're better off with a person. Don't get me wrong, Siri and Alexa are both great, but they're computers, and I don't know, they just don't have the understanding. So, they know what you're saying, but I guess they wouldn't understand. Like for them it would be embedded into their code that this is policy and it'd probably be set up to a point where those computers they wouldn't be able to change; like they wouldn't be able to bend one way or another, they wouldn't be able to do this or do that because their code is strict. Like this is what it is, and like it wouldn't be able to deal with it. Whereas if you're talking to a person, they can hear it in your voice, and they can kind of understand, and their feelings kind of get involved in a way to [the point where] they might be able to help you if they can.* —JAMAR, DAYTON, OHIO

> *I know that if I get someone on the phone, I can generally talk my way out of most things. So, and I'm not saying that like hundreds of dollars, but I had an overdraft on my account, and I probably had maybe five overdrafts in my adult life, maybe. And it was totally kind of innocent in that the deposit that was supposed to be made, you know, the credit union that I have, it drives me crazy because . . . and this is their practice, they say this, they take the withdrawals out at midnight, but deposits don't get deposited until later in the day. So . . . even if the deposit came in at say midnight,*

even if it's a direct deposit, deposits don't get credited till later in the day. . . . So, even if it was a withdrawal of $25, say, it didn't matter; that withdrawal came out first and so they said I had an overdraft. And . . . I have overdraft protection . . . so they paid the bill, but they were still going to charge me $32.50. So, I knew I had to call and say, "Listen, this is what happened." And so, they go through the whole rigamarole of "this is our practice and our policy." And I say, "I've been a member of your bank for 6½ years, you can see by my account that this does not happen often, you can see exactly what happened, you see the deposit there, you see the withdrawal there, you know that the money was there." And so, they generally, they will credit me. Now this happened a couple of times and they have not credited me the fees, and it's been very frustrating.

But for the most part I am a well-spoken, intelligent woman, and I know that I can get things reversed. . . . But when I lived in Minnesota, my job was to advocate for the elderly and disabled, and they could not get anything like that. Like unless they had somebody like me speaking for them, nothing would work. They couldn't get anything overturned, never. They could never. And it was so wrong. It's so wrong how people get taken advantage of. —JENNIFER, BOULDER, COLORADO

Some participants have experience working in customer service and were particularly articulate about the kinds of flexibility a human agent could have.

It really all depends upon the person, I feel like. Even though they represent the company, I think it's the individual person. And I say that because I've worked in a call center [for Victoria's Secret] in the past, part time. . . . You have some people who are, you know, happy and they're willing to help the customers, and you have some people that's [sic] *just there for a check.* —HAILEY, DAYTON, OHIO

'Cause when it comes to government stuff, it's kind of cut and dry. [Victor works in taxation.] There's not really a whole lot of wiggle room. It's like a tiny little bit of wiggle room but not really and because the government's cut and dry. But you can . . . I mean, it's all about your approach. You can do the cut and dry thing, "Well this is what happened, you didn't have this, so that's it." Or, you can be like, "Well this is what happened, you didn't have this; however, if you do this and this, well, maybe if you do this, or if you go back and maybe go here." . . . You know, it's about that extra step. But the step is optional. You don't have to take it. —VICTOR, DAYTON, OHIO

However, human agents can be so frustrating, unempathetic, and rigid that one is better off interacting with a robot. Sandra (Los Angeles), who ended up urgently needing to renegotiate her subprime mortgage, related how she wishes many of her dealings with the mortgage bank could have been better handled by a computer:

> *[I felt I was being judged.] You can just hear it from the tone in how they talk to you when you're approaching it with, "I really need help. I'm . . . you can see I'm already hundreds and thousands delinquent and I just need for you to adjust my rate, or help me with some program, or reevaluate my value, my home value," and all that stuff. And they read kind of like a script, or tell you, "Ma'am, we do not have your documents." "But I already faxed it." And you explain how your calls have been dropped and now it's like two weeks later and now you're approaching another payment date and, you know, all the things. And you still get kind of like a cold, you know, "I'm just doing my job here of telling you we don't have any of your documents and you need to fax it over," or "You don't meet the requirements."*
>
> *They were still very, using, you know, words like "ma'am" and staying true to the script or using the right words. But it's very formal, not polite in a way of being genuinely polite. It's more you can see it, the manager tells you, you need to read this so that they don't have any complaints and we stay by the guidelines kind of thing. It's not personal at all . . . but it's annoying to hear someone go by a script. . . . It's like, "I'm not stupid, you know, don't talk to me like that. I'm trying to be . . . I'm trying to talk to you like human, you know, with feelings here, and you're giving me kind of like a script."*

Human agents can be so frustrating, unempathetic, and rigid that one is better off interacting with a robot.

"It's like, 'I'm not stupid, you know, don't talk to me like that. I'm trying to be . . . I'm trying to talk to you like human, you know, with feelings here and you're giving me kind of like a script.'" —SANDRA, LOS ANGELES

Sandra imagines that a chatbot would be better able than a human agent to help her step back and understand what options she had to deal with her overall situation:

> *I didn't know what other options or help were available for me. And I didn't even know who to talk to about it. Do I call them? Or do I call someone else, or a new company? I just wanted to know what my options are and what I should do, or how I should deal with this issue without having to go through all of that frustration again. 'Cause you're already cynical, you're already, you know, worried about things, and you've already lost a lot of time, and it's not easy.*

Ava (Los Angeles) also thinks there may be some advantage to talking to a bot to avoid judgment, but she is skeptical:

> *Money is such . . . everybody has like different levels of comfort with talking about money. I mean depending on what you're calling your [bank's] customer service about, sometimes it can be awkward. . . . Everything has pros and cons, but I think something that might be helpful in the sense of Erica is that it might make the ability for you to talk about your money, or ask questions that might seem stupid, or rudimentary, or basic, to be able to ask [the chatbot] and know that it's a robot and at least no one's judging you at the other end.*
>
> *It MIGHT be, but it would have to be very . . . it has to be a lot more advanced than what Siri and Alexa are now for you to have a real conversation. Like being able to get some real benefit, you know, that's not just an alternative way of doing the same thing on a visual level.*

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We thought that we might hear some preferences for bots over people out of concerns about human agents with racist or other discriminatory attitudes. However, except from Jennifer's mention about preferential treatment she received compared to the elderly and disabled people she had advocated for, these questions of human bias did not surface in our conversations. If anything, occasional concerns about "algorithmic bias" (unintended

biases encoded into computing systems) surfaced in conversations with university-affiliated participants who had heard about this topic.[26] As conversational AI systems become increasingly able to identify social characteristics in the transcripts they record, these issues will require careful attention.

What Does My Credit Union Know About Me?

Conversational AI system abilities are constrained by the amount and quality of data they have available to them. Credit unions have a wealth of data about their members that could potentially power a financial digital assistant, but only if members understand and accept the use of these invisible resources.[27]

To start to address this topic, we asked participants what they think their credit union or bank knows about them, how this differs from the data possessed by other companies, and related perceived benefits or concerns. As discussed in "The Privacy Paradox" section above, there is a general background sense of resignation regarding the inevitability of companies using more and more powerful technologies to collect ever more detailed information about all aspects of their lives. However, how participants think about financial institutions is very different from how they think about technology companies.

Participants have not thought much about what banks, credit unions, and other financial services know about them. When asked, their inferences are grounded, unsurprisingly, in what they see (accounts and their balances, transaction histories, credit limits, automated warnings about suspicious credit card activity, credit scores, etc.) and what they have been told (to worry about fraudulent transactions, identity theft, incorrect information in their credit records, etc.). Though this covers only a small part of the actual data ecology in which they are embedded, this limited view makes sense. Certain information that financial and payment services have about them is particularly private and sensitive, but participants knew how they could help protect this information and so felt a sense of control over it. Data breaches are an exception; study participants feel they can do nothing about these but have to rely on the trustworthiness of the behind-the-scenes procedures that companies are taking to safeguard their data. For the most part, participants are not worried about their credit unions or banks being at risk from hackers.

Compared to big technology companies like Facebook, Google, or Amazon, participants generally think banks and credit unions know little about them. Mike (Portland, Maine) was blunt:

> *The amount that my bank knows about me is one one-hundredth of what Facebook knows about me. Right?*

There are exceptions, though. Jennifer (Boulder, Colorado) thinks credit unions and banks know a great deal about her, but she trusts credit unions much more than banks to have this data:

> *When I think about like the banks and house loans, I mean they've literally got everything. They have got everything. They've got your tax returns, they have your pay stub. They have everything. So, I don't know how much more there is. . . . Would I trust the credit union with it more than I would trust a bank? Well, yeah, I would. But I don't have any basis for that other than my own gut, honestly.*

Jennifer sees this in the larger context of growing personal data collection by many companies, over which she has little control:

> *I feel like all of this is inevitable, I really do. I just feel like technology and the capability of . . . I don't necessarily [think it is] an invasion of privacy. I just feel like all our data is out there. It just is. Everything about us is out there already, and it's just going to get easier to access. And I'm not talking like conspiracy theories, nothing like that, it's not that. I'm just . . . a realist and I'm not overly concerned about it because it just feels like I'm going to live my life, I'm not going to worry about all of that stuff. And so, you know, it just isn't that big of a deal to me, it really isn't.*
>
> *[If] someone's going to . . . have access to all my data, I would rather it be the credit union where I have my money and where I have my . . . where I have, you know, been storing my money for the majority of time rather than some national chain of banks that doesn't care about me or know me from, you know, the next person. Now that is naive, I get that. But that's how I feel. That's literally kind of how I feel. And I get that it doesn't make a lot of sense. But I'm not . . . Like, I'm all for cybersecurity and taking whatever precautions you can, but I have to put some trust somewhere. And if I'm going to put some trust somewhere, I'm going to put it with the credit unions. That's what I'm going to do.*

Her former colleague, Mia (Boulder, Colorado), doesn't know what her credit union knows but imagines it is quite a lot:

> *Well, I mean, other than the obvious basic things that they have on our account, what I don't know is do they record, or pull out information that is more of like a profile? So, would they have on there that I'm married, and have a son and a daughter? 'Cause*

we all have accounts there and they've all been connected at some point. Would they have the information? I don't know. Would they have, I would think they would have kind of habits, spending habits, but again I don't know. Umm . . . probably, you know, how much we frequent ATMs, or the app, or the computer, how we access them, or in-person, I don't know. Those transactions are recorded somehow, so do they track all of that? I would think, but I don't know.

She compared these possibilities to the probabilities of what big tech companies know:

I would think that the online companies know way more because . . . or Google Assistant, or anything 'cause we're asking them all sorts of questions. Some are organizational things in life, and then others are things about songs, or your interests, or curiosities, and all sorts of things that you're asking it that . . . I mean, I do often pause like if I'm asking something that could be interpreted in a weird way. I'm like, "Hmm, should I do that? Is that going to be on there somehow?" but meh, whatever. So, I think just because of the way . . . you know, the banks, I don't know, I would think they would know a lot about us because money is a big deal. But it doesn't seem like they know . . . it doesn't seem like they're tracking as much personal information, but I imagine they really are. But it just doesn't seem like they are.

The Way Forward

Taken together, these study results support some cautious optimism for the prospect of more capable financial digital assistants than today's Erica, Eno, and others. In general, these will require the merging of two unfamiliar ideas:

- Credit unions know a great deal about one's financial situation, the ways in which it is changing and to what kinds of help one may be receptive.
- These data can be used effectively to create sophisticated chatbots and virtual assistants who are not merely servants to be commanded but advisors to be consulted.

Credit unions do have the necessary trust, more so than banks, to move in this direction. Providing new forms of financial advice through digital assistants is consistent with members' appreciation for the nonprofit, members-first mission of credit unions.

However, credit unions would need to reveal the depth of information they can infer about each member and the value this can provide to members in a way that steers clear of

the discomfort and distrust that the ubiquitous, online targeted advertising economy has created. As a targeted ad can be seen as a personalized bit of unsolicited advice, the idea of a digital assistant delivering the right bit of advice, to the right member, at the right time is not dissimilar from the goals and methods Facebook, Google, Amazon, Netflix, and others have for shaping behavior in their intended direction.

The way forward is to develop particular product proposals and data transparency policies (beyond terms of service or security and privacy commitments) that can provide members clear benefits and data collection and use justifications. In this way, members can broaden their imagination of what they could achieve by relating with their credit unions through talking computers.

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CHAPTER 5

Design Implications

Summary of Findings

Credit unions have an opportunity to deploy digital assistants in ways that improve service delivery, member experience, and provide new types of service offerings. In thinking about which types of digital assistants would provide the best fit for your credit union and member needs, keep the following research findings in mind:

- People like the promise of bots as part of a modern, organized, and simplified life.
- The realities of bots fall short of expectations and limit imagination.
- People are resigned to the constant advance of technology without transparency or the ability to meaningfully opt out.

- Relations with credit unions are valued for the human element and trustworthiness, even if this means older, clunkier tech.
- The design space is complex, and more tech is not obviously the answer.
- The idea of talking with/through bots is becoming mundane, and credit unions could pleasantly surprise members.
- Credit unions could tailor these technologies to show their strengths and to educate members not just about finances but also about data.

Design Principles

- **Carefully balance investments in human agents and in automation**, erring on the side of human agents, whom members will prefer to talk with for the foreseeable future, especially when flexibility and understanding are paramount. (This study has not considered using digital assistants to aid human agents, but that could be an important way of synergizing both kinds of investment.)
- **Augment, rather than supersede or presume to replace, personal financial support networks.** The value of credit unions is realized within the context of these member-created resource aggregates.
- **Assume people *do* care about what data/knowledge you have** about them, and how you are using it. Otherwise, instead of feeling empowered and respected, members will feel resigned and objectified. A corollary: **consider ways to make visible and useful community-level data**, as the sensitivity of aggregated or anonymized data is less than for individualized personal data.
- Approach digital assistants as **an opportunity to strengthen appreciation for the credit union ethos**. They could take on the roles of servant, advisor, and educator.
- **Exceed low expectations** for financial service chatbots; learn from Erica's successes and failures. Make members *want* to use them, not just *have* to use them.
- **Underpromise and overdeliver.** Though this is a complex and challenging design domain, it is also one in which credit unions could demonstrate generally unexpected tech leadership and innovation.

Possible Design Directions

To create a competitive advantage, credit union digital assistants would have to not only be useful and usable but also embody and express the core values of the credit union system. By building upon the core values of empathy and respect that are central to the credit union system, credit unions could focus their development of digital assistant technologies in a way that creates differentiation, even in the face of greater resources available to larger

financial services providers. We used findings from our research to generate design ideas that are meant to illustrate pathways worth exploring, developing, and evaluating. There is likely no single obvious "killer" financial digital assistant, but if there is one, considering in parallel a range of possibilities would be a justifiable approach.

Build a helpful, always-accessible agent. Perhaps the most obvious direction is to follow in the footsteps of Erica and her counterparts by creating a helpful robot agent. As members will expect, this bot will stand between them and the human agent they often will prefer, but in as helpful and invisible a way as possible. In addition, it will offer simple financial assistance, advice, and education to members who do not want to bother or deal with a human agent unless the situation warrants. Just as, for example, Erica serves as a voice of Bank of America, this kind of agent-bot could serve as the voice of the specific credit union—but also demonstrate the "members not customers" ethos of the credit union value proposition.

Provide an assistant to help members maintain, augment, and monitor their personal financial support system. This conversational AI would be a long-term companion as members move through their lives (different life stages, different jobs, different homes or cities), unobtrusively monitoring all of the different resources, business, technological, social, and personal elements members have assembled to support their personal finances and decisions. As a kind of embodiment of their personal support system, this assistant would suggest and anticipate changes members might want to consider—while keeping them in control. It might be implemented in a manner similar to Alexa: having a single trusted core to which members can add (or remove) "skills," through which they could flexibly interact with selected peer and institutional partners.

Provide robot counsel. Somewhat like an attorney (but without all the drawbacks and overhead), this financial digital assistant would act in limited ways on members' behalf and help mediate their relationships with participating credit unions, banks, and other financial services. At a basic level, it could serve as a "second pair of eyes" as members conduct transactions, intervening if necessary but always being available for reassurance or advice. It might serve as an intermediary that would collect, aggregate, and filter questions and offers coming from current and potential service providers, and in turn allow members to provide answers and make inquiries to this single AI. More advanced versions might actually bargain on members' behalfs in some circumstances, such as requesting fee waivers.

Connect members to each other. Using aggregate data that credit unions have regarding members, this assistant would embody the credit union not just as a service provider but also as a member cooperative, helping connect members to each other. It would focus as much on how individual members may help each other as it would on providing insight

into their own personal finances and accounts. This assistant could reveal different ways the collective data divide the membership into segments and show individual members the degree to which they resemble each persona/category. And it would be a natural channel through which credit unions could communicate and demonstrate their commitment to service and benefit at the community level, not just the individual one. What if this assistant created and facilitated virtual community spaces where members could interact and consult with each other on financial decisions with mediated guidance from the assistant?

These brief design ideas are by no means exhaustive of what our findings could be used to spark, but they hopefully provide a sense of the range of ways in which financial digital assistants could be imagined.

Endnotes

1 A design space is a way of conceptualizing a set of related design possibilities as being located with respect to one another within a multidimensional space. As the design process focuses in on a particular opportunity or set of issues, these spaces may even be quantified and mathematically modeled to explore specific design requirements; in this paper, we use the term more broadly and qualitatively.

2 We use pseudonyms to protect the privacy of our research participants.

3 The term "artificial intelligence" or "AI" was often met with skepticism, as existing systems were not seen as sufficiently intelligent to warrant that designation.

4 Robert B. Settle, Thomas W. Dillon, and Pamela L. Alreck, "Acceptance of the Phone-Based Interface for Automated Call Direction," *Behaviour & Information Technology* 18 (1999): 97–107. doi.org/10.1080/014492999119147.
Louise Dulude, "Automated Telephone Answering Systems and Aging," *Behaviour & Information Technology* 21 (2002): 171–84. doi.org/10.1080/01449290210000013482.

5 Caroline Bassett, "The Computational Therapeutic: Exploring Weizenbaum's ELIZA as a History of the Present," *AI & Society* 34 (2019): 803–12. doi.org/10.1007/s00146-018-0825-9.

6 Bianca Chan, "Bank of America Builds Out ERICA to Support Live Chat," *Bank Automation News*, bankinnovation.net/allposts/focus/cust-xper/bank-of-america-builds-out-erica-to-support-live-chat/.

7 How technologies are designed and deployed have consequences that reveal the values of their builders. A foundational work in the "Values in Design" literature is Winner's analysis of "politics" (consequential values) and "artifacts" (technologies): Langdon Winner, "Do Artifacts Have Politics?," *Daedalus*, 109 (1980): 121-136.

8 Taylor C. Nelms and Stephen C. Rea, "The Credit Union of the Twenty-First Century," filene.org/learn-something/reports/the-credit-union-of-the-twenty-first-century.

[9] DXC Technology, "Using AI to Personalize Customer Engagement," www.dxc.technology/enterprise_and_cloud_apps/events/148193-using_ai_to_personalize_customer_engagement.

[10] "AI and Beyond: What Banks Can Learn From Retailers to Boost Customer Acquisition," integrate.ai/resources/ai-and-beyond/.

[11] Often the data subject may have, through recall of privacy policies they had agreed to, some general level of knowledge that data were being collected about them. However, they would not have detailed knowledge of what was happening behind the scenes.

[12] Richard H. Thaler and Cass R. Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness* (New York: Penguin Books, 2009).

[13] In thinking about these relationships, we took the point of view of members, but these technologies also could have implications for how credit unions think about and interact with their members.

[14] Zoom proved to have a number of advantages, despite providing much less opportunity to observe the larger context of participants' lives. Participants were comfortable conversing over Zoom, audio and video recordings were unobtrusive, and the geographical coverage of the study was inexpensively broadened.

[15] For example, Google's Duplex system. Brian X. Chen and Cade Metz, "Google's Duplex Uses A.I. to Mimic Humans (Sometimes)," the *New York Times,* May 22, 2019. www.nytimes.com/2019/05/22/technology/personaltech/ai-google-duplex.html.

[16] Igor Bonifacic, "Michael B. Jordan Is Alexa's Voice (and Body) in Amazon's Super Bowl ad" (February 2, 2021), www.engadget.com/amazon-alexas-body-ad-super-bowl-195534864.html.

[17] Since the term was first coined in 2001, the "privacy paradox" has been the subject of many different investigations, without consensus regarding effect size, contextual conditions, and underlying cause. For a recent survey, see Spyros Kokolakis, "Privacy Attitudes and Privacy Behaviour: A Review of Current Research on the Privacy Paradox Phenomenon," *Computers & Security,* 64 (2017): 122–34. doi.org/10.1016/j.cose.2015.07.002.

[18] Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (New York: PublicAffairs, 2019).

[19] Kaitlyn Tiffany, "The Perennial Debate about Whether Your Phone Is Secretly Listening to You, Explained: 21. It's True and It's Not True, and It Also Doesn't Even Matter," *Vox* (December 28, 2018), www.vox.com/the-goods/2018/12/28/18158968/facebook-microphone-tapping-recording-instagram-ads.

[20] Irina Shklovski, Scott D. Mainwaring, Halla Hrund Skúladóttir, and Höskuldur Borgthorsson, "Leakiness and Creepiness in App Space: Perceptions of Privacy and Mobile App Use." In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14)*. ACM (2014). doi.org/10.1145/2556288.2557421.

[21] However, not all aspects of the credit union model were top-of-mind for participants; for example, no one brought up the cooperative governance of credit unions.

[22] See: Scott D. Mainwaring, Ken Anderson, and Michele F. Chang, "What's in Your Wallet? Implications for Global E-Wallet Design." In *CHI EA '05: CHI '05 Extended Abstracts on Human Factors in Computing Systems*. ACM (2005), pp. 1613–1616. doi.org/10.1145/1056808.1056979. And also: Scott D. Mainwaring, Ken Anderson, and Michele F. Chang, "Living for the Global City: Mobile Kits, Urban Interfaces, and Ubicomp." In M. Beigl et al. (Eds.), *UbiComp 2005, LNCS 3660* (Berlin & Heidelberg: Springer-Verlag, 2005), 269–86.

[23] Bill Maurer, Melissa K. Wrapp, Chandra Middleton, Vivian Dzokoto, and Jenny Fan, "The Lessons of Fintech Apps: Design Matters for Personal Finance" (Filene Research Institute, November 20, 2019), filene.org/learn-something/reports/the-lessons-of-fintech-apps-design-matters-for-personal-finance.

[24] Her experience was similar to many profiled in anthropologist Noelle Stout's book *Dispossessed: How Predatory Bureaucracy Foreclosed on the American Middle Class* (Oakland: University of California Press, 2019).

[25] Robin Beers and Pamela Whitney, "From Ethnographic Insight to User-centered Design Tools," *Ethnographic Praxis in Industry Conference Proceedings* (2006): 144–54. doi.org/10.1111/j.1559-8918.2006.tb00043.x.

[26] For example, Kate Crawford, "The Hidden Biases in Big Data," *Harvard Business Review* (April 1, 2013), hbr.org/2013/04/the-hidden-biases-in-big-data; and Nick Seaver, "Knowing Algorithms," in Janet Vertesi and David Ribes (Eds.), *Digital STS: A Field Guide for Science and Technology Studies* (Princeton: Princeton University Press, 2019), 412–22, digitalsts.net/wp-content/uploads/2019/11/26_digitalSTS_Knowing-Algorithms.pdf.

[27] This is not to underestimate the difficulties for credit unions to achieve effective legal and technical access to these data, which are often out of practical reach.

List of Figures

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