Title

The Lessons of Fintech Apps: Design Matters for Personal Finance, Report #487

Authors

Maurer, Bill
Wrapp, Melissa K
Middleton, Chandra L
et al.

Publication Date

2019-11-20

Filene

REPORT

The Lessons of Fintech Apps

Design Matters for Personal Finance

Bill Maurer, PhD
Dean of the School of Social Sciences and Professor of Anthropology; Criminology, Law and Society; and Law, University of California, Irvine

Melissa K. Wrapp
PhD Candidate in Anthropology, University of California, Irvine

Chandra L. Middleton
PhD Candidate in Anthropology, University of California, Irvine

Vivian Dzokoto, PhD
Associate Professor, Virginia Commonwealth University

Jenny Fan
Institute Manager, Institute for Money, Technology and Financial Inclusion (IMTFI)

Acknowledgments

The authors are grateful to the participants of this study for their candor, their willingness to try out these apps, and their bravery in breaking one of the United States' greatest cultural taboos: talking about money! We also thank the Filene Research Institute for its support of this project.

Filene thanks the following sponsors for helping make the Center for Emerging Technology and this important research possible.

Table of Contents

Executive Summary

Overview

Personal financial management apps provide lessons to credit unions that, if put into practice, should not only help improve their public perception but also create deeper engagement with younger members. This report highlights the opportunities and risks for credit unions endeavoring to provide mobile-first apps.

Fintech-based personal financial management (PFM) apps are providing new ways for budgeting and investing. In an effort to attract or retain Gen Z and Millennial members, financial institutions have been quick to adopt products similar to Mint or Acorns. In the race to provide these services, few financial institutions have reviewed and explored the value that such products provide, and how people interact with and feel about budgeting and investing with these new apps.

What Is the Research About?

Filene piloted a study that tested three PFM apps for budgeting (Mint, Wally, and You Need A Budget) and two for investing (Stash and Acorns). Twenty-seven participants between the ages of 18 and 34 used an assigned app for one month. Each participant was interviewed before and after using the app. Focus groups were held to provide additional insights.

We set out to learn three things from this study:

- How do people use these apps? And how does the design of the apps shape the user experience?
- What are the apps really teaching users? Are there conflicting messages to “buy” in budgeting apps? And how do users’ behaviors change as a result of using the apps?
- How effective are the apps at getting people to improve their financial behaviors?

Surprisingly, we learned that traditional financial institutions are still preferred over PFM apps. Although the apps have their benefits, people still want access to actual people in their financial institutions. In terms of design shaping the user experience, good design begets credibility. Poorly functioning or shoddy-looking apps eroded trust in the financial institution.

The apps tended to *raise awareness* of participants’ budgeting or investing behaviors rather than change behaviors. For some, using the apps reinforced preexisting frustration or stress participants felt about their financial lives. With investment apps, some participants felt that the gamification of the apps promoted addictive behaviors.

MEET THE AUTHORS

Bill Maurer
Dean of the School of Social Sciences and Professor of Anthropology; Criminology, Law and Society; and Law, University of California, Irvine

Melissa K. Wrapp
PhD Candidate in Anthropology, University of California, Irvine

Chandra Middleton
PhD Candidate in Anthropology, University of California, Irvine

Vivian Dzokoto
Associate Professor, Virginia Commonwealth University

Jenny Fan
Institute Manager of the Institute for Money, Technology and Financial Inclusion (IMTFI)

What Are the Credit Union Implications?

Credit unions wanting to incorporate budgeting or investing services into their mobile offerings can benefit from knowing how participants responded in this study. To best serve members, credit unions should consider the following insights from this study:

- **Design for trust.** Apps that are difficult to navigate or lack functionality are likely to reflect poorly on your organization's trustworthiness.
- **Design for financial instability and uncertainty.** Americans do not always have reliable and steady income, and budgeting apps need to account for the growing ranks of independent workers.
- **Design tools that are adaptive, not prescriptive.** Users want the autonomy to personalize their budgeting apps to better reflect their reality.
- **Make room for people's existing financial practices.** Allow users to import their existing records into your budgeting app.
- **Make room for cash.** People are often paid in cash, pay in cash, and stash away cash.
- **Align time horizons.** Communicating the long-term value of small investments made now will help users understand the value of these investment behaviors.
- **Beware of mixed messages.** Avoid conflicting upsells, especially in budgeting and investment apps. Take care when choosing to offer products and make sure they can actually improve the lives of your members.
- **Ditch social.** Users were not inclined to share their financial practices with others in this way.
- **Treat apps as gateways** or stepping-stones to in-person financial services, not end points.

Rather than assuming that Gen Z and Millennial members are happiest with online modes of banking, this study suggests something more complicated: using PFM apps raised awareness but also raised many questions and left users wanting to learn more. Design PFM apps as gateways to developing deeper engagement with members and provide opportunities for app users to learn more from meeting with your financial advisers.

The Lessons of Fintech Apps
Design Matters for Personal Finance

CHAPTER 1

Introduction

Personal financial management fintech start-ups promise quick and easy ways for busy people to manage their money, from budgeting and saving apps like Clarity Money, EveryDollar, Level Money, Mint, Qapital, Wally, or You Need A Budget to investing apps like Acorns, Robinhood, or Stash. Many such apps also claim to promote good financial habits, and for many of their users, these apps may offer the only form of financial education that they have ever received. Younger cohorts—Millennials and Gen Z in particular—are typically the target market for these products. There are even savings apps geared toward children, which aim to help kids track and plan expenses around their allowance money, learning lessons about personal finance along the way.

Personal financial management apps may offer the only form of financial education that younger consumers have ever received.

But how well do such products work? What are people actually learning when they use them? And what else is being marketed to them as they do? At the same time, what lessons can credit unions learn from these apps to design digital and mobile channels that better serve people's complex financial lives?

To better understand how young people use personal financial management (PFM) apps and what financial lessons the apps may be teaching them, researchers from the Filene Research Institute's Center for Emerging Technology, based at the University of California, Irvine, ran a pilot study testing five fintech budgeting and investing apps with young consumers. The mobile apps tested include the budgeting apps Mint, Wally, and You Need A Budget (YNAB) and the investing apps Stash and Acorns.

As part of the study, 27 participants were recruited to complete a one-on-one interview, use a fintech app for a month, and complete a second one-on-one interview at the end of that month. This modified pre- and post-evaluation design had two experimental groups: experienced users and novices. Participants were drawn from students and staff at the University of California, Irvine. In the second part of the study, participants voluntarily opted into focus group discussions midway through the app-testing period.

The participants were aged approximately 18–34, and while many of them had been making an effort to gain control of their spending and finances, and a few even had individual retirement accounts (IRAs) or other kinds of retirement accounts, by no means did they feel financially secure. Our study thus represents a departure from typical approaches to fintech. While most reviews of fintech start-ups and apps focus on strategy and business models, drawing on interviews with founders and executives or marketing materials and business documents, we got a window into *users*' actual and messy experience.

The study was designed to illuminate the following three sets of research questions. (See Appendix 1 for the full list of interview and focus group questions.)

- **The use and usability of the apps.** How are people actually using these apps? Do they use them as intended, or do they find their own workarounds or ways to manipulate the app for other ends? How do the design and functionality of these apps shape users' experience and emotional responses when using them?
- **The educational strategies or curricula of the apps.** Are there commonalities across the apps in what they teach consumers, explicitly or implicitly? What else are the apps recommending or pushing to users? And how is use of the apps shaping user behavior? That is, having learned about finances from apps, what do users do next?
- **The apps' effectiveness with regard to people's existing financial practices.** Do the apps reinforce or contradict people's existing saving, spending, and budgeting activities and technologies?

Design Principles

1. Design for trust.
2. Design for financial instability and uncertainty.
3. Design tools that are adaptive, not prescriptive.
4. Make room for people's existing financial practices.
5. Make room for cash.
6. Align time horizons.
7. Beware of mixed messages.
8. Ditch social—or make it authentic.
9. Treat apps as gateways or stepping-stones, not end points.

The first part of the report reviews how the use of these PFM apps affected users' awareness and understanding of their finances and financial services providers. It focuses in particular on users' emotional responses to using the apps and their perceptions of trust or distrust toward the fintech companies and their primary financial institutions, whether banks or credit unions.

The second part of the report dives into the specific failures and frustrations experienced by users as they interacted with these apps. Most of the failures derived from mismatches between users' expectations or existing user behavior and assumptions built into the design of the apps.

Just as fintech companies have sought to insert themselves between consumers and their primary financial institutions, credit unions now need ways to reassert their relationship with members. The report ends, therefore, with implications for credit unions. It provides takeaway lessons—in the form of nine design principles—for credit unions to use as they develop and refine apps of their own, or work to identify suitable fintech partners to meet their members' financial needs. We have used pseudonyms for all participants in the study quoted in this study.

Why Personal Finance?

First, PFM tools have become big business. In the early years of the recent fintech start-up boom, payments took center stage, with companies like Venmo quickly growing their customer base through seamless peer-to-peer (P2P) mobile transfer, bill pay, and so on. Today, while Venmo and mobile payments remain important to consumers and investors alike, interest in PFM fintech has also grown dramatically. Budgeting, expense tracking, saving, and investing are all areas of growing consumer demand, and as consumer expectations have shifted toward instant, on-demand service, fintech apps have joined long-standing alternatives to banks and credit unions, like payday lenders and check cashers, in offering consumers not only a way to access basic financial services but also opportunities to pick up lessons about how to manage their money.

Second, the growth of PFM reflects a deeper set of changes, too. As financial insecurity has become more widespread in the face of increasing income and savings constraints, burgeoning debt, and deepening economic inequality, so too has financial well-being become more important (see, e.g., the Filene Research Institute reports *The Credit Union of the Twenty-First Century* and *The Case for Workplace Financial Well-Being*). Indeed, at the heart of consumer demand for financial services today is the search for financial stability and mobility. Financial well-being is not an add-on to basic financial services. It is, instead, the core reason why people engage financial services providers. That is, rather than being driven to financial institutions for core banking needs or to buy a specific lending product, people search out financial services providers that they hope will help them achieve financial well-being.

Rather than being driven to financial institutions for core banking needs or to buy a specific lending product, people search out financial services providers that they hope will help them achieve financial well-being.

Third, the rise of fintech has fragmented the financial services landscape. While consumers have long used diverse forms of money and financial tools, today consumers engage a variety of organizations—banks/credit unions, technology companies and start-ups, insurance companies, financial/wealth management advisers, alternative financial services providers, etc.—across multiple interfaces to piece together their financial lives. They often turn to PFM for a more holistic picture. In short, when it comes to PFM, even the banked are underserved.

Finally, as consumers increasingly attempt to reconnect more of their financial lives, PFM tools and companies may grow their access to consumer data—ending up with a large window on people's everyday spending and saving behavior, their evolving financial status, and much more. PFM thus poses important questions about how and why people trust such companies with their data—and how they are compelled to turn over those data.

—Taylor C. Nelms, Senior Director of Research, Filene Research Institute

Lessons Learned, Part 1: Effects on Users

In interviews and focus groups, we sought to evaluate the use of PFM apps by young people and what effects these apps had on their users. Users in this study agreed to adopt and use one of five apps over a span of one month. Three of the apps were budgeting tools (Mint, Wally, and You Need A Budget); two were investing tools (Stash and Acorns).

Mint

Mint is a personal financial "summary" tool that offers an overview of one's income and spending through syncing the user's account with its free mobile app and website. It also offers tools for budgeting and goal setting. Founded in 2006 in San Francisco, Mint received just over $31 million (M) in five rounds of investing before the company was acquired by Intuit in 2009 ($170M). Mint makes money through advertisements, referrals to financial products (like credit cards), selling aggregated user data, and a paid version that offers premium features (like credit monitoring). As of 2016, Mint reported having more than 20 million users.

Wally

Wally ("Wally Next") is a basic budgeting app that allows users to compare their income with their expenses. Wally does not require users to link their accounts with the app, instead relying on the manual input of data. One of the app's unique features is that it allows the user to take and store photos of receipts. Headquartered in Dubai, Wally was released on iOS in 2013 and celebrated for its high-star ranking globally in the App Store; it has since expanded to Android. The app has raised $450,000 in one round of angel investing (2014). Wally is free, but offers in-app purchases ranging from $0.99 to $44.99.

You Need A Budget

You Need A Budget (YNAB) is a web-based budgeting software that works across different smart devices. YNAB focuses on proactively nudging users toward expense planning and making better spending decisions (rather than only retroactively summarizing users' expenses); it also offers reports. Its budgeting method centers on zero-based budgeting (what it calls "giving every dollar a job"), which is articulated in regular free workshops and even a book. YNAB offers a free 34-day trial, and the yearly cost of the software is $84. Founded in Utah in 2004, the company yields an estimated $2M in revenue annually.

Stash

Stash is an investment app designed for beginners that guides users through selecting a portfolio of stocks and exchange-traded funds (ETFs), all the while "coaching" them on selections and guiding them toward educational content (if, say, the user's portfolio is not sufficiently diversified). ETFs are structured thematically around a wide range of identity- and interest-based categories, including "Do the Right Thing" (socially and environmentally responsible companies), "Clean & Green" (clean energy sources), "Corporate Cannabis" (legal marijuana industry), and so on. Stash was founded in New York in 2015 and has obtained over $189M in funding over seven rounds. The app makes money through a monthly fee ranging from $1 to $9, depending on the plan users select.

Acorns

Acorns is a small-dollar investment app that rounds up a user's purchases to the nearest dollar and then distributes that so-called spare change across ETFs through a partnership with Vanguard. Acorns has a feature called Found Money, which offers users cash back for purchases made by shopping with partnered brands. The app was founded in Los Angeles in 2012 and has yielded $207M over 11 rounds of funding (including from some celebrity investors, like Jennifer Lopez and Alex Rodriguez); the company was acquired by Vault in 2017. Acorns has more than 4 million users and makes money through account management fees at price levels ranging from $1 to $3 a month.

Our questions and observations focused on three areas: basic functionality (use and usability), perceived effects in terms of financial education, and perceived effectiveness, with special attention paid to how the apps fit into (or did not fit into) users' existing approaches to money management.

In this section, we review how the use of these apps shaped users' awareness and understanding of their finances and financial services providers. We focus on the trust or distrust users reported toward different financial services providers, from these fintech companies to their bank or credit union. And we dig deep into users' emotional responses to these apps more broadly.

Emotions elicited by app use are central to understanding how users experienced the app. For one thing, many PFM apps build in colors, sounds, and rewards-like point systems to nudge their users' behavior by eliciting an emotional response. Moreover, the degree, duration, and balance of negative and positive emotions experienced can serve as an index of likelihood of sustained app use. Different aspects of the app use process elicited a variety of emotions. For instance, while many people were excited about using an app to track their spending, complex onboarding processes resulted in users being overwhelmed, frustrated, annoyed, and confused. Being able to work through the obstacles that elicited these emotions was crucial to an overall positive experience.

I was initially excited about the potential of the app. And I was like, oh, I'll be checking it and seeing, you know, this rise, even if it's a few cents. But **the reality is that it's frustrating and disappointing** . . . like when it does get disconnected by your bank account or something like that. (Mary, Acorns focus group, emphasis added)

Key Findings:

- Design matters, because it signals competency and promotes trust.
- Apps can enhance awareness of personal finance and increase users' sense of transparency and control.
- Apps can foster fixation on users' credit scores through FICO gamification.
- Apps can act as gateways to other sources of personal financial information and advice—including banks and credit unions.

Design Matters, because It Signals Competency and Promotes Trust

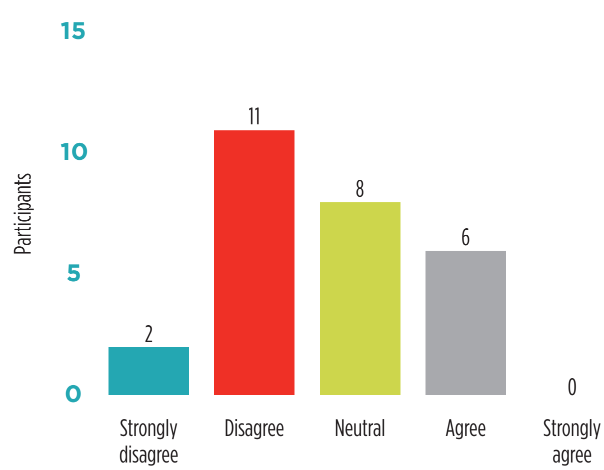
I hate traditional financial institutions. I trust traditional financial institutions.

Reports of young people's distrust of institutions of all kinds, including financial institutions, are widespread. As CB Insights (2019) has written of Millennials, for example, "They have a deep antipathy to traditional financial institutions." Our results suggest the relationship is more complicated. Users in this study expressed a range of opinions and practices around the question of trust. Rhetorically, young cohorts may express disgust, distrust, or disappointment toward banks. But when it comes to (1) whom they trust with their data, (2) whom they want to do serious financial planning with, and (3) who they think will be around over the long term—the time horizon for which we found they really wish to plan—traditional financial institutions are still preferred.

In fact, our data contain good news for credit unions and banks: study participants placed more trust in traditional financial institutions than in almost any other financial services provider or technology company, or any of the apps. For example, users did *not* generally trust technology platform companies to be good stewards of their personal data. Amazon, Google, Facebook, and the like were seen as untrustworthy custodians (see Figure 1).

FIGURE 1

I TRUST TECHNOLOGY COMPANIES (AMAZON, GOOGLE, FACEBOOK) TO PROTECT MY DATA AND USE IT RESPONSIBLY



Even banks with reputational challenges received high marks from participants. This may be, in part, due to inertia or even resignation to the fact that the banks have much of their information already. But even our respondent who banked with Wells Fargo and was aware of the bank's legal issues still felt that, at the end of the day, they would rather walk into a branch and talk with a person at the bank than use an app.

> I don't really know [why I trust my financial institution]. **I know this is Wells Fargo, and people are like, Wells Fargo is trash, they'll take your money. And I'm like, I know. But the person who would always help me was really cool. He's a great guy who helped me with all my cards and bank account and working everything out. He was a great person, so I trust him.** Yeah, I guess it's a good face, a person like that [that made the difference]. I'm sure if I had a really bad experience with a bank or whatever, then I would change it. But because the person I met was pretty cool, I'm like, okay, I trust you guys, I guess. (Courtney, Stash user, emphasis added)

> I saw an article that was like, "Why you should trust Stash," but you could only view it after you like give them your social security [number] and everything like that. So it was like, isn't that a little late? (Eric, investing focus group)

> When I looked at the reviews, I thought it was pretty low. If I remember correctly, I think it was two, maybe two and a half, three stars, which when you're dealing with my money, I want like five stars. (Victoria, Acorns focus group)

What banks and credit unions ultimately offered study participants was trusted guidance, stability—especially over long time horizons—and, importantly, personal interactions that participants continued to value, despite their generational predilection for online, all-the-time digital, or mobile access.

What banks and credit unions ultimately offered study participants was trusted guidance, stability—especially over long time horizons—and, importantly, personal interactions that participants continued to value.

At the same time, banks and credit unions were considered failures at the mobile experience. Their own apps were panned, or, alternately, users expressed the concern that if the credit union's or bank's app did not *appear* to be high quality, it would lead to an erosion of trust.

> I feel like the IT departments of some big banks kind of suck a lot, like [Citibank's] system. So then because of that, I feel like it would be less competent than a fintech, if it was a fintech company that managed it. I feel like the data would be better managed and less likely to be—well, they'd have better security and protection of the data. [That] kind of thing. But the actual features and the UI [user interface] and how everything flows I feel like might be lower quality. (Vernon, Stash user)

The fintech apps they used and evaluated, on the other hand, were nicely designed. As we will see, even when the apps did not work the way they were advertised, participants liked their layout, colors, graphics, and interactivity. Our users gravitated toward designs that were minimalist and clean, included plenty of white space, narrowed the features or choices in the app, and used good and appropriately referential colors (e.g., Mint's distinctive green, which users associated with money). This does not mean that their experience was always "nice." The apps also often caused anxiety and stress—but in some cases, the users recognized that this was an intentional part of the apps' design. Nonetheless, participants appreciated intentional design and high-quality aesthetics.

Good design begets credibility. Marketers have long recognized this; the Nielsen Norman Group, for example, describes how to bump up credibility through website design quality, up-front disclosure of customer experience information, comprehensive and current content, and connection to the rest of the internet (Harley 2016). But empirical studies have also shown that people often rely on design features to evaluate the trustworthiness of websites and information online. One classic study collected comments on the credibility of health websites from more than 2,600 people and found that the "design look" of the website was the most frequently cited reason for trusting (or not trusting) information found on the website (Fogg et al. 2003).

Just as in the past, the neoclassical columns and imposing, temple-like architecture of financial institutions signified permanence and stability, today's mobile gateways to financial services must incorporate design elements that, in this new, digital space, connote competency, stability, and trustworthiness.

Just as in the past, the neoclassical columns and imposing, temple-like architecture of financial institutions signified permanence and stability, today's mobile gateways to financial services must incorporate design elements that, in this new, digital space, connote competency, stability, and trustworthiness.

Apps Can Enhance Awareness of Personal Finance and Increase Users' Sense of Transparency and Control

While many PFM apps explicitly tout their ability to educate users about how to manage their money, the effect of using these budgeting and investing apps for research participants was less a matter of increasing their financial literacy or enhancing their education than of *raising awareness*. Indeed, most of the participants reported that their use of the apps had made them more aware of the importance of saving and investing. Mint users received insight into their credit scores, and successful onboarding and regular engagement with tracking and budgeting apps resulted in users getting a window on their spending behavior—especially their discretionary or self-identified "impulse" spending. Some participants reported increased awareness of how much they were spending on discretionary meals and entertainment; others reported moderating food purchases, like snacks.

> I am definitely way more conscious about where my money is going. (Courtney, Stash user)

> [I am] generally being more aware and less afraid of money and money decisions. (Sandra, Mint user)

> I did notice that my money started going toward more, like, eating out with friends or, you know, entertainment, like movies [or] video games. (Tim, Mint user)

> I feel like I'm more accomplished, I guess you could say, like I'm doing more for myself. (Emily, Wally user)

> I did it [tracked expenses] but not regularly. I used to use a notebook. But I wasn't very organized. And I think I've become more organized with the application. (Priya, Stash user)

Users' increased awareness about their personal finances resulted in both positive and negative feelings. The apps also created an *emotional echo chamber*: many participants reported preexisting feelings of frustration and stress with their money, and the apps reinforced that frustration and stress. Sometimes this was unintentional (due to flawed categorization schemes or poor functionality linking and syncing accounts, as we will see below); other times it was intentional, as it was built into the design of the app itself. Colors in particular were important cues that influenced users' experience.

> [I was] happy that I didn't go over budget . . . just seeing the colors remain consistent on green but not going yellow or to red. . . . The yellow, sometimes that stresses me out, because I'm like, I know that I can go over budget, but having these set limits sometimes just feels stressful. (Tom, Mint focus group)

> Mint stresses me out. The budgeting especially stresses me out. **Monitoring my finances doesn't stress me out, but the budgeting stresses me out,** because I feel like it fixes me into categories. I used to have it on my phone, and then I stopped having it on my phone. . . . The notifications stressed me out. To some extent I enjoy having my finances systematized, but I don't like the constraints of the system. I just like the kind of statistical analysis that Mint provides, without the stressful notifications. (Jake, Mint user, emphasis added)

Overall, in generating more awareness about users' everyday financial behavior, these apps also led some users to despair that they would never reach their goals.

> [I experienced] depression, frustration, just how broke I was. I do feel that. **I just feel like I'm really frustrated. Like, oh my God, why can't I have more money?** It's really annoying. I don't know, [it's] just very frustrating that I wish I could do more. (Mateo, Acorns focus group, emphasis added)

The investment apps, meanwhile, were mainly a disappointment to participants. For users of these apps, tracking the progress of their investments on a regular basis was associated with mood shifts depending on performance. In fact, use of the investing apps led to self-reported "addictive" behavior as users would check on their investment accounts throughout the day.

> And then also [there's] the disappointment of actually seeing the day-to-day fluctuation where you're losing a few cents. Like, yesterday you gained five cents, but now your total gain is only two cents. . . . My other investing I pretty much only check once a year, and so usually I can see some gains on that over the course of the year, which makes me feel positive. (Mary, Acorns focus group)

> Like with the Round-Up thing [a service offered by Acorns to invest spare change by rounding up purchases on a linked account to the nearest dollar], since getting the app I actually haven't made a lot of purchases. So it didn't round up to my bank directly. But in this function where it's like, oh, we found these things for you to round up from. And I was just curious: Is one cent, two cents okay? I just kept tapping, you know, because it's kind of addicting to see a bar with the amount up to $5.00. And I was like, what does that five do? I just kept tapping and nothing happened, and I wanted to just keep doing it. . . . When you do it there's no undo button, where it's like, oh, I actually didn't want to do that, my bad. (Mary, Acorns focus group)

> I check the app. . . . It's just another thing that I check now. One time, for example, I was trying to focus on something, and I was like, oh, I'm going to delete my social media accounts. And I found myself checking the app more, the Mint one. So I guess in that sense it's just like [any other] phone app that could become addictive. But [it's] not super [addictive], because it's [also] kind of boring. (Hannah, Mint user)

Some respondents indicated that the gamelike qualities of the apps resulted in a kind of detachment from the fact that they were dealing with their money. The gamification of savings made the app seem like "just another app," not a trusted source of insight into a crucial area of their lives.

> It seemed more like a game. . . . The whole round-up thing, when you can add cents to round-up and add it to your investment. For me personally, I didn't think of that as money being withdrawn from my bank account. [Instead, it was] just kind of like, oh, here's some extra money that I can invest. I didn't think about it like, oh, this is money you could've spent on something else. It seemed more like another app, or like another game kind of thing. (Victoria, Acorns focus group)

On the more positive side, the apps gave users a greater sense of transparency and control, especially when it came to understanding where their investments were going and what effect they might have on the wider world. Some users, for example, reported wanting to know more about how their savings and investments were allocated, what companies they were supporting, and generally how their money was being used. They found the investing apps to be more transparent on this front than their banks or credit unions.

At Schools First, talking about retirement planning, things like that, you don't really know where your money is going into, but with Stash, you're able to select what type of investments you want to go into. So it's clean energy or equal rights organizations. You can select what type of, I guess, savings account you would want to contribute to and then you're able to easily invest, you know. (James, investing focus group)

Apps Can Foster Fixation on Users' Credit Scores through FICO Gamification

Intentionally or not, budgeting apps fostered an attachment to credit scores among users. Perhaps because the process of categorizing expenses was cumbersome or because of explicit offers of credit card products as users' credit scores changed, users started paying attention to their credit score. If customizing the budget categories caused stress, watching one's credit score provided a kind of emotional reward.

In particular, Mint's gamifying of FICO scores and linking those scores to seemingly personalized credit card offers got users interested in understanding their credit score better and improving it. Several participants reported registering the credit card offers they received as they met various credit score benchmarks.

[Mint has] an overview [of the credit card offers]. They tell you like, "This is a good credit card." They give a lot of good recommendations for credit cards . . . based on like, oh, this might be good for you. And they give an overview of what type of fees and stuff [apply to] that credit card.

Interviewer: And is it personalized for you?

That's a good question. I feel like it might be, because they do have a credit score on me. So it might be able to hone in on that. Like, oh, yeah, your credit is this and that, so you might want [this card]. Because I remember at one point, my credit score wasn't great, so I think they were giving me the credit cards that were more like, oh, this is good for credit score levels of this and that. (Tina, Mint user)

Interviewer: What kind of ads do you get? (Mint focus group)

Tom: Within Mint, it's mostly financial things, so credit cards a lot. They'll be like, you spend a lot on, let's say it's hotels, . . . here's this credit card that has good benefits for hotels. Things like that.

Lexi: Yeah, or even like, I get loan refinances for student loans and stuff. I get those a lot from Mint, too. Just like their emails actually, but not too much through the app.

Although users often complained about the number of credit card ads they received, their use of apps not only made them more aware of their credit score; it also compelled them to think about the score they should aim for if they wanted to live a certain lifestyle.

I don't have an APR, like the APR that I *need*. (Stephanie, Mint user)

Ultimately, the apps offered users opportunities to reflect on their current financial status through the lens of their credit score, prompting them to think about what next steps to take to improve their status.

Apps Can Act as Gateways or Stepping-Stones to Other Sources of Personal Financial Information and Advice—Including Banks and Credit Unions

One especially interesting finding of this study is that, while many users were unsatisfied with the information or guidance they received from the apps themselves, their increased awareness of or attention to personal finance led them elsewhere.

For some users, the apps they used simply led them to explore online (YouTube was commonly cited) or to look into other apps. Several subjects reported starting with one app and then adding Mint.

I think it makes me curious about using other kinds of apps in ways that help me learn about how others do things, see if that's a way that I would want to do things. . . . I'm now really curious about other financial services and apps that are out there. I had one advertised to me this morning that seemed interesting. It was a savings app . . . [and] more than one person can put information into it. So, say I wanted to save up for a vacation or a down payment on a house with my partner, we could share that information in the app without merging our bank accounts. (Sandra, Mint user)

Many participants, however, decided to visit their bank or credit union to learn more about topics they were introduced to through their apps, such as investing or retirement.

> [Stash] has given me a perspective on financial planning and how to, again it was kind of like a gateway for me to think about my finances and what are my options. (John, Stash user)

> [I learned that I] prefer an old-fashioned way of investment. I think that's what I learned from this. (Priya, Stash user)

Finally, for still others, the apps served as a gateway to better personal money tracking without the use of apps.

> I think the app posed some suggestions on how to track your money for me, where I didn't know what I was doing at all in the beginning. But those suggestions made me think of the ways I want to do it, that the app is not doing it. So **it gave me a starting point, and then that made me think of how I would ideally track my money.** I think . . . I would keep a notebook of things and do pretty much the same thing, but I wouldn't like categorize [income or expenses], for example. . . . But then again, because [the app] categorized, that makes me think of, well what categories would I use? That's not necessarily the kind [of categories] that they would use. (Jenna, budgeting focus group, emphasis added)

CHAPTER 3

Lessons Learned, Part 2: App Failures and User Frustrations

We also sought to understand how people actually use these apps and any potential obstacles or challenges they encountered as they attempted to incorporate the apps into their existing financial practices. Answering this question entailed assessing what users were doing before using such apps: how they kept track of their money, whether they budgeted at all, and whether they thought about, and acted on, investing money for the future.

The participants in our study were eager to see what these apps could do for them. They all entered the study excited to try a new way to manage their money. They were, for the most part, disappointed. In this chapter, we outline areas where the apps fared poorly, and we include cautionary tales for credit unions as they create their own apps or look to partner with fintech providers. We found that the biggest problems reported by users of these PFM apps had to do with their outright failure to function sometimes (particularly with respect to account linking), the mismatch between the apps' implicit ideal user and the actual user, and their sending of mixed messages; moreover, some of the apps' features did not land at all with users.

The participants in our study all entered the study excited to try a new way to manage their money. They were, for the most part, disappointed.

Failures and frustrations:

- Users expect seamless functionality, and interoperability failures threaten user retention.
- PFM apps have difficulty with the complexity of people's real financial lives, including irregular income, the use of cash, existing accounting practices, and P2P payments.
- In-app promotions, rewards, and advertising send mixed messages that confuse users and undermine trust.
- In-app financial education is often poorly designed and ineffective.
- Users have no desire to use social media features of PFM apps.
- The time scales of PFM apps do not match people's future-focused aspirations.

Users Expect Seamless Functionality, and Interoperability Failures Threaten User Retention

Most of the participants reported difficulty linking their existing accounts to the apps. Users of the investment apps faced particular challenges. After multiple attempts, some thought they had successfully linked their accounts, only to find expected transactions had never taken place. The apps also did not sync with their accounts as quickly as users expected; indeed, since it was an app, users expected instantaneous, real-time syncing after entering their account information.

When you log in, it's green, and there's a tree branch, and it says like, "from acorns, mighty oaks do grow." So it's really positive, really motivating. Like, yeah! And then you open it, it loads, and it's like, zero zero zero. It's like, please finish connecting your accounts. I'm like, I did that three times already. Aesthetically, it's pretty nice, but no. **There's a point at which functionality usurps however pretty it might be.**
(Jen, Acorns user, emphasis added)

Acorns Focus Group

April: It was fairly easy [to set up Acorns]. You had to enter your information, and then you had to do the Round-Ups [and] sync a bank account. So for that, they deposited, I think, a small amount of change, and then you just had to verify through that. For me, the setup was easy, but then after I'd been using it for a bit, somehow it disconnected from my bank account.

Victoria: Yeah, that happened to me, too.

April: Yeah, and so I didn't realize [that it was disconnected] for a while. So obviously, I didn't get the round-ups from that time, and then I tried to reconnect it. And **I tried to reconnect it like three times, and it didn't work.** And it worked the fourth time. So now I'm back on track (emphasis added).

Victoria: Oh, I thought it was just me. . . . I only had to try it twice and it made me do it two more times. . . . I actually had downloaded the app [before], and then I guess started to set up an account back in the day, and since then I've used new email. So when [they] asked for my social security number, they said, "Hey, it's still linked with another one." So I had to go through that whole process of going back to my old email, resetting it up. I linked my account; it said, "Congratulations." I made some purchases; nothing happened. And then I tried, and then it wasn't connected. I linked it again, it said, "Congratulations," and I tried today or yesterday, and the same thing. So nothing has happened. It deconnects itself somehow. But I always get the confirmation: "Congratulations you're all set." So I thought it was just me.

Mateo: For me, it was a harder process. So I thought I was putting in my password wrong, because then it says something about my bank account, but I guess I was doing it right. . . . I think I did it about seven times, and it just wouldn't let me go through. So then it gave me the other option to do it manually. You put in your bank account number, and then you put in a routing number, and then after that, after I put that information in, they made me send in an ID. So I sent in my ID, and that took about two days for processing. And then after that, it linked my bank account. And then after that, it disconnected my bank account. And then after that, I had to redo the same thing over, and then I was able to link my bank account. Which was fine, and then it wasn't able [to] start the round-ups.

Victoria: What are the chances? I just thought it was me.

April: But it was really frustrating. . . . There was no notification to you that it's been disconnected. I had to be logged back in and check. . . .

Mateo: It's not that I was concerned, because I felt like there was going to be some kind of accountability. It's more like, wow, there shouldn't be this much error in an app that's so well known to do something. . . . I kind of figured like, okay, maybe my information isn't going to be sold off anywhere, but I did figure like, you know, if you're such a reputable like app, you shouldn't have so much error in your application itself—just to log in or just to connect. **If your main function is to transfer money, that shouldn't be the main error. Your whole point is to use money, so that shouldn't be the struggle of it** (emphasis added).

CB Insights (2019) reports that even the best PFM apps retain about 70% of users after three days. CB Insights puts a positive spin on this. But to us, it only underscores how poorly some of the apps performed—given that it took some of our participants days to sync their bank accounts, provoking questions about whether it was actually a reputable service. The takeaway message: if your app does not work instantly and consistently, users will not stick around.

If your app does not work instantly and consistently, users will not stick around.

PFM Apps Have Difficulty with the Complexity of People's Real Financial Lives

PFM apps work best when they include as much of users' financial lives as possible; they rely on users to feed them data about income, expenditures, and so on—and to add metadata to describe or earmark those funds—in order to accurately visualize and categorize cash flow. Budgeting apps like Mint, Wally, and YNAB in particular expected users to incorporate all of their accounts into the app. Yet most users had a difficult time with these demands, for a variety of reasons. The result was that many users became frustrated with the apps' expectations and judgments about their money management.

> I'm going on vacation for spring break, and so this month looks like I'm spending a lot more. But that's coming from like my savings. So [the app's] like, you're broke, [but] I'm like, I'm not, no, it's okay. (Emily, Wally user)

Irregular Income

Most of our research subjects were young, and many were also students. As such, they had variable incomes from multiple and often irregular sources, and they participated to varying degrees in informal economic activities, like babysitting or sharing housing expenses. Yet these apps were designed with the assumption that their users would have regular incomes and expenditures. Our participants—with their variable expenses and highly irregular income flows instead of regular, biweekly or monthly salaries—had a difficult time dealing with this assumption. Even for apps with workarounds, the default was for users with regular income streams, which meant the irregular income user had to do extra work to configure the app to suit their needs.

> The income section is [confusing]. Because I'm not a salaried person. . . . I don't know how they have programmed four squares where it says, income this much and you are spending [this much]. I don't know how exactly it works. I've only used the income side to keep a track record of all the scholarships and the grants I received. So the balance they're showing is not correct, because it doesn't match the expenses and grants. But I entered it so that I know how much I received from the school. [Even] apart from that, . . . the income section was not that clear, how it works. (Charuka, Wally user)

> [My income is] based on how many hours I work, and then tips count as salary, but I don't know what I'm going to get. And I don't pay any of these bills. Cable, water, and electricity are irrelevant anyways, because it's incorporated in my rent. So if I paid for everything, I'd only use rent, phone, not internet, or sometimes they charge you and use that account, but it's not a monthly thing. (Emily, Wally user)

> Trying to deal with variable income [was a challenge]. . . . You Need A Budget did send out a really cool email about how to work with variable income. It was actually pretty detailed. It would be like, oh, you have variable income, here's how to work with this. And then you'd go to a web page where they had a full tutorial on how to do it. (Giang, You Need A Budget user)

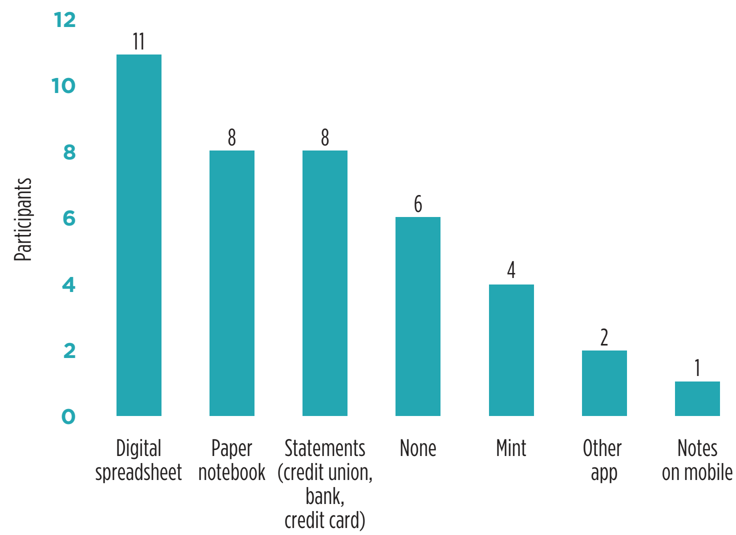
Existing Accounting Practices

While users were excited about the opportunity to try these fintech apps, most of them already maintained a hodgepodge of existing accounting tools and systems: digital and physical spreadsheets, paper notebooks, bank statements, and cash. The apps systematically failed to recognize and accommodate these existing practices effectively.

We were surprised by the range of existing accounting practices people employed (see Figure 2). For example, digital spreadsheets and paper notebooks were very common budgeting techniques. A few participants mentioned logging in to their online accounts to check their balances. Others did very little beyond basic mental accounting to track their expenses. For almost all participants, it was clear that even if they were not actively recording their expenses, they were monitoring spending to some extent.

FIGURE 2

PARTICIPANTS' PRIOR ACCOUNTING METHODS



> What I do is, for each year I have a separate Excel [spreadsheet] and see how it goes. (Natalie, budgeting focus group)

> I have some investments back home. We have made deposits. So it's a once-a-year thing. I don't have to look at it every month. I keep [a] record of account numbers and the capital and the interest rates the bank gives and the amount I get. And after that, I have another column to indicate the tax withdrawal from that and then the renewal. So that's the worksheet I've maintained, that's the main thing. It's in an Excel file. Daily expenses? I try to write them down or collect the bills and do something at the end of the month [in a diary]. It's not a proper way, but yeah, I do balance it. . . . So I try to keep track of all the expenses, I do. Like, what do I spend for food, books, and everything so that I know how much I spend each month. (Charuka, Wally user)

I used to just keep track of expenses manually, and I still do that, I think just because I don't know if I'm going to necessarily keep the app, and so I didn't want there to be a month gap in my money records. I mean, [the app] helps to give me the visual of what my money's going towards, and what I can project for the next month. But as far as entering transactions and stuff, that is kind of redundant, because I'm already doing that by hand. I have a notebook actually. Very old-school. . . . I think it's just what makes sense to me. It's easier for me to work with numbers if I'm writing them by hand versus typing them into a computer. (Vanessa, You Need A Budget focus group)

I feel like I do pretty well budgeting. . . . My parents mostly pay for my rent, and then I have my own savings for my spending money. . . . I don't work through the school year, so I know not to spend as much as I would during the summer, when I'm working. I try to budget a weekly or a monthly [amount]. Sort of like a mental thing. And then I notice if I go out too much one week, I'll try not to go out or spend that much money the next week. I just check my bank account, or write in my notes, okay, I already went out four times this week, so don't go out too much next week. I don't want to go out anymore. (Alejandra, Wally user)

Many users appreciated the control, freedom, flexibility, and straightforward visibility of the simple spreadsheet. Digital and physical spreadsheets, paper notebooks, bank statements, and cash together signal an attachment to visible, if not always physically tangible, methods of managing money. Even Excel and Google Sheets represent a way to make visible one's financial activity that remains—at least ostensibly—private and belongs to the user only, with changes possible only if the user makes them directly.

I think I have a better understanding of why it's hard to budget, especially just looking at my own spreadsheet method, where I enter in everything manually, calculate everything manually. Trying to budget for long-term items over the course of several months, that would get really complicated really quick, at least using my own method. So I want to look into the process of budgeting first to find out how to budget better for myself and then go after the tools. The way I look at You Need A Budget, it's really great if you spend money on a lot of things, whether it's rent, house maintenance, stuff like that. It makes sense to use You Need A Budget when you have to spend on a lot of things. But as a student, I feel like I could still keep it within a spreadsheet. (Giang, You Need A Budget user)

For me, I didn't want to link my account at all, because I wanted to configure it manually myself. . . . But I couldn't really get that to work, because my bank has, I guess, a limit in how many transactions you can input. So what I did was, I manually entered in my bank balance and then started to budget for several categories. But yeah, the way I usually track transactions was, I do it in like a Google Sheets, but I was behind on that, so I've been entering [my budget] into You Need A Budget. (Noah, You Need A Budget user)

The Persistence of Cash

We were also surprised by the resilience of cash, particularly as a method of saving. Several of the research participants removed money from a general pool of available funds by hiding away a store of cash.

I get my tips in cash, because I'm a server, so I've started taking a percentage of my paycheck or tips and putting them away in cash. I tried to do the savings account, and then I had to get money out of it, and I keep on seeing it, so it's hard not to touch it. I actually just bought a cash safe box. I'm paranoid. I'm not going to keep it in my socks. I think it's a common thing that people do put cash away. One of my best friends, she actually put money in a drawer that's hard to open. It's not like a safe, but that's what she uses. (Emily, Wally user)

But just as the apps were not configured to deal smoothly with irregular income and expenses or incorporate users' existing budgeting systems, the apps could not handle users' cash practices. This was especially true of the practice of sequestering funds in the form of cash as a means of saving. Those "savings" looked to these apps like an unexplained depletion of funds.

Just as the apps were not configured to deal smoothly with irregular income and expenses or incorporate users' existing budgeting systems, the apps could not handle users' cash practices.

> The only hard part was considering cash, because it's not in my bank account, but it's obviously income. . . . I get my tips in cash. So I think the newer Wally app probably has the cash aspect, but the one that we're using doesn't. (Brooke, budgeting focus group)

> The reason why [the app can't track my budgeting] is that the way that I budget is [this]: if I receive *X* amount every month, I put in an amount less than that to budget with. For instance, I'll do something like, if I'm getting a thousand dollars, I'll put in five hundred, so that's my budget to work with. So the figures of the budget and the figures of the bank account don't always match. That's one [reason]. The second is, sometimes I'm a bit lazy. For instance, I might not want to check the exact debit on my debit card, like for laundry. I know it roughly costs about four dollars for each cycle, but I just put in five, because I want to put in a few dollars more than necessary. . . . Sometimes if I've done groceries, and I'd forgotten to do it two days ago, and I know it's vaguely twenty-six dollars, but I might have spent twenty-eight or something, I might just put a rough figure. So it's more to do with laziness and the fact that I'm using a certain amount which I'm budgeting with. (Priya, Stash user)

Cash is simply not disappearing, despite many predictions to the contrary, but its use may be changing, and PFM apps must take cash flows and savings into account. This finding echoes data from the 2019 Diary of Consumer Payment Choice study by the Federal Reserve System, which shows that cash is heavily used for small-value payments and that "the share of cash use among individuals under 25 years old is the highest of any age group."

P2P Payments

Finally, users experienced particular problems with Venmo, which was among the most common payment methods employed by participants. The apps tended to treat Venmo payments as one kind of inflow, lumping all Venmo payments into one category based on transaction history, despite the fact that users made and received Venmo payments for transactions as diverse as babysitting, paying or splitting rent, sharing grocery bills, paying for entertainment, and dining. If users adjusted or created their own categories to handle a specific Venmo payment, at least one app (Mint) subsequently treated all Venmo payments as that category.

The problems participants had with P2P payments through Venmo offered a key example of the kind of false assumptions the apps made about their financial lives.

> Sometimes the apps are kind of too smart in terms of making assumptions about stuff, in a way that I found really frustrating. Like when I used Venmo, it automatically categorized it as babysitting or something. They [have] default settings that you then have to go back in and change in a way that I quickly realized didn't make sense for me to spend time doing. When I had Excel budgeting habits, that worked fine for me. So I just didn't bother recategorizing those kinds of expenses. I stopped using it for budgeting or paying much attention to that. What I did use it for was, and I did this in an effort to start using it for budgeting, was I included all my accounts on it. Except for I have an IRA, an investment account, that I just don't ever touch. And it's like out of sight, out of mind on purpose. . . . [The app will] give me alerts about, like, you've spent an inordinate amount of money in this category or something. I didn't put [in] that category, but I still feel chastised by it. So I think I have this response to it where, maybe I should just go in and change or delete the budgets so I don't actually feel like it's judging my financial decisions based on really arbitrary categories that don't apply to me. Like, you spent too much money on babysitting when in fact, I don't have, I never paid a babysitter. (Sandra, Mint user)

There is a deeper problem with these miscategorizations than poor user experience. When apps failed to identify income and expenditures correctly, they also then failed to understand a user's true financial status, potentially providing faulty advice as a result. Indeed, the apps monetize their services in part by recommending products to users based on their financial histories. But as the experiences of research participants show, the categorization of transactions in practice is not particularly accurate to people's financial activities or standing. In short, if the data fueling the business model of PFM apps can be very noisy, the app might not know the user as well as its designers imagine.

When apps failed to identify income and expenditures correctly, they also then failed to understand a user's true financial status, potentially providing faulty advice as a result.

In-App Promotions, Rewards, Recommendations, and Advertising Send Mixed Messages That Confuse Users and Undermine Trust

Even when it was accurate to users' experiences, the advertising offered up by these apps proved to be confusing—ultimately undermining user satisfaction. Research participants often commented on what appeared to them to be mixed messages they received from the apps' promotions, rewards, and recommendations. These mixed messages were present across all the apps, but they were especially prevalent on the investing apps. Some offered reward points or promotional benefits for making purchases with particular companies. Acorns, for example, offered to double users' round-up investments if they bought concert tickets with Ticketmaster. Stash advertised special offers tied to purchases at specific restaurants and retailers. One user realized they could "earn more" with Yelp, which provides similar offers, since Stash takes a percentage of the cash that would otherwise go back to the user.

These offers gave people pause. The apps were ostensibly trying to help users manage their money but then "rewarded" them with promotions that encouraged the use of specific payment cards at particular locales, incentivized them to get a loan, or made recommendations to apply for a new credit card. That is, the apps appeared to be incentivizing the very spending that users are becoming more conscious about and trying to curtail.

The apps appeared to be incentivizing the very spending that users are becoming more conscious about and trying to curtail.

> It was contradictory. I mean just like, okay, first of all, I can't afford to eat, I'm trying to invest and make money and not shop, you know? So it was just really weird. I didn't feel like it was comfortable. I feel like if I was going to try to do something like that, that's not the way to go: you know, offers. . . . For me, I just didn't feel like I'm going to be offered a shopping experience while I was trying to invest my money. The whole point was to make my portfolio grow and not, you know, [spend it]. They wouldn't have that on an E*TRADE app or it wouldn't have that on a bigger investment company, like with Charles Schwab, they don't do that. (Mateo, Acorns focus group)

In-App Financial Education Is Often Poorly Designed and Ineffective

Some of the apps also attempted to educate users on budgeting or investing, but again, failed. Informational articles provided through the apps were simply too long or involved.

> I remember the articles were very like, it felt like you were reading like a *New York Times* article or something that has the name of the author, something like that. And it's like, oh, this is how you do this and that. It felt more like an academic thing. . . . It felt like a lot of work. I do want to [spend time on the app, read the articles and videos], but I can't allocate time to prioritize it. So it's just really frustrating. Me having to completely educate myself like starting from scratch. It was kind of annoying. (Mateo, Acorns focus group)

Instead, we found websites like Reddit and YouTube to be trusted, go-to sources for information not only on financial planning but also on the fintech apps themselves. YouTube was especially popular. Many participants turned to YouTube videos when the apps could not give them the information they wanted or when they needed to learn more about an unfamiliar term or financial subject.

> Yeah, [I YouTubed things] to make it easier on myself, because I didn't want to read all the articles. (Tom, Mint focus group)

> I would say the hardest part for me is because they give you so much freedom to pick what you want, it was like figuring out what I wanted, and I didn't really know what to invest in. I was like, okay, this is interesting. In order to figure it out, I had to watch some YouTube videos or go online and look up the app. It kind of broke it down for me there. (Sara, investing focus group)

Users' responses suggest that short, helpful informational videos may be more effective in financial education than the text-heavy articles some of the apps provided. That said, the fact that YouTube is a trusted source in this domain might suggest that credit unions developing their own informational videos to accompany mobile or app-based services should simply use the existing platform and put their videos on YouTube.

Users Have No Desire to Use Social Media Features of PFM Apps

New fintech apps frequently incorporate a social media or sharing feature, inviting users to sync their existing social media accounts in order to connect and compete with friends and contacts for better credit scores or to meet savings goals. But none of the users in our study used the social media capability of the apps where provided, and market research suggests that such features are generally unpopular. As CB Insights (2019) puts it, a PFM app "doesn't get better at managing your money the more friends you have using the same budgeting app. And you're not likely to 'share' your bank balance or post it to Twitter, either. Your personal finances are personal." This accords with our findings. There were implications beyond the social media connection, too. For example, Stash gamified reading educational articles by assigning points to the articles that users completed, but since users did not connect with their friends through these apps, there was no point to earning points.

None of the users in our study used the social media capability of the apps where provided, and market research suggests that such features are generally unpopular.

This general antipathy to sharing also affected referrals, which have become a critical component of fintech apps' marketing strategies. CB Insights (2019) again: "The best PFM tools don't fight these anti-network effects, and instead turn referrals into a means for self-improvement. Whether your reward for bringing a friend onboard is Apple stock or a bucket of American defense ETFs, referral bonuses in the PFM space can be a powerful way to demonstrate a product's value to new users and get them hooked." Our data suggest otherwise. While several study participants recommended Mint to others—including to others in the study!—none of the Acorns or Stash users did so. We suspect that the idea that "personal finances are personal" carries over from social media functions to referrals and social networks.

A working hypothesis to explore is that users with several preexisting overlapping affinities or memberships—credit union membership, for example—might be more willing to refer to members of specific, overlapping affinity groups than other friends or relatives. One might compare credit union members with credit union nonmembers; young, college student credit union members with young, non–college student members; older credit union members with younger credit union members. Apps might also be designed to permit referrals only to members of specific groups to enhance group affinity or identity, such as allowing a user to refer the app to another credit union member.

The Time Scales of PFM Apps Do Not Match People's Future-Focused Aspirations

We asked participants in this study to talk about their short-, medium-, and long-term financial goals. Dreams for the future were sometimes relatively underspecified and generic; however, participants almost universally had significant concerns over housing in the future. Indeed, we were struck by the consistency across subjects: with very few exceptions, people cited the standard "American dream" of owning a home and starting a family. Owning a car was the other major goal. A large proportion (more than one-third of participants) mentioned retirement, too; some participants had already set up an IRA or had a 403(b) through their university employer.

> Ten years. I'll probably start looking into retirement funds and planning to buy a house and a car. [I'm] also planning to have kids, too. So more expenses. And hopefully by then, I'll have paid off my student debt. If not, then also that. (Amanda, Acorns user)

> Probably saving for a down payment on a house and maybe retirement accounts. Because a house is . . . a big goal of mine. (Giang, You Need A Budget user)

> My short-term goal is to pay off my credit cards. And then, start working, saving money, get a good decent job, and save, because the economic stability is shitty, and I know that cravings are good but kind of just stop, and yeah, that's it. I think that's what I'm going to do, save money, and then hopefully by saving money, I could get a house. (Stephanie, Mint user)

At the same time, while most of our respondents reported that among their longer-term financial goals was to own a home, this was not always expressed without ambivalence. Our respondents reside in a real estate market with rapidly declining affordability. The dream may be to own a home, but it was expressed with anxiety and no small degree of fear.

> Other financial goals, probably just not be living in a box after [graduation]. (Katherine, You Need A Budget user)

> So once I do find a job, I would like to buy a house. And it's really hard, especially in housing markets like Southern California or New York, but that's also kind of where you want to work, you know. So figuring out a way to have enough money for even the down payment is pretty challenging. (Jake, Mint user)

Our respondents also seemed more concerned about dealing with precarious and unstable incomes now and potentially throughout their lives. This has a different valence from the white-picket-fence ideal. In other words, even if some do hold it dear, owning a home may also be a way of expressing interest in financial well-being over a long time horizon. That is, "owning a home" may simply be a way of expressing a desire for long-term financial stability.

A key failure of these apps was the mismatch in time scales. The temporal horizon of the PFM apps did not match users' ambitions and aspirations. In fact, users became disillusioned with these apps because of the apps' assumptions about the time span of their financial plans.

> This money [from the Acorns Round-Up feature] just kept going into the bank account, and I made like six cents off of it. . . . I feel like maybe if I was using it for a super-long time, there would have been more growth or something. But in short-term durations, I feel like it didn't really benefit me in any way, and I was like, why did I keep checking this app? Why am I using it? (Mary, Acorns focus group)

> I want to reevaluate my budgeting methods before picking a software. Just like YouTube, researching how others have budgeted. I think it's really important to find techniques that work for your lifestyle. It doesn't make sense for me to search for how a senior should budget versus how a middle-aged person who has a family and a job and a house to manage would budget. I want to see how a student should budget, and then eventually see how someone looking to buy a house would budget. And then, try to find an in-between so I can have room to prep for that, because long-term financial planning is the key goal, personally. (Giang, You Need A Budget user)

Acorns, for example, asked a user about her plan for the next several decades; the user reported that she could not even trust that the app would still exist in 70 years. She felt it was ironic that an app would be asking a user to plan over the next several decades when she could have little confidence that the company itself would be around over the long-haul time horizon with which she and other participants were primarily concerned.

> In the app, it has a projection like in decades. "If you continue the way that you're doing right now, you could save like $70,000." And I guess that that's the way long-term investment works, but I don't quite . . . My Vanguard, like I trust that they're going to be around in that amount of time, that, you know, I'm going to like actually be able to grow that over decades. Whereas Acorns, I don't know if the technology is going to be the same, like with the app. I don't know if the company's going to be around for decades, so there's also that issue with not being able to imagine that decades-long process. (April, Acorns focus group)

Conclusion: Design Principles

PFM is a growing area of need for many people, and fintech start-ups and apps have stepped in to fill the gap between existing alternative financial services providers (e.g., payday lenders or check cashers, high-end wealth management and financial advisers) and traditional financial institutions like banks and credit unions. These apps have seen rapid growth in user acquisition and even more dramatic investment by venture capital. But how are such apps received by users? Do they work as intended? What are the effects on users' understandings of and approaches to money management?

In this study, we evaluated the use of five popular PFM apps among young people. Interviews and focus groups with users revealed a range of lessons: features and functions that proved successful and should be emulated by credit unions looking to build member engagement or a PFM business, as well as many app failures and user frustrations that indicate areas for credit unions to avoid. We summarize these implications in the following nine design principles—lessons learned that can be applied in building one's own PFM strategy and tools or in partnering with others to meet members' PFM needs.

1. Design for trust. People trust established financial institutions. That said, traditional financial institutions' mobile apps are negatively perceived. Plain and simple. Users want better-designed apps from their banks and credit unions. In the digital era, the quality of design indicates competency, which is foundational to trust. Savvy users look to the aesthetics of an interface to discern whether it is trustworthy, but also whether it is worth their time. Visually unappealing apps, particularly those on offer from traditional financial institutions, are assumed to lack the functionality users need. Common mobile design pitfalls include a cluttered and clunky interface, a design that overloads users with too much information, or one that produces unnecessary friction and low ease of use with excessive clicks, 1990s-style aesthetics, unclear navigation or broken links, and generic or poorly produced content, whether images or writing.

In short, design matters. Far from simply an added bonus or "nice to have," high-quality mobile and web design is an indicator of competency and stability. It is essential for drawing members in and earning their trust.

2. Design for financial instability and uncertainty. Irregular income, unpredictable expenses, independent work, and economic uncertainty: these are the norm for millions of Americans. The most recent *Report on the Economic Well-Being of US Households* by the Federal Reserve suggests that at least 30% of adults face monthly income volatility (Board of Governors of the Federal Reserve System 2019). According to the Pew Charitable Trusts (2015), 60% experience at least one major financial shock (an unexpected expense or unforeseen loss of income) per year.

Budgeting and investing apps need to be built with these factors in mind. The categories in budgeting apps need to better reflect the spending behavior and income flows of people who lead unstable financial lives, or allow for customizability. In this case, simplicity may be the way to go: people prefer the blank slate of Excel over the more intensive hands-on tailoring required by some budgeting apps.

3. Design tools that are adaptive, not prescriptive. Users chafed when the apps made inaccurate assumptions about their income and spending, and they did not feel compelled to correct, customize, or train the app if the process was not an intuitive one. Yet the mismatches were many. Frustrations ran particularly high when these mistaken assumptions led to inaccuracies in how their finances were represented ("That's not my net worth!"), undermining the appeal of using apps at all. There are infinite possibilities for formatting, personalization, and change when someone puts a pen to paper to plot out their finances. Personal finance apps should center on tools that are open and simple, giving users the autonomy to quickly customize and design for themselves accounting processes that fit their needs.

4. Make room for people's existing financial practices. Users already maintained a plethora of systems for managing their money; the range of technologies and relationships through which they dealt with their money included payment services like Venmo, cash, Excel and Google spreadsheets, paper notebooks to keep track of expenses, bank and credit card statements, and more. The history of money shows us that new technologies never replace old ones wholesale. Instead, new technologies are additive, layering on top of (and existing alongside of) current systems and practices. Apps' functions should be designed to complement, augment, and interface with users' existing practices. This could be as simple as allowing for users to easily export the data that have been aggregated and structured by apps.

5. Make room for cash. We were really struck by the extent to which cash mattered for users' management of their finances, whether as a control mechanism to limit their spending or as a way of tangibly representing their finances. While cash use may be diminishing at the point of sale, cash is still in demand as a means of payment for many people, and cash is definitely used as a store of value for those for whom Venmo or debit cards make spending down their bank accounts too easy. Cash persists. Developers need to be aware of this and design for people's use of cash alongside other technologies rather than fighting it.

6. Align time horizons. Users were skeptical about whether these apps would be around for the long haul, undermining their willingness to fully adopt and incorporate them into their accounting and investment practices. Apps must be designed to account for the way that users' personal sense of time impacts how they relate emotionally to their money, and therefore apps themselves. For investment apps, for example, this may mean mitigating the way that users perceive short-term gains or losses, and the day-to-day rhythms of the market.

7. Beware of mixed messages. Users were put off by in-app or app-initiated emails with targeted advertising and cross-promotional benefits. In a context where users are skeptical about trusting institutions with financial information and personal data, targeted ads and promotions seem to betray the interest of app providers in promoting financial health and well-being. Indeed, from the perspective of users, these undermined perceptions of an app's legitimacy as a trusted provider of financial information and services. For credit unions, while taking advantage of the opportunity to offer tailored services may seem appealing, it is important to be cautious about the way that this is done. Avoid advertising and promotions, and targeted rewards and recommendations should be used sparingly, if at all.

8. Ditch social—or make it authentic. Users were less keen on social media connections, as well as the ability to share or refer friends to receive bonuses, than app developers seem to think. That said, there might be a way to devise referral services that promote affinity or engagement—not between individual users themselves, perhaps, but between users and their financial institution. Think: a tool that lets a credit union member share their experience with an app with another credit union member, or an internal Yelp-type reviews system.

9. Treat apps as gateways or stepping-stones, not end points. The use of these fintech apps raised awareness about personal finance among participants; most expressed a desire to learn more, including a desire for real education from trusted sources in digestible bits, and they often ended up searching out that education on their own. Many went to YouTube, but some took the initiative to visit their bank or credit union—even for the first time! If apps serve as gateways to in-person or direct-to-financial institution quests for trusted advice, find a way to open that gateway wider. Direct users to visit their branch as appropriate, or to engage via chat message or a phone call to receive financial advice.

When it comes to the pre-prepared financial education modules, think short videos, not long text articles. Layer moments for education into the functionality of the app itself (e.g., options to tap to learn more while completing basic functions) rather than hosting educational material elsewhere in the app (no one will look at this).

At the end of the day, despite their always-online, mobile lifestyles and their desire for 24/7 seamless access to information about their money, our research subjects' go-to for trusted financial management and advice is their bank or credit union, even if they are not currently availing themselves of such services. They expect banks and credit unions to be around for the long haul. And they are planning for the long haul, too. This alignment of time horizons matters. It can be leveraged by traditional financial institutions to their advantage and to serve their clients and members.

APPENDIX 1

Interview and Focus Group Questions

Preliminary Interview Questions

A. *For existing users of fintech apps*

1. How long have you been using [app]?
2. Why did you start using it?
3. Did you pick it from among several or is this the only one you've ever used?
4. How did you find out about it?
5. How often do you use it? Every day, once a week, once a month?
6. [For Stash or Acorns users only] Do you invest? How (method)? How did you learn?
7. Tell me how it's changed your financial decisions? (if at all)
8. How does using the app make you feel? As in what emotion(s) do you generally feel related to the app (when using, if you don't use it for a while, etc.). Have you experienced other emotions related to the app that you don't feel anymore? How come?
9. Will you let me watch you use it?
10. Has using the app taught you anything about yourself? About your spending? About your other financial decisions? About how you feel about money management?
11. Do you have any financial goals? What are your financial goals? (short and long term)

B. *For nonusers of fintech apps*

1. Do you have a bank account? Credit card? Debit card? Checkbook?
2. Do you use any apps like Venmo, PayPal, etc., on your phone or online? What do you use them for?
3. Have you ever tried an app like [Mint, You Need A Budget, etc.]? Why or why not?
4. Does your inexperience with such apps have anything to do with how you feel or think you might feel using the app?
5. Do you use apps for matters not related to your finances? How do you keep track of your finances?
6. Do you have a spreadsheet or a checkbook or some other digital or physical method for keeping track of your finances? Can we see it?
7. [For Stash or Acorns users only] Do you invest? How (method)? How did you learn?
8. Do you have any financial goals? What are your financial goals? (short and long term)
9. Would you be willing to try [app] for a month and then tell us about your experience?

Focus Group Interview Questions

1. If your friends asked you what [app] is, how would you describe it to them? What is the purpose of the app?
2. [For new users] What was it like to set up the app? Describe the process to me. Did you have to link any of your other accounts? Any privacy concerns? Was there anything difficult about setting up the app or starting to use it?
3. You all have been using the app for about two weeks now. How has your experience been so far? What benefits (if any) do you see it providing you? What problems (if any) does it pose for you? Did you notice any changes in your behavior or thinking?
4. Discuss as a group your prior financial education. Have you ever had anyone teach you about managing your money (and/or investing)?
5. Have you learned anything about financial management from using the app?
6. Does the app use any vocabulary or concepts that are new to you? Does the app offer tools to help you understand these terms and concepts? Have you done any research beyond the app to understand them?
7. Some people shared other systems they have for managing their finances in their preliminary interviews. Is anyone still using their old system alongside the app? How is that working?

8. People acknowledge a range of feelings when it comes to thinking about and managing their money. What would you say are the most typical emotions that you feel related to managing your money? Are there any emotions you may have felt occasionally but not regularly?
9. Have you talked to friends or family about using the app? What have those conversations been like?
10. Do you think you are likely to keep using the app after our study is over? Why or why not?

Exit Interview Questions

1. How often did you use the app? How much time did you spend in the app when you used it?
2. How do you feel about the app after using it for a month?
3. What did you enjoy about the app (colors, visuals, interface, teaching)? [request to see participant using the app]
4. What did you find confusing or clunky? [speak to confusion with app use/interface and/or financial concepts] Did you find ways of working around that confusion? [request to see participant using the app]
5. Have you changed any financial habits? Did you think about the app as you were making financial decisions (like purchases)? What in particular came to mind, if anything? Has using the app changed the way you interact with your phone at all?
6. What is the biggest financial challenge you anticipate having over the next year, if anything? In the first five years after you graduate (for students)? Over the next ten years? What do you feel hopeful about in your financial life, if anything?
7. Did the focus group discussion affect the way you thought about the app? [focus group only]
8. Would you feel any differently about the app if it was created and managed by your banking institution?
9. Would you feel more or less motivated to use an app if it was integrated with other platforms you use (e.g., Amazon, Facebook, Venmo, etc.)? Why?
10. Do you think you will continue to use the app now? If not, are you considering using other apps or implementing any new practices?

References

Board of Governors of the Federal Reserve System. 2019. “Report on the Economic Well-Being of U.S. Households in 2018.” Washington, DC: Division of Consumer and Community Affairs, Federal Reserve Board. www.federalreserve.gov/publications/files/2018-report-economic-well-being-us-households-201905.pdf.

CB Insights. 2019. “We Analyzed 8 of the Fastest-Growing Personal Finance Apps of All Time to Figure Out the Secrets to Their Success—Here’s What We Learned.” Research Brief. www.cbinsights.com/research/personal-finance-apps-strategies/.

Fogg, BJ, Cathy Soohoo, David R. Danielson, Leslie Marable, Julianne Stanford, and Ellen Tauber. 2003. “How Do Users Evaluate the Credibility of Web Sites? A Study with over 2,500 Participants.” In: San Francisco, CA. dl.acm.org/citation.cfm?id=997097.

Harley, Aurora. 2016. “Trustworthiness in Web Design: 4 Credibility Factors.” Nielsen Norman Group. www.nngroup.com/articles/trustworthy-design/.

“How Do Families Cope with Financial Shocks? The Role of Emergency Savings in Family Financial Security.” 2015. Brief. The Pew Charitable Trusts. www.pewtrusts.org/~/media/assets/2015/10/emergency-savings-report-1_artfinal.pdf.

Kumar, Raynil, and Shaun O’Brien. 2019. “2019 Findings from the Diary of Consumer Payment Choice.” Cash Product Office, Federal Reserve System. www.frbsf.org/cash/files/2019-Findings-from-the-Diary-of-Consumer-Payment-Choice-June2019.pdf.

List of Figures

About the Authors

Bill Maurer, PhD

Dean of the School of Social Sciences and Professor of Anthropology; Criminology, Law and Society; and Law, University of California, Irvine

Bill Maurer is the author of numerous books and articles, including the edited collection (with Lana Swartz) *Paid: Tales of Dongles, Checks, and Other Money Stuff* (MIT Press), and most recently, the editor of the six-volume series *A Cultural History of Money* (Bloomsbury), covering antiquity to the present day. He directs the Institute for Money, Technology and Financial Inclusion and the Filene Center of Excellence for Emerging Technology. Bill is a fellow of the American Association for the Advancement of Science and a fellow of the Filene Research Institute, and he serves on the Board of Behavioral, Cognitive, and Sensory Science at the National Academies of Science, Engineering and Medicine. He received his PhD and MA from Stanford University and his BA from Vassar College.

Melissa K. Wrapp

PhD Candidate in Anthropology, University of California, Irvine

Melissa Wrapp's research explores the relationship between inequality and urban planning, specifically in reference to housing design. Her dissertation investigates the impact of sustainable urban planning principles on property, activist practice, and lived experiences of the city in South Africa. Melissa extends her commitment to financial justice through research into the sociolegal implications of emerging financial technology with the Filene Research Institute's Center of Excellence for Emerging Technology. She has an MPhil in social anthropology from the University of Cambridge and a BA in anthropology from the University of Notre Dame.

Chandra L. Middleton

PhD Candidate in Anthropology,
University of California, Irvine

Chandra Middleton returned to graduate school after a decade as an attorney in Washington, DC, where she worked with the National Center for Victims of Crime and the Environmental Law Institute. She uses her legal expertise to study participatory environmental governance in the United States, focusing on how government employees use administrative and environmental law to engage the public. Chandra furthers her interest in regulatory processes as a graduate student researcher with the Institute for Money, Technology and Financial Inclusion and the Filene Research Institute's Center of Excellence for Emerging Technology; in this capacity, she studies financial and regulatory technology. She has an MA in cultural anthropology from the University of California, Irvine, a JD and a Certificate in Environmental and Natural Resources Law from Lewis & Clark Law School, and an AB in anthropology from Washington University in Saint Louis. Chandra is a member of the DC Bar, the American Anthropological Association, and the Law and Society Association.

Vivian Dzokoto, PhD

Associate Professor,
Virginia Commonwealth University

A psychologist by training, Vivian Dzokoto focuses on identifying cultural dimensions that affect money behaviors, emotions, and mental health primarily in African settings. Her research on money focuses on identifying and understanding barriers to and drivers of money behaviors such as savings, adoption of money technologies, and use of new forms of currency. Vivian has been a multiyear research fellow of the Institute for Money, Technology and Financial Inclusion.

Jenny Fan

Institute Manager of the Institute for Money, Technology and Financial Inclusion (IMTFI)

Jenny Fan coordinates the dissemination of research at the Institute for Money, Technology and Financial Inclusion (IMTFI) and fosters collaborations and connections with and on behalf of IMTFI fellows in a variety of academic, policy, and other professional communities. Jenny received her MFA in creative writing at the University of Washington and her BA at Wellesley College, and is the recipient of the Charles Johnson Award in Fiction. IMTFI looks at the consumer side of financial technology—everything from mobile money to artificial intelligence–driven alternative credit scoring. IMTFI focuses on the everyday use and implications of these new technologies: how people engage with, refuse, modify, hack, and share them, and how they in turn influence people's understandings of money, value, justice, and even faith. Learn more at imtfi.uci.edu.

About Filene

Filene Research Institute is an independent, consumer finance think-and-do tank. We are dedicated to scientific and thoughtful analysis about issues affecting the future of credit unions, retail banking, and cooperative finance.

Deeply embedded in the credit union tradition is an ongoing search for better ways to understand and serve credit union members. Open inquiry, the free flow of ideas, and debate are essential parts of the true democratic process. Since 1989, through Filene, leading scholars and thinkers have analyzed managerial problems, public policy questions, and consumer needs for the benefit of the credit union system. We support research, innovation, and impact that enhance the well-being of consumers and assist credit unions and other financial cooperatives in adapting to rapidly changing economic, legal, and social environments.

We are governed by an administrative board comprised of influential executives. Our research priorities are determined by a national Research Council comprised of leaders and credit union CEOs.

We live by the famous words of our namesake, credit union and retail pioneer Edward A. Filene: "Progress is the constant replacing of the best there is with something still better." Together, Filene and our thousands of supporters seek progress for credit unions by challenging the status quo, thinking differently, looking outside, asking and answering tough questions, and collaborating with like-minded organizations.

Filene is a 501(c)(3) not-for-profit organization. Nearly 2,000 members make our research, innovation, and impact programs possible. Learn more at filene.org.

"Progress is the constant replacing of the best there is with something still better."

—Edward A. Filene

Filene

1010 E. Washington Ave.
Suite 306
Madison, WI 53703

608.661.3740
info@filene.org

Publication #487 (11/19)