

In the Balance: Insights from Collaborative Financial Technologies

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Abstract

Financial technologies have reshaped how many individuals manage daily financial activities, introducing new ways to interact with traditional financial products. Given the swift adoption of these technologies, shared language and conceptual frameworks are needed to better represent emerging methods of financial collaboration, hopefully leading to informed design and research. We provide the first in-depth analysis of 31 consumer-facing financial applications that provide support for budgeting, payments, and long-term planning to identify how sharing is mechanized at the system level. Our analysis offers sharing dimensions and patterns that depict the diversity of how existing applications support, or actively hinder, participation in financial sharing. Reflecting on our analysis, we highlight the need for more granular information for consumers and advocates to promote healthy financial sharing practices.

CCS Concepts

• Human-centered computing → Empirical studies in HCI.

Keywords

financial account sharing; intimate partnerships; money work

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1 Introduction

Given the rising cost of living [46], sharing finances within close relationships—such as between spouses, family members, and close friends—has become a necessity. As financial pressures mount, the adoption of financial technology has also surged globally [30, 36, 82, 83], with consumers increasingly depending on such tools to manage a wide range of daily financial activities, including online banking and payments [36, 52, 75, 82, 83]. While various methods exist for coordinating and sharing finances, financial technologies are touted to provide a streamlined way to pool resources toward common goals [85], facilitate collaborative financial management [58], and offer targeted assistance for economic challenges [8]. Open Banking standards and application programming interfaces (APIs)

[82] also enable such changes, simplifying managing money by aggregating data from multiple financial accounts.

Given these new directions in technology and finance, researchers in the field of Human-Computer Interaction (HCI) have analyzed various subdomains of digital financial interaction [31]: from analyzing the recipes of new programmable money [32], to explicating the metaphors used in investing platforms [20, 27]. Despite the large impact that design can have on financial behaviors, research on the technical makeup of *how* personal financial management applications share information between users is scarce. This stands in contrast to the detailed investigations into the access controls embedded in complex sociotechnical systems on social media [42], online encyclopedias [51], and remote working [79]. Questions about how information is protected, how permissions are managed, or how data is partitioned across user types (e.g., account holders, onlookers) remain largely unexplored.

As a wealth of prior work has demonstrated, inadequately designed sharing mechanisms can lead to negative consequences for financial well-being by unintentionally enabling financial surveillance or control [11, 41], such as account hijacking [73], which can exacerbate issues of trust and autonomy in shared finances. Furthermore, financial systems often fail to clearly convey the visibility of financial information to users, leaving them unaware of the inferences onlookers might draw about personal details such as their location, financial status, and more [2, 14, 17]. Intimate partners and other close relations often turn to account sharing [58, 59, 78, 89], where accounts and devices were typically designed with a single user in mind [3], increasing the risks of security vulnerabilities.

Recognizing how sharing is currently implemented in digital technologies advertised for collaborative accounting allows for the identification of potential risks or vulnerabilities, including privacy concerns [17], financial control [11, 12], or unequal power dynamics within relationships [73]. Given that financial technologies have been consistently found to influence individual and household financial behaviors [10, 15, 18, 28, 44, 54, 56, 61], there is a need to examine the mechanisms underpinning current financial systems.

In this paper, we contribute to the growing domain of digital financial interactions and ‘new monies’ [31] by addressing the calls to better codify the baseline system designs that underpin existing financial collaborative technologies [63, 73] — a task as of yet unaccomplished despite their prevalence. To do so, we focus on defining the functionality of the most popular personal financial management applications marketed to users in close social relationships — the most common way many smartphone users manage their finances collaboratively with others [83].

First, we address this goal by analyzing 55 financial applications to understand how they are advertised to users seeking to share



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financial resources or information. Second, we complement this analysis through an audit of 31 services to codify and contrast how such sharing relationships are modeled.

Our findings reveal four key dimensions to characterize financial sharing: how the sharing relationship is established (*origin*), who is involved (*relationship*), what capacity they have to control the flow of financial information (*authority*), and when this sharing occurs (*dynamic*). Codifying these dimensions helped us identify clusters of four prevalent sharing patterns: applications where users are encouraged to take on the role of a collaborator (equivocal privileges), a coordinator (unequal privileges at the high level, but equivocal privileges at the low level), a creator (privileges strictly tied to authorship) or a broadcaster (active creation and passive consumption of financial information). These labels provide a focused, financial-specific vocabulary, unlike broader discussions of access control [79] or ethnographic descriptions of complex systems [45, 99], providing the building blocks for future technologies.

In summary, our contributions to the field of HCI are threefold: (a) we offer four dimensions of sharing — origin, relationship, authority, and dynamic — which provide a concise repertoire of the social, emotional, and practical factors specific to financial sharing; (b) we describe and analyze instances of financial sharing patterns, grounding and clarifying these manifestations in existing financial management technology products used by millions of users; and, (c) we propose concrete design considerations to adapt current financial technologies, safeguarding against financial control, unwanted surveillance, and secure financial accounts to encourage flexible interactions with digital finances.

2 Background and Related Work

Our work focuses on *close social relationships*, such as friendships, romantic partnerships, and family ties, which often require financial collaboration [55, 80]. Such relations are best characterized by higher levels of trust, commitment, knowledge, and emotional (and financial) intimacy than between strangers. Understanding how close social relationships handle financial sharing at a low level has societal implications; offering insights into how financial behaviors within relationships contribute to patterns of wealth distribution [77], financial dependency [4], or economic empowerment [11].

There is a breadth of financial activities that can take place among close individuals, such as savings [40], purchases [31, 86], and investments [27]. We opt to focus on *collaborative personal finances* — the process of planning and managing personal financial activities such as income generation, spending, saving, investing, and protection.

Characterizing financial sharing relationships. Systems of financial arrangements between individuals are highly complex [24, 110]; often resisting being fitted into neat categories or boxes [77] and are subjected to socio-economic and cultural factors [109]. Despite such challenges, HCI scholars have grappled with the tasks of representing financial sharing and devising tools in doing so. Obada-Obieh's terminology of *not designed for sharing* (NDS) and *designed for sharing* (DS) helps characterize the design of specific user accounts at a high level [73]. While such language can be used to characterize some financial accounts (e.g., joint or personal

accounts), understanding digital financial management requires more nuances than examining practices at the account level alone. Particular users have different levels of comfort and expectation depending on the recipient [8], the context that their financial data may be shared [80], and how granular the data type of information is when sharing [14]. Thus, we must examine the lower-level mechanisms related to system-level privileges and authorities [93], as they form the foundations for various forms of device or account usages [78], whether it involves mutual use, setting up a device on behalf of another, or assisting others with shared tasks [63].

Given the nuanced, socially-situated nature of personal financial management systems, existing financial mechanisms are (perhaps unsurprisingly) found to be inadequate in supporting peoples' needs [8, 69, 107, 108]. Many studies in the existing literature emphasize the need for equitable technology-mediated collaborations, ensuring that all participants are clear about what is shared and with whom [14, 41, 44, 67]. However, such aspirations are difficult to achieve if developers and designers are unequipped with characterizations of what is shared and how. After all, new forms of financial technology are only "*as useful as how they are understood and how they support users interact with them*" [81]. While everyday socio-economic interaction between users around payment [27, 81], banking [21, 27, 106], and the tracking of personal [50, 54, 55], household [77, 91, 92, 108, 110] and occupational [31–33, 100] finances have each been investigated, a more granular perspective on these interactions remains largely unexplored.

Capturing such a granular view of finances can be a complex challenge. While scrutiny of access controls and models (i.e., permissions, roles, and hierarchies [79]) can elicit fine-grained insights, such models can fall short in understanding how such concepts intersect with relational dynamics between individuals. Conversely, analyses of shared processing of information across individuals and tools (i.e., via distributed cognition [45]) or the shared contextual nature of decision-making [99] can represent dynamic systems in use. However, this approach can overlook how to systematically categorize how multiple systems with similar (but not identical) features in how to mediate human actions [45, 74, 99]. Thus, in this work, we approach the task by being informed of both access control systems (users, groups, and objects) and the dynamic, contextual factors that may emerge from complex system analyses.

Finances in close relationships. Sharing finances in close relationships is a common expression of trust and mutuality. Prior studies identify that relationship interdependence from pooling finances and having shared financial goals correlate with higher relationship satisfaction [6, 18, 37] and reduced financial stress [84]. Sharing financial information can strengthen bonds by making goals explicit [85], support delegation of responsibility for financial challenges [84], and improve financial task completion [78].

While transparency and openness around spending are generally promoted in a close interpersonal relationship, many exceptions exist. Unauthorized access to financial information can provide malicious adversaries with a high degree of social and logical control over those who might share it [14]. For instance, in the case of financial abuse [11, 12], survivors may be coerced to share such information with a partner. Likewise, for users with low socio-economic status, there is a greater expectation to provide fine-grained data

in the form of receipts in exchange for benefits as evidence of the maintenance of appropriate spending habits [66]. In their work exploring account sharing, Park et al. [78] identify many reasons why users may not wish to share everything with an intimate other, such as shame from overspending or a right to a private life [38].

A lack of supportive infrastructure to identify when sharing goes wrong can enable harmful breaches of privacy and security in intimate settings, such as account closures when abuse is suspected [53], or being underserved by services initially marketed as secure [11]. While work has examined *why* close relationships share [78], *how* this is influenced across time [58], and the authentication strategies they use to do so [89], characterization of the low-level sharing mechanisms via financial applications is still relatively limited. Restricting our terminology to whether a system is designed for sharing, or not [73], makes it difficult to determine which small design changes would constitute an improvement to sharing financial resources, particularly for at-risk users. Our study, therefore, focuses on evaluating the current state of personal financial management technologies by analyzing how they facilitate financial sharing, with particular attention to the tools, mechanisms, and their relationship to collaborative financial practices.

3 Methodology

In this work, we focus on characterizing financial sharing mechanisms in prevalent personal finance applications that enable financial sharing. Here, we describe the design of our user journey audit (Section 3.1), our search strategy used to identify relevant financial applications (Section 3.2), and our data collected via these journeys and use of an automated scraper (Section 3.3). We also cover our approach to analyzing the data, namely through the use of qualitative coding, influenced by inductive and reflexive thematic analysis (Section 3.4), and conclude with a reflection on the ethical dimensions (Section 3.5) and limitations of this work (Section 3.6).

3.1 User journey audit design

To gain a low-level understanding of financial management tools, we sought approaches that allow us to closely examine the software user interface as users experienced it. While automated data mining approaches [68, 113] or crowd workers [49] are common techniques in HCI work, both proved to be unsuitable for this study as they rely on a priori knowledge of the systems under examination. As much of the software under study pertained to financial information, additional authentication devices (phone number, authenticator) were necessary and would stall automated tools. Secondly, outsourcing the investigation of user interfaces to often poorly paid end users is neither ethical nor viable in this context. Each tester would be required to use synthetic accounts instead of their personal information, which could make it challenging to enforce consistency.

Therefore, we designed a user journey protocol to model how two users may share financial information. As a research method, a journey involves a member of the research team tracking each step a user takes, from the initial interaction to the completion of a specific task or goal, capturing key moments, and decisions. We drew on prior literature on how to structure a user journey [12], organizing our journey into five steps: orientation, initiation, instrument creation, privilege examination, and deletion (Figure 1).

Audit protocol. Before starting the audit, we created synthetic information for two fictional users Tina and Eli who are in an intimate partnership and seek to share financial accounts with each other. While the synthetic personas simulate an intimate partnership, the protocol is not restricted to this relation type alone. The low-level mechanisms we examine apply to other dyadic relationships where individuals can competently use separate devices to represent their identities, such as family members, flatmates, friends, and more. This setup may not perfectly represent individuals who require set-up on one's behalf (e.g., parents for children, adult children for older adults), yet we see scope for adapting this protocol for future use in these contexts.

In the first step of *Orientation*, we navigated to the application's listing and examined where sharing was mentioned. Then we downloaded the latest version of the software to research devices. Next, at *Initiation*, the application is launched on both the first user device (Tina) and the second user device (Eli). Tina is the designated sharer — one who first registers for an account, while Eli is the designated receiver — one who receives an invitation to participate. For *Instrument Creation* the researcher then creates a financial instrument and triggers to share the instrument with the second user (Eli). Each researcher examined the available options for sharing financial information within the application. Eli, the *receiver* may or may not require signing up for an account to accept this request. For *Privilege Examination*, each researcher then documents all affordances, such as buttons or dropdown menus, that indicate the possibility of modifying the sharing settings (e.g., designating other users as administrators, classifying certain data as private). Finally, for *Deletion*, each user tries terminating the sharing relationship, either by a user leaving or by deleting the sharing arrangement.

3.2 Search strategy and dataset

To form a dataset for our study, we employed two search strategies: a keyword search via search engines and app stores, and a sample from lists of popular applications on app stores. We combined three search areas to mitigate the risk of small sample size but to retain our focus on smartphone software. We focused on two leading app stores: Apple's *App Store* and Google's *Play Store*. As of September 2024, the App Store lists 65.8K Finance apps (3.2% of the total), while the Play Store lists 83.6K (3.8%). Together, they hold 58.81% and 40.81% U.S. market share, respectively. Each app store categorizes software into main categories (e.g., Health and Fitness) and subcategories (e.g., Games, Magazines). Despite slight differences in the number of subcategories (53 on Play Store, 69 on App Store), prior works [82, 83, 103] show that both stores list identical collections of applications pertaining to payments, investing, personal finance, credit, lending, banking, insurance, and financial news under Finance.

Our focus on the U.S. region of both stores arose from logistical constraints: the researchers' location and app store licenses limited access to U.S.-specific content. Many apps also require users to be U.S. residents, and regional app stores pose language barriers, further limiting our potential to analyze these applications.

To identify relevant apps, we conducted keyword searches using search engines (Google, Bing, DuckDuckGo) with terms associated

Orientation	
1	Navigate to: Apple's App Store or Google's Play Store
2	Download the latest version of the application on <i>USER_1</i> device, on latest iOS/Android version
3	Download the latest version of the application on <i>USER_2</i> device, on latest iOS/Android version
4	Launch both applications on <i>USER_1</i> and <i>USER_2</i>
↔	If buggy then exclude application from review with notation: application does not launch
5	On the app's landing page or website, identify places that mention or describe how the sharing functionality of the applications work. This may either be in the: landing page, help articles, or frequently asked questions (FAQs).
6	Take a screenshot of the section(s) where sharing is mentioned.
7	On <i>Analysis_Matrix</i> , note the sharing capability as either: (i) supports sharing; (ii) lacks sharing features but can support implicit sharing (e.g., linking other accounts); or (iii) does not have features that support sharing.
↔	If (iii) then exclude with a note that the application is not initialized with sharing functionality
8	If the capability falls under (ii) or (iii), note if the app encourages credential sharing for a single account and include a link to where the verbiage is used on <i>Analysis_Matrix</i>
Initiation	
9	Launch downloaded application on the <i>USER_1</i> device
10	Navigate to user registration/onboarding process
11	Record if the sign-up/on-boarding requires <i>USER_2</i> being signed up
12	Record if sign-up requires two-factor authentication or additional verification. Note down what requirements are needed to join.
⊖	Repeat Steps 9–12 for <i>USER_2</i> .
Instrument Creation	
13	Turn on screen recording for <i>USER_1</i> device
14	Navigate to the reported <i>Shared_Instrument</i>
15	Initialize <i>Shared_Instrument</i> with plain text title/description
16	Navigate to feature to share <i>Shared_Instrument</i> and select to share <i>Shared_Instrument</i> with <i>USER_2</i>
17	Record how <i>Shared_Instrument</i> can be shared (e.g., link, email, QR code)
↔	If sharing cannot be initiated or received by <i>USER_2</i> exclude with a note that feature does not perform sharing as described
18	Accept notification from <i>USER_1</i> for <i>Shared_Instrument</i> and follow on-screen walk-through
↔	If buggy exclude with a note that invitation does not allow <i>USER_2</i> to join
Privilege Examination	
19	Navigate to the Settings of the <i>Shared_Instrument</i> and note down the options (e.g., modify privileges, add/remove user, delete/leave group)
20	Examine Settings from <i>USER_1</i> and <i>USER_2</i>
21	Record on <i>Analysis_Matrix</i> the options available and the dependencies for the sharing relationship
⊖	Repeat steps 19–21 for <i>USER_2</i>

Figure 1: Detailed auditing protocol for investigating sharing relationships on budgeting applications. ↔ means exit protocol for exclude criterion. ⊖ means repeat a set of steps, *USER_1* and *USER_2* are fictional users with dummy data while *Analysis_Matrix* is a placeholder for any shared data storage system for auditors.

with close social relationships (e.g., “*couple sharing money*,” “*financial app for couples*,” “*financial app for teens*,” “*household management app*”). We recorded the top 10 results from social media posts (such as Reddit) and listicles of curated applications recommended by users, journalists, and paid marketers for financial collaboration in close social relationships, for a list of 78 apps.

We then conducted identical searches on the App Store and Play Store, yielding 89 additional apps. Lastly, we examined two popular collections (allegorically calculated ordered lists) of the 200 most downloaded free apps on both platforms to capture any missed popular apps, adding 17 more to our set.

Include and exclude filtering. After manual inspection, we compiled a list of 184 applications between January — February 2023 and July — August 2024. Given the small size of our sample, we manually reviewed the content of each application and recorded its details in a shared spreadsheet. This included the application name,

website, sharing functionality, how the application was discovered, download numbers, and number of App Store reviews.

We excluded applications that did not satisfy one of the following criteria: (i) were available for download or usage in the US, (ii) were applications for financial purposes (broadly construed), (iii) functioned as advertised and were free of bugs, (iv) were advertised as for financial sharing in a social setting. In this context (iv) financial sharing refers to a user's capability to interact with one or more individuals through shared entities or data that both parties can access, view, and modify interactively. We identified the capability of financial sharing by scanning for keywords such as ‘share’, ‘collaborate’ or ‘invite’ in the application description, as well as by recognizing concepts that inherently suggest sharing, such as ‘groups’, ‘teams’, and ‘spaces’. After filtering, we were left with 55 applications for further analysis and user journey audit (see Appendix, Figure 4). All 55 were iOS or Android OS applications, aside from three web-only applications. Although these web-only

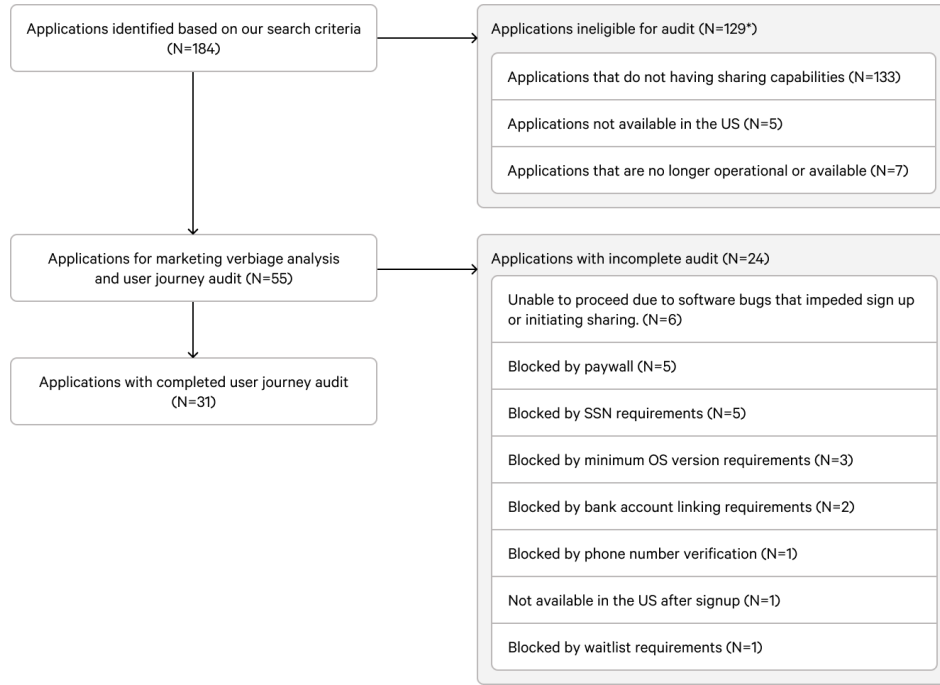


Figure 2: PRISMA-like flowchart [76] depicting the two-stage inclusion/exclusion process for applications from our software review. 184 applications were identified via our search criteria, whereby applications were then excluded based on functionality (133), location (5), and software availability (7). Of the 55 remaining applications a further 31 apps were excluded on version or software misimplementations (9), paywalls (5), provision of PII (5), and access to third-party resources.

applications were outside of our original scope, we opted to include them as they met all four of our criteria.

3.3 Recording User Journeys

To compare sharing mechanisms, we required concrete comparison factors that characterize these processes beyond automated banking components [32] or descriptions of specific functionalities (e.g., social awareness streams [2]). Unfortunately, such a list of factors does not exist for sharing financial instruments [82], and there is no common guideline or best practice on how to implement these sharing mechanisms via user flow on such applications [7, 11, 32]. Therefore creating a comprehensive list of important factors to sharing is an important component of this work.

To conduct the audit on mobile applications, two researchers (both co-authors) first downloaded up-to-date versions of the applications onto their personal and lab devices. One researcher was assigned to do iOS user journeys on an iPhone 6s Plus (iOS v.15.7, v15.8.3) and iPhone 12 Mini (iOS v.16.6, v17.5.1), while the other was assigned to do Android user journeys using Google Pixel 4 and Google Pixel 5a, both running Android (v.13.3). In the context where we ran into version challenges, we tested the application on an iPhone 13 Pro (iOS v.18.0 Beta). Each device was designated to each persona, and a brand new Gmail account was registered under their name. The setup for auditing web applications followed a similar approach. Instead of mobile devices, we initiated a separate Google Chrome browser incognito session for each persona, with

each session logged into their designated Gmail account. The researchers documented all user interface interactions through screen recordings and systematically recorded details about the sharing mechanisms in a structured matrix.

We encountered a small number of applications that had significant bugs or OS requirements that prevented signup (9), had locked the sharing features behind a paywall (5), or required additional conditions such as the linking of a bank account, waitlist, phone verification, or region-based restrictions after signup (5). We excluded five applications requiring Social Security number (SSN) to avoid negatively impacting the auditors' financial records.

Ultimately, we completed the user journey audits for 31 out of the 55 applications. A diagram detailing the number of applications excluded at each step can be found at Figure 2. The audit was performed in two phases, first from March–April 2023 and, second from July – August 2024. Since publication, *Bill Magic* [62], *Cloud-Spouse* [23], and *Honeydue* [43] are now unavailable, *Wally* [111] had removed their sharing features, and *Monarch* [71] had released enhanced sharing capabilities for groups of account holders.

3.4 Marketing verbiage analysis

For each of the 55 applications, we identify verbiage on the app store listings, websites, or online 'Frequently Asked Questions' (FAQs) that explain how sharing may be initiated. To further analyze *how* sharing mechanisms of 55 applications are being marketed to end users, we examined these applications' textual descriptions and value propositions to potential users.

Descriptions were collected in the *Orientation* stage of the user journey walkthrough (Figure 1) through the use of Github user facundoolano's web scrapers app-store-scraper¹ (v.0.18.0) and google-play-scraper² (v.6.2.3). All applications contained 26.1K words to analyze (M: 475 words, SD: 16 words). As each store entry contained screenshots, these were also captured and downloaded separately before being mined for further textual content.

Using reflexive thematic analysis [13], we manually reviewed the collected data and identified 24 initial codes, such as *enforcing accountability*, *generating wealth*, *imagining futures*. Latent codes were then grouped as narrative themes after further iterative and collaborative coding (Section 4). We then adapted open coding and axial coding techniques to identify comparison factors in our recorded user journeys. Two researchers individually segmented the observed journeys into meaningful stages, assigned codes for significant functionality, and noted specific idiosyncratic elements about the service (e.g., *encouraged password sharing*, *permit group sharing*, *one-time code invitation*). These codes were then combined into categories through axial coding, creating comparison factors for all applications.

3.5 Ethical Approach

Platforms are not people, so institutional review board (IRB) approval was not sought. Nevertheless, we considered safeguarding researcher privacy and maintaining application functionality. All user journey audits were conducted on dedicated research devices, web browsers, and accounts, which were deleted after the audit to prevent permanent financial repercussions to the researcher, such as opening a new credit account [12]. Our strictly observational interactions adhered to applications' terms of use, mirroring typical user behavior and avoiding any actions that could disrupt system functionality or impact other users. Finally, while privacy and security were not the primary focus, we identified malfunctioning applications and potential privacy risks, responsibly notifying developers via the reporting mechanisms provided by the App Store and Google Play.

3.6 Limitations

The US-region application store is far from representative of all financial applications across all regions [57]. In addition, our sample prioritized applications in English-language as the terminologies used for sharing may differ substantially in other languages.

Our audit interacted with the user interface using synthetic accounts on lab devices and web browsers. As we could not reverse-engineer these applications while remaining in good standing with terms of service, some functionalities may present slightly differently depending on different models, versions, or operating systems.

We were unable to audit five applications that require users to open a bank account, as this involves providing a Social Security number (SSN). While this limits our insights into integrated banking with in-app sharing, we successfully evaluated other applications that link to bank accounts (e.g., Lunch Money [72], YNAB [115]) or offer account creation services (e.g., Honeydue [43]), which

provided insights into mechanisms enabling sharing both at the funding instrument level and within the app.

Finally, as with the measurement of any digital technology, many of the audited applications release frequent software updates and the sharing mechanisms may have changed since our audit. Nevertheless, our discoveries help to map the current landscape of financial sharing in close social relationships.

4 Textual descriptions of sharing

This section introduces the first set of findings in our analysis, illustrated via excerpts from the application descriptions and contextualized within existing research. Like many prior concerns in HCI about mobile money applications [8, 32, 106], we saw a flattening and an over-simplification of financial interactions, whereby applications were predominantly advertised to “streamline financial management” (*Monarch*, [71]), ensuring that users no longer had to “fiddle about with change” (*Splid*, [95]) for digital technologies to manage — as Luna puts it, “we do all the math for you” (*Luna*, [60]).

In narrowing our analysis to shared finance applications advertising for close social relationships, two prominent trends emerge: shared finances lead directly to reducing relationship disputes, and sharing enables one party to subject another to their shared values.

Shared financial relationships are always healthy relationships. Our first finding explores how application descriptions construct the narrative that sharing finances, specifically via these applications directly, leads to a reduction in tension, arguments, and even fights between close relations. Sharing data and even formal financial instruments (e.g., bank accounts) according to many descriptions therefore could lead to a better, happier relationship. First, many applications describe the use of the application as ensuring that romantic couples using the software would “argue less ... with your soulmate” (*HoneyDue*, [43]), or contribute towards helping couples establish “no more fights” (*Flatastic*, [35]) by encountering financial challenges. One application described the arguments as directly being caused by the lack of ability to share finances and coordinate financial matters, particularly via these applications which could help to facilitate the coordination of a range of areas of application, including “chores, shopping, or expenses” (*Splitwise*, [96]).

Secondly, disputes about money (between a potential sharer or sharee) were framed as antithetical to not only a good relationship between close relationships, but also directly impacting on the atmosphere in a domestic environment or a “stress-free living experience” (*Shareroo*, [88]). Arguing in many of these application descriptions were described as taking time away from “the things that matter” (*Spend Together*, [102]) which were often left vague and explicitly down to the individual interpretation of the user viewing the application. Many of these statements were focused on the household context, where many even promised to “make living together more harmonious” (*Shareroo*, [88]) — through both the reduction of stress and arguments that could help “families thrive” (*Zeta*, [116]).

Sharing finances is showcased as a practice that is focused on creating a new relationship based on the sharing mechanisms that

¹<https://github.com/facundoolano/app-store-scraper>

²<https://github.com/facundoolano/google-play-scraper>

the applications provide — without necessarily exploring the reason for these tensions. In these situations, healthy relationships were possible through the reduction of the reported “*stress and awkwardness that money directly puts on relationships*” (DollarBird, [29]), where not having conversations about financial well-being could be directly down to this suggestion. Contentious talks about money in this marketing lingo, regardless of the result, were seen as unproductive, contradicting the positive impact of open communication in relationships as reported in many pieces of literature [78]. Thus, highlighting the difficulties of discussing finances cause people to become overly defensive, which could start arguments or disputes about money.

Getting on the same page, on the same app. Our second theme directly ties to how application descriptions construct the importance of being ‘on the same page’, or to be thinking in a similar fashion, to have the same amount of knowledge, or to have the same kind of understanding about a situation as others do. Application descriptions apply a prevalent narrative to how equating a shared understanding also meant a shared view of each others’ finances.

The person to initialize the application and sharing arrangement was framed as the one who managed the finances of the others, who was often encouraged to identify an application that could provide “*one account that does it all*” (Zeta, [116]) For example, in Goodbudget [39], the application showcases its functionality through a fictional story of one of their ideal end-users:

“Meet Dave. As the father of a growing family, Dave has a lot to keep track of. With Goodbudget, he’s able to manage his finances, stay on the same page with his family ... With a budget that syncs between his mobile devices and the web, Dave and his wife Sarah are always on the same page with their spending.”

Such scenarios were common where one application user, was in charge of viewing and “*keeping track of your partner’s expenses*” (Sesterce, [87]) through “*creating a clearer picture of who spent what*” (Buddy, [16]).

Staying up to date, through the functionality of view of transactions, linking up accounts, and synchronous updates to the superuser account ensured that nothing could potentially “*fall through the cracks*” (CloudSpouse, [23]). This also meant encouraging new financial management styles that may impact other members of the household such as “*throwing away paper bills*” (Spend Together, [102]), which could be an accounting practice that another partner may use. When one user has more authority (i.e., in situations involving abuse), this language might justify a user to use their preferred methods on others, potentially dominating shared finances.

We found that only a few applications had descriptions that encouraged collaboration and the importance of engaging in “*meaningful dialogue*” (HoneyDue, [43]) about a family or a couple’s goals and habits. This could be suggested via improving financial literacy, such as resources that provide insight into budgeting (Weekly [112]), or financial responsibilities together (CommonCard, [25]).

Only one application acknowledged the importance of close relationships being financially independent from each other, claiming that using the service would not require “*giving up your individual accounts*” but still underlining the importance of “*seeing each*

other’s transactions” (Zeta, [116]). In abusive or harmful relationships, justifying the discouragement of separating accounts or financial instruments may inadvertently reinforce harmful dominance in conversations about money.

5 Sharing dimensions and patterns

In this section, we report the four dimensions (D1 – D4) of financial sharing relationships we extracted via our application walkthroughs; that encompass the *Origin* of shared data, the *Relationship* of users in which the sharing takes place, the level of *Authority* bestowed to sharers and sharees, and the *Dynamic* of the duration of sharing. For each dimension, we clarify smaller sub-dimensions that describe the granularity of sharing between applications.

D1. Origin. The dimension of Origin refers to *where* the shared financial information originates, whether it is generated solely within the application, drawn from an external financial instrument, both, or neither. Such a dimension has considerable implications in the design of access control mechanisms and privacy features.

Most applications we examined enables *Application-based sharing*, where the shared data is entered or generated within the application. These systems operate independently of external financial accounts or funding instruments. In contrast, *financial instrument-based sharing*, involves integration with external financial accounts (e.g., joint bank accounts or other funding instruments) enabling functionalities like syncing account balances and activities, typically through API providers like Plaid. Transferring funds, such as via ACH push or pull, does not constitute sharing as it does not involve sharing data, activities, or balances. By connecting to a shared or joint funding instrument, shared data can flow from the account, often without fine-grained access control. This forces an all-or-nothing approach to sharing: either connect the account and share all its data or avoid connecting it and share nothing.

Hybrid sharing represents applications that synthesize both application and financial instruments, allowing users to link a shared financial account while creating and sharing data generated within the application. Similar to financial instrument-based sharing, hybrid systems often lack fine-grained controls to specify which aspects of account data are ported into the application and, by extension, what data is shared versus kept private.

Finally, *offline-based sharing* describe applications that cannot link any financial instruments or connect with another user through in-app functionality, as seen in [19] and [22]. Such systems taut the ability to support sharing by encouraging poor authentication practices, such as sharing authentication information by ‘sharing’ a family account across multiple devices (e.g., as seen in [63, 73]). For counts of applications categorized under these origin subdimensions, refer to Table 8 in the appendix.

D2. Relationship. The dimension of Relationship refers to the varying interpersonal dynamics involved in sharing financial instruments and data. At the most basic level, a user may have a single one-to-one relationship (1..1) for sharing, exemplified by services such as Tandem [101], where a user shares access exclusively with one partner, reinforcing a tightly controlled sharing environment.

Dimension		Description	Examples
Origin	<i>Application</i>	All shared data is entered and generated within the app itself	Flatastic [35], Splitwise [96]
	<i>Instrument</i>	All shared data originates from a shared financial instrument or funding source	Mint [70], Monarch Money [71]
	<i>Hybrid</i>	Shared data are generated in app and synced from a shared financial instrument	Zeta Joint [116], Honeydue [43]
	<i>Offline</i>	Unable to facilitate generation of shared data via application or linked financial instrument	Centsible [4], Goodbudget [9]
Relationship	<i>Single</i>	Restricted to a single other sharee	Tandem [101], Ivella [47]
	<i>Single Group</i>	Restricted to a single group of sharees	Flatastic [35], Monarch [71]
	<i>Multiple Singles</i>	Permits multiple single other sharees	Splitwise [96]
	<i>Multiple Groups</i>	Permits multiple groups of sharees	SettleUp [105], Splitwise [96]
Authority	<i>Collaborator</i>	Sharer and sharee have identical privileges for altering in-app data	Splitwise [96], Tricount [104]
	<i>Coordinator</i>	Sharer has greater configuration capabilities but equal in-app data privileges than sharee	Settle Up [105], YNAB [1]
	<i>Creator</i>	Sharer and sharee can only modify in-app data they authored	Flatastic [35], Split Money [65]
	<i>Broadcaster</i>	Sharer distributes data to sharee, who can only leave or view data.	Group Xpense [114], Cingo App [26]
Dynamic	<i>At-will/Ad-hoc</i>	Sharing is performed at-will and is reversible	Splitwise [96], Tricount [104]
	<i>Enduring</i>	Sharing relationship is permanent once established	Apple Family [5]

Table 1: Four dimensions of financial sharing mechanisms which address the origin of sharing (what and where), relationship (who), the authority between the sharer and the sharee (how), and the dynamic (when) of financial sharing instruments.

In this scenario, the sharing dynamic is straightforward and reflects a focused, reciprocal exchange between two individuals.

However, more complex configurations arise when a user engages in multiple, distinct one-to-one relationships ($M(1..1)$), as seen in applications like *Splitwise* [96]. Here, each sharing instance remains one-to-one, but the user manages multiple independent connections simultaneously. This model introduces a higher degree of management complexity, as users maintain separate streams of shared information with multiple individuals without a collective merging of those relationships.

Some applications allow for group-based sharing, either with one user sharing with multiple people ($1..M$) (e.g., *Flatastic* [35]), or where multiple individuals share information collectively within a group ($M(1..M)$). This form of shared interaction, such as in *SettleUp* [105], presents a more communal sharing structure wherein shared data flows bidirectionally among all members. These multi-party relationships introduce additional layers of trust, coordination, and governance, making them more dynamic and complex in terms of both information flow and social interaction.

D3. Authority. Some applications allow for group-based sharing, either with one user sharing with multiple people ($1..M$) (e.g., *Flatastic* [35]), or where multiple individuals share information collectively within a group ($M(1..M)$). This form of shared interaction, such as in *SettleUp* [105], presents a more communal sharing structure wherein shared data flows bidirectionally among all members. These multi-party relationships introduce additional layers of trust, coordination, and governance, making them more dynamic and complex in terms of both information flow and social interaction.

Upon establishing a shared relationship in an application, delegating specific (often security-relevant) privileges—referred to here as Authority—can be expressed as four common sub-dimensions: Collaborator, Coordinator, Broadcaster, or Creator. As privileges represent the most granular level of control in the dataset we examined, we mapped them to account functionalities for clarity (Figure 2). This class helps users distribute control over resources, with varying degrees of user autonomy and access privileges.

On one side, we observed symmetrical authorities in collaborative cases. As described by the Collaborator sub-dimension, sharer and sharee are permitted to add and remove others from the sharing relationship, as well as to add, edit, or remove others' data. However,

such flexibility can pose risks to data privacy and integrity when users can edit or remove each other's entries without accountability mechanisms like change logs or audit trails.

In contrast, asymmetric authority emerges when privileges are distributed unevenly by assigning different privileges based on roles (e.g., being a primary or secondary user) or actions (e.g. entry creation). These asymmetries, documented in prior research [73, 78], often manifest in restricted access where secondary users or authors of information are limited in their ability to modify or control shared data. This relationship, such as the applications characterized by the Broadcaster sub-dimension, may serve a protective function but also reflects a hierarchical structure within shared financial systems. This potentially leads to friction or imbalances in the collaborative use of digital platforms. We identified these forms of privileges where activity data might be shared with another individual, such as through alerts, events, or triggers, like the broadcast mode in Group Xpense [114]. We discuss these sub-dimensions in detail in Section 6.

D4. Dynamic. With the Dynamic dimension, we distinguish between two primary modes: at-will and enduring sharing. These two modes underscore the distinct temporal and intentional dimensions that shape the act of sharing, highlighting the varying degrees of control and permanence associated with different sharing practices.

At-will sharing is characterized by its flexibility and adaptability, allowing individuals to modify, adjust, or terminate their sharing behaviors in real time. This dynamic nature provides users with the agency to continuously reconfigure their relationships and access permissions according to changing circumstances or needs.

Conversely, *enduring* forms of sharing are marked by their permanence and long-lasting implications. Unlike the transient nature of at-will sharing, enduring sharing often persists until a significant event, such as the dissolution of an entity or formal termination, actively halts the process. As a result, enduring sharing is less susceptible to momentary adjustments and tends to be embedded within more stable or formalized relational structures.

6 Sharing patterns

Through the marketing analysis and user journey audit, we identified discrete sharing patterns that draw on different facets of our

User privileges		Collaborator		Coordinator		Creator		Broadcaster	
		Sharer	Sharee	Sharer	Sharee	Sharer	Sharee	Sharer	Sharee
Space	Add another to space	●	●	●	○	●	●	●	○
	Delete Space	○	○	●	○	○	○	○	○
	Leave space	○	○	○	○	○	○	○	○
	Modify another privilege	○	○	○	○	○	○	○	○
	Remove another from space	●	●	●	○	●	●	●	○
	Remove initiator from space	●	●	○	○	●	●	○	○
Entries	Add own entry	●	●	●	●	●	●	●	○
	Edit own entry	●	●	●	●	●	●	●	○
	Edit another's entry	●	●	●	●	○	○	○	○
	Delete own entry	●	●	●	●	●	●	●	○
	Delete another's entry	●	●	●	●	○	○	○	○
	View own entry	●	●	●	●	●	●	●	○
	View another's entry	●	●	●	●	●	●	○	●

Table 2: Entries are shared data objects while Spaces refer to a domain where entries located in it are shared amongst members. Sharer is the user who starts the sharing relationship, and Sharee refers to the user who joins the sharing arrangement upon the sharer's invitation. ● means regularly recorded, ○ means not observed in our dataset, while ○ means often observed in our analysis. Blank means that this privilege is not applicable in this context.

four dimensions (Section 5). In this context, we define *patterns* as recurring configurations that act as standard reference points for user interface (UI) and interaction designers when creating or refining financial applications. While similar in verbiage, sharing patterns are different from design patterns which impose a specific solution or best practice to a common software problem.

Entries are shared data objects (e.g., such as payment, charges) while *Spaces* (e.g., households, tabs) refer to a domain where entries located in it are shared amongst members. We identified four patterns of sharing among close social relationships in these applications, which we have labeled to distinguish their unique combinations of notifications, privileges, and system behaviors: Collaborator, Coordinator, Creator, and Broadcaster (see *Appendix Table 7* for the mapping of dimensions to patterns). We incorporate scenarios of close social relationships to better showcase the risks and challenges of misapplying sharing patterns in social contexts, and how abusive use of such systems can incur negative outcomes for those engaged in sharing.

Collaborator. The Collaborator pattern is characterized by equal privileges for sharers and sharees at the space and entry levels. This illusion of symmetry allows the sharee to have the same abilities as the sharer, including managing entries and the shared space. This pattern works to promote a collaborative environment where no user has more control than another. The Collaborator pattern is exemplified in the app *Balance: Couple Budget & Money* [97], where users can delete accounts, create and modify entries, and make changes regardless of authorship. All parties have equal access to manage shared financial information, emphasizing mutual responsibility and decision-making.

While this pattern seems to foster flexibility on the surface, having equal privileges can lead to negative impacts on information accessibility, integrity, and transparency of actions. In the scenario of a multi-generational household (e.g., see [110]), members might use a shared financial application to collectively share financial responsibilities, including utility bills, grocery budgets, and a shared savings fund for emergencies. However, if one user were to accidentally edit (e.g., change the amount spent) of an existing, legitimate

Pattern	Count	Applications with the pattern
Collaborator	13	Balance: Couple Budget & Money, Smoov Finance, Bill Magic, Expenses, Budget Planner & Manager Monee, Home Budget Tracker & Planner (Previously Shareoo), Honeydue, Our Expenses: Household budget (previously expenses), Sesterce - split expense, Splid - Split group bills, Splitt, Splitwise, Tricount
Coordinator	11	Bill Bear, iSaveMoneyGo: Budget Tracker, OurFlat: Household & Chores, MoneySpaces, Lunch Money, Monarch Money, Quicken Simplifi, Saldo, Settle Up - Group Expenses, Spend Together, Wally
Creator	3	Split Money, Flatastic - Manage your home, Tandem
Broadcaster	2	Cingo App, Group Xpense

Table 3: Frequency table tallying the occurrence of identified sharing patterns in audited applications. We identify that Collaborator is the most prevalent pattern while Broadcaster is the least prevalent pattern among our sample set.

payment, this could cause confusion in future actions (e.g., budgeting). If one member—intentionally or otherwise—alters past savings contributions to reflect higher amounts for personal credit, other members may not notice. Finally, should an application lack a change log, other members of the household could not trace who adjusted the emergency fund's withdrawal target, leading to misunderstandings between users.

Coordinator. In the Coordinator design pattern, the sharer has greater privileges than the sharee, specifically at the space level. Only the person sharing has administrative ('admin') control over the shared space, enabling them to perform high-level actions such as adding/removing participants, assigning privileges, and even deleting the entire space. At the entry level, the Coordinator pattern treats both the sharer and sharees equally in terms of privileges, allowing all users to freely edit or delete their own entries and those of others. In the Coordinator pattern of the budgeting app Bill Bear [98], the sharer (admin-like role) has control over key aspects of the space, such as managing sharees, assigning privileges, and deleting

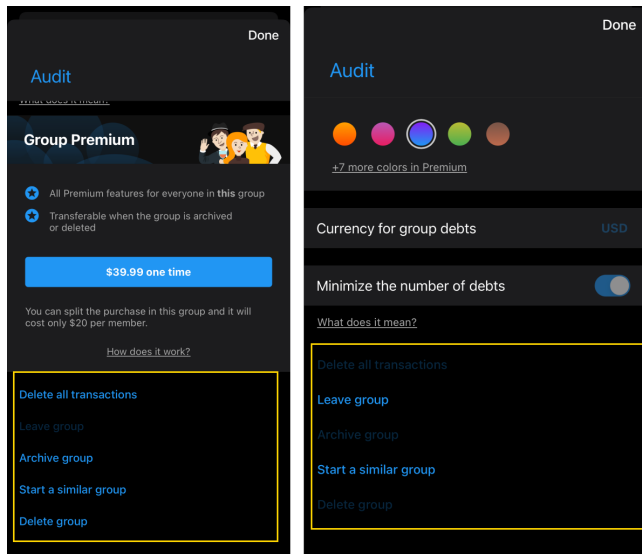


Figure 3: Examples of the *Coordinator* pattern at the space level. [Left] Settle Up - Group Expenses (Tina’s device), shows Tina, the initiator, can delete the group but cannot leave it. [Right] (Eli’s device) shows Eli can leave the group but cannot delete it. This illustrates the *Coordinator* pattern, where the initiator has additional space management privileges compared to participants.

the space. However, sharees are unable to remove the sharer, delete the space, or modify its name. Despite these limitations, sharees can still add or remove other participants, manifesting a balance between shared responsibility and limited control.

Although an admin-like role can ensure more oversight over high-level actions, the symmetry of privileges at entry level can also pose risk to information integrity. For instance, in a scenario involving friends who decide to coordinate the co-funding of a shared holiday via an application (e.g., see [17]), the group is mostly dependent on the competency of a single admin-like user. In the situation where one user were to enter inaccurate information — either by deliberately inflating the cost of a transaction or adding a duplicate transaction — the admin has the authority to remove specific privileges from this user. However, sharees may feel excluded from higher-level decisions (e.g., removing specific members, renaming shared spaces), particularly if such decisions were not justified to the wider user group, highlighting a gap in transparency and inclusivity.

Creator. The Creator pattern emphasizes the difference between entry-level and space-level privileges, with a focus on the control given to authors or ‘creators’. This attempts to strike a balance between individual control and shared authority, allowing structured collaboration while maintaining ownership over individual contributions. At the space level, user privileges are balanced; privileges are shared equally between the sharer and sharee, enabling them to invite, remove, or leave the space. However, entry level

privileges are centered on authorship, ensuring that only the creator can make changes or remove entries. This setup is seen in the budgeting app Split Money [65], where the creator of an expense entry has exclusive rights to modify or delete it.

In a scenario whereby a guardianship role may be required; such as an adult child providing for an older parent (e.g., see [53]), authorship can both encourage trust but problematize shared care. While authorship control ensures accountability, it can lead to bottlenecks in shared tasks, as when a user makes a mistake (e.g., inaccurate entry) the original user always has to correct this instead of delegating it. Equal privileges at the space level could also lead to disagreements such as the guardianship user adds another participant (e.g., a family friend), the other user might feel this dilutes the privacy of their space.

Broadcaster. In the Broadcaster pattern, privileges are asymmetric, with the sharee acting as a passive observer. The sharer has total control over entries and how such entries are accessed by the recipient. When invited to the shared space, the sharee can only view the entries and has the option to leave. This pattern allows the sharer to maintain complete control over the shared information, limiting the sharee’s interaction to viewing only. The Cingo App [26] is an example of the Broadcaster pattern in a wealth management tool.

This pattern is valuable when the sharer wants to control their financial data while enabling oversight. In the scenario involving a young adult with mental health issues and impulsive spending who might update a supportive friend on their finances (e.g., see [9]). The advantage of this type of one-way interaction is that it allows the sharer to control the information they share. However, it may hinder collaboration as the information recipients (sharees) cannot actively manage or respond to the shared financial information.

7 Discussion and Concluding Remarks

With the rapid adoption of financial tools, we have evidenced that there is a need to document sharing patterns embedded in system design to capture the evolving methods of financial collaboration. In this study, we have provided the most comprehensive analysis to date of 31 consumer-facing financial applications focused on budgeting, payments, and long-term planning, with an emphasis on financial management within the context of close relationships. Through identifying the predominant messages in financial sharing applications (Section 4), shared dimensions (Section 5), and overarching sharing patterns (Section 6), we reflect on the implications of our investigation into this rapidly growing area of human financial interaction [8, 37, 58, 78]. To contrast decades of conceptual access control literature, we offer a concise overview of social, emotional, and practical factors in financial sharing, ideally making it easier to identify the core building blocks to build new financial technologies.

7.1 Improving personal financial management tools

The sharing dimensions outlined in Section 5 are informed by the observations in our studies. They are intended to be descriptive rather than prescriptive, offering a framework for understanding the types of systems available to consumers today and the associated privacy and usability implications. Although sharing mechanisms

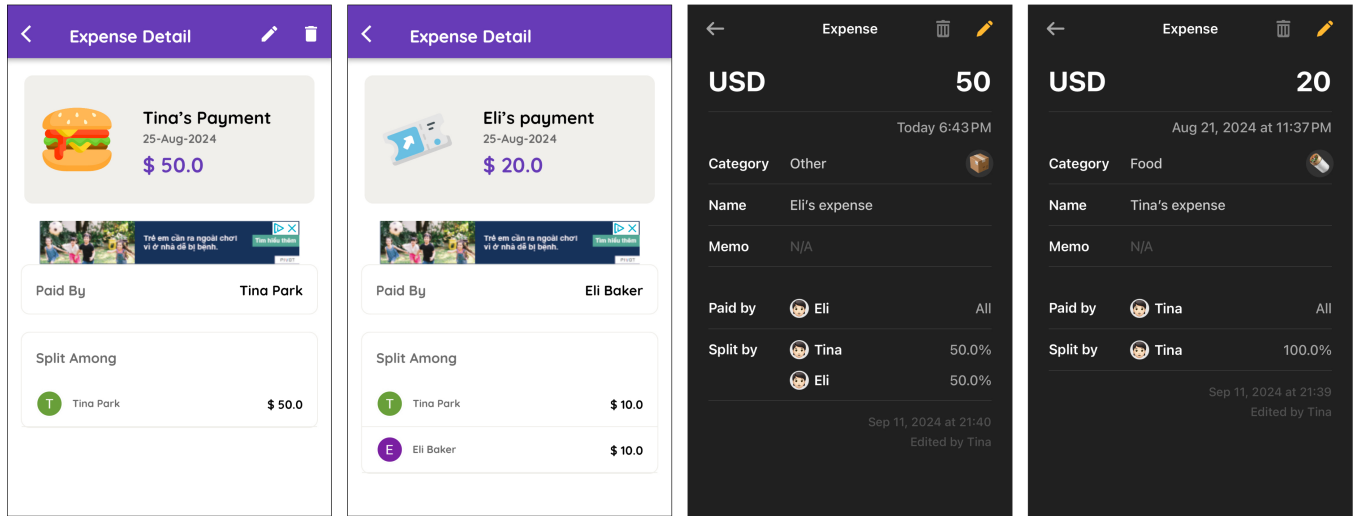


Figure 4: *Creator* and *Collaborator* pattern examples at the Entry level, discussed left to right. Split Money (Tina’s device), show Tina can edit/delete her own entry (shown in top right) [Left:A] but not Eli’s [Left:B], demonstrating the *Creator* pattern, where only the original creator modifies their entry. The two right screenshots, from Tricount (Tina’s device) [Right:A], show Tina can modify both her and Eli’s entries [Right:B], illustrating the *Collaborator* pattern, where all parties share equal privileges to edit any entry.

between multiple accounts have been in place for consumers to use for many years [54], many of these sharing mechanisms are missing the vital nuts and bolts that make these applications viable for those who may need to manage their money the most [8, 81]. Nevertheless, our research identified several ways to anticipate improvements in how such systems were implemented and marketed to end users. Ultimately, the effectiveness of these systems, irrespective of how they are marketed, hinges on thoughtful design that centers user needs which we now discuss.

7.1.1 Transparency around sharing capabilities. Users naturally have expectations around what constitutes ‘sharing’ [63], and while some applications in our data set were upfront about the sharing capabilities, many applications under review were not. For this work, it was sometimes necessary to revisit the applications multiple times to accurately identify what was being shared, at what time, and with whom. In the context of financial wellbeing, where knowledge of an individual’s financial situation may be used coercively [11, 73], potentially under the guise of being transparent, this ambiguity is a problem that warrants further attention.

We believe that the practice of data privacy labeling [4], traditionally used to inform users about how applications manage their data and now a standard feature in the app store, could be beneficial in this context. We recommend each listing of financial applications to explicitly state if it enables sharing with other users, and that this information be presented clearly and consistently. Here, our sharing dimensions – Origin, Relationship, Authority, and Dynamic (Section 5) – can provide the language needed to clearly communicate to users what information is to be shared, with whom, for how long, and the extent to which users can modify such a sharing relationship. App developers could also use labels

to convey the underlying financial sharing pattern of the app, allowing users to make a more informed decision about whether to use the application [113].

Indeed, consistency alone does not guarantee good or even ethical design. Nevertheless, it enables users to compare and determine what features are important to the sharing relationship they wish to initiate. For example, labeling applications as the *Broadcaster* type does not imply that all such applications will behave the same way. However, such label allows users to recognize that they want to share their own financial information rather than viewing other’s [8]. In this regard, patterns help to communicate familiar pathways to users, while highlighting the level of authority, the expectation on agency, and the freedom to contribute to shared environments.

7.1.2 Sharing patterns in abuse or misuse cases. Designing new systems naturally involves tackling the challenges of social relations and norms, as well as providing support for the configuration work needed across all stages of interacting with finances. Specifically, our analysis reveals that many applications often aggressively promote sharing as a positive action [2], particularly in situations involving the *Collaborator* or *Coordinator* patterns. For many users, such as survivors of intimate partner violence [11], sex workers [64], and older adults [53], whom are at greater risk of financial threats, quick and easy terminations are more a matter of safety than that of relieving a burden of frustration or convenience [73]. Jacobs et al. [48] and Park et al. [78] identify that many couples felt judged by intimate partners with viewing purchase history, which is at odds with our findings where applications actively promote them to do so, and give users little recourse to hide their activity (Section 4). As the primary reason for many couples sharing accounts is financial convenience [78] – something that all applications in our study promoted – this is all the more reason to ensure

these apps are modeled safely, and designers are conscious that abuse is a prevalent issue for many.

Providing users with granular low-level controls, such as adjusting the transparency of transactions and accounts or severing a connected joint bank account (Section 6), could be one of the concrete ways to balance out the inequitable permissions in these sharing patterns. For instance, giving sharees the ability to leave a space or change the visibility of their own transactions could immediately improve their ability to contribute to a shared space (Table 9).

Even without abuse, developers may wish to consider how user induced error (as discussed in Section 4 scenarios) could introduce challenges to wider user groups. The lack of mechanisms to ensure information integrity in collaborative authority patterns (Collaborator, Coordinator) while seemingly equal incur unique challenges around trustworthiness of contributions. Without features like change logs, audit trails, or version backups, users have limited visibility into the changes made to shared financial data, and can cause conflict and subject them to manipulation. We recognize that shared financial data often originates from joint financial instruments, which typically lack metadata identifying who performed a given action. This highlights the need to rethink how action logs can and should be implemented, potentially at the financial instrument level.

7.2 Bridging the gap between dimensions, patterns, and systems.

Our findings contribute to the growing body of HCI research that critiques the individualized approach to finances [34, 77, 81], emphasizing how digital systems often fail to capture the social meanings of value. While it is crucial to understand the social context of financial sharing, we stress the importance of examining these dynamics at a granular level to assess how they are, or are not, reflected in system designs. Instead of characterizing entire financial systems from the top down, we can focus on characterizing specific areas to help inform the design of “*non-normative and diverse design*” [94] by codifying the makeups of financial sharing applications and offering ways to improve them.

Our work offers new contributions to build on the exploration of low-level of financial functions (e.g., like recipes offered by Elsden et al. [32]), alongside higher-level descriptions of system types that can be investigated with users in practice. develop interfaces to meet the diverse needs of users and promote equitable sharing. Here, we make explicit as to how designers, researchers, developers, and users may leverage our discoveries, and what these mean for the future of financial technologies.

7.2.1 Framing references and testing patterns. Although some valuable work has scrutinized various monetary sharing practices [50, 75, 107], the challenge remains in lacking a frame of reference to compare and evaluate these systems. While some dimensions are consistent across platforms, our audit revealed no single, uniform user journey. Instead, applications tend to cluster into small groups with similar dimensions and patterns of authority. As such, upon reviewing our results, it is unclear whether a ‘gold standard’ for such sharing pattern exists. Further work is needed to determine

whether applications with specific qualities are more suitable for financial sharing in complex social contexts.

These sharing patterns are not just practical design elements, but reflect underlying social and financial dynamics within relationship, influencing how technology supports or hinders collaborative decision-making. To meaningfully support activities in everyday management of money, we need testable sharing patterns by making applications and scenarios, such as our fictive examples in Section 4), a central focus. Comparative studies across various sharing patterns could offer insights into these inquiries and how our devised dimensions could influence financial well-being, independence, and literacy. Future studies might focus on areas like how partners negotiate access to joint accounts, how notifications are shared, or how budgeting tools balance individual and shared expenses. We are enthusiastic about the potential to gathering feedback from designers and users to refine and expand beyond common sharing patterns.

7.2.2 Expanding the scope of financial review. In this work, we made a deliberate decision to avoid applications that required personally identifiable information (PII) from members of the research team, such as Social Security numbers (SSNs) or other personal data (e.g., phone numbers, bank account information). This choice was motivated by privacy concerns and the desire to mitigate the risks associated with exposing such information. However, this limited our focus to specific types of financial applications. Moving forward, we are motivated to explore alternative ways that allow us to navigate this limitation while conducting meaningful research.

One potential avenue involves leveraging the permissions granted to auditors within financial infrastructures [90], who typically have privileged access to sensitive financial data to evaluate companies’ compliance with legal and regulatory frameworks. Auditors, unlike non-auditing entities like our research team [12], can collaborate with other auditors or third parties to obtain and provide us with necessary data while maintaining strict privacy and compliance guidelines. Such collaboration will allow us to explore new research opportunities without directly handling sensitive personal information ourselves.

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References

- [1] You Need a Budget. 2023. YNAB. <http://apps.apple.com/us/app/ynab-budgeting-finance/id1010865877>
- [2] Amelia Acker and Dhiraj Murthy. 2018. Venmo: Understanding Mobile Payments as Social Media. In *Proceedings of the 9th International Conference on Social Media and Society (SMSociety '18)*. Association for Computing Machinery, New York, NY, USA, 5–12. <https://doi.org/10.1145/3217804.3217892>
- [3] A. A. Adams and S. A. Williams. 2014. What’s yours is mine and what’s mine’s my own: joint accounts and digital identity. *ACM SIGCAS Computers and Society* 44, 1 (April 2014), 15–26. <https://doi.org/10.1145/2602147.2602150>
- [4] Deena Alghamdi, Ivan Flechais, and Marina Jirotko. 2015. Security practices for households bank customers in the kingdom of Saudi Arabia. In *Proceedings of the Eleventh USENIX Conference on Usable Privacy and Security (SOUPS '15)*. USENIX Association, USA, 297–308.
- [5] Apple. 2023. Apple Card. <https://www.apple.com/apple-card/family/>

- [6] Kristy L. Archuleta. 2013. Couples, Money, and Expectations: Negotiating Financial Management Roles to Increase Relationship Satisfaction. *Marriage & Family Review* 49, 5 (July 2013), 391–411. <https://doi.org/10.1080/01494929.2013.766296> Publisher: Routledge _eprint: <https://doi.org/10.1080/01494929.2013.766296>
- [7] B. Barros Pena. 2022. Curb your enthusiasm: The dissonances of digitising personal finance. In *Proceedings of DRS*, Vol. 67. Design Research Society, Bilbao, Spain, 1–18. <https://doi.org/10.21606/drs.2022.302> ISSN: 2398-3132.
- [8] Belén Barros Pena, Bailey Kursar, Rachel E. Clarke, Katie Alpin, Merlyn Holkar, and John Vines. 2021. "Pick Someone Who Can Kick Your Ass" - Moneywork in Financial Third Party Access. *Proceedings of the ACM on Human-Computer Interaction* 4, CSCW3 (Jan. 2021), 218:1–218:28. <https://doi.org/10.1145/3432917>
- [9] Belén Barros Pena, Bailey Kursar, Rachel E. Clarke, Katie Alpin, Merlyn Holkar, and John Vines. 2021. Financial Technologies in the Cycle of Poor Mental Health and Financial Hardship: Towards Financial Citizenship. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (Yokohama, Japan) (CHI '21). Association for Computing Machinery, New York, NY, USA, Article 48, 16 pages. <https://doi.org/10.1145/3411764.3445251>
- [10] Gregor Becker. 2017. Does FinTech Affect Household Saving Behavior? Working Paper.
- [11] Rosanna Bellini. 2023. Paying the Price: When Intimate Partners Use Technology for Financial Harm. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (CHI '23). Association for Computing Machinery, New York, NY, USA, 1–17. <https://doi.org/10.1145/3544548.3581101>
- [12] Rosanna Bellini, Kevin Lee, Megan A. Brown, Jeremy Shaffer, Rasika Bhalerao, and Thomas Ristenpart. 2023. The Digital-Safety Risks of Financial Technologies for Survivors of Intimate Partner Violence. In *32nd USENIX Security Symposium* (USENIX Security 23). USENIX Association, Anaheim, CA, 87–104. <https://www.usenix.org/conference/usenixsecurity23/presentation/bellini>
- [13] Virginia Braun and Victoria Clarke. 2019. Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health* 11, 4 (Aug. 2019), 589–597. <https://doi.org/10.1080/2159676X.2019.1628806> Publisher: Routledge _eprint: <https://doi.org/10.1080/2159676X.2019.1628806>
- [14] Jeff Brozena, Johnna Blair, Thomas Richardson, Mark Matthews, Dahlia Mukherjee, Erika F. H. Saunders, and Saeed Abdullah. 2024. Supportive Fintech for Individuals with Bipolar Disorder: Financial Data Sharing Preferences for Longitudinal Care Management. In *Proceedings of the CHI Conference on Human Factors in Computing Systems* (CHI '24). Association for Computing Machinery, New York, NY, USA, 1–15. <https://doi.org/10.1145/3613904.3642645>
- [15] Di Bu, Tobin Hanspal, Yin Liao, and Yong Liu. 2022. Cultivating Self-Control in FinTech: Evidence from a Field Experiment on Online Consumer Borrowing. *Journal of Financial and Quantitative Analysis* 57, 6 (Sept. 2022), 2208–2250. <https://doi.org/10.1017/S0022109021000314> Publisher: Cambridge University Press.
- [16] Buddy. 2023. Buddy. <https://apps.apple.com/us/app/buddy-budget-save-money/id936422955>
- [17] Monica Caraway, Daniel A. Epstein, and Sean A. Munson. 2017. Friends Don't Need Receipts: The Curious Case of Social Awareness Streams in the Mobile Payment App Venmo. *Proceedings of the ACM on Human-Computer Interaction* 1, CSCW (Dec. 2017), 28:1–28:17. <https://doi.org/10.1145/3134663>
- [18] Bruce Carlin, Arna Olafsson, and Michaela Pagel. 2017. FinTech Adoption Across Generations: Financial Fitness in the Information Age. <https://doi.org/10.3386/w23798>
- [19] Centsible. 2023. Centsible. <https://apps.apple.com/us/app/centsible-budget-finance/id1609692064>
- [20] Sayan Chaudhry and Chinmay Kulkarni. 2021. Design Patterns of Investing Apps and Their Effects on Investing Behaviors. In *Proceedings of the 2021 ACM Designing Interactive Systems Conference* (DIS '21). Association for Computing Machinery, New York, NY, USA, 777–788. <https://doi.org/10.1145/3461778.3462008>
- [21] George Hope Chidziwisan, Susan Wyche, and Rellikson Kisyula. 2020. SmartChama: Designing Collaborative Digital Financial Systems for Chama Groups in Kenya. In *Proceedings of the 2020 International Conference on Information and Communication Technologies and Development* (ICTD '20). Association for Computing Machinery, New York, NY, USA, 1–12. <https://doi.org/10.1145/3392561.3394641>
- [22] Chronical. 2024. Chronical. <https://apps.apple.com/us/app/chronicle-bill-organizer/id572561420>
- [23] CloudSpouse. 2023. CloudSpouse. <https://apps.apple.com/us/app/cloudspouse-couples-finance/id1526804553>
- [24] Lina Coelho. 2014. My Money, Your Money, Our Money: Contributions to the Study of Couples' Financial Management in Portugal. *RCCS Annual Review. A selection from the Portuguese journal Revista Crítica de Ciências Sociais* 2, 6 (Oct. 2014), 1–10. <https://doi.org/10.4000/rccsar.546> Number: 6 Publisher: Centro de Estudos Sociais da Universidade de Coimbra.
- [25] CommonCard. 2023. CommonCard. <https://apps.apple.com/us/app/commoncard/id1598016710>
- [26] CINGO Corporation. 2024. Cingo App. <https://apps.apple.com/in/app/cingo-app/id6449768085>
- [27] Jay L. Cunningham, Sydney T. Nguyen, Julie A. Kientz, and Daniela Rosner. 2022. The Cost of Culture: An Analysis of Cash App and the Financial Inclusion of Black American Communities. In *Designing Interactive Systems Conference*. ACM, Virtual Event Australia, 612–628. <https://doi.org/10.1145/3532106.3533569>
- [28] Harshal Dev, Raj Gupta, and Dhruv Kumar. 2024. From Cash to Cashless: UPI's Impact on Spending Behavior among Indian Users. In *Extended Abstracts of the 2024 CHI Conference on Human Factors in Computing Systems* (CHI EA '24). Association for Computing Machinery, New York, NY, USA, 1–10. <https://doi.org/10.1145/3613905.3651050>
- [29] Dollarbird. 2023. Dollarbird Pro. <https://apps.apple.com/us/app/dollarbird-pro/id1214299218>
- [30] Earnest and Young. 2024. *EY FinTech Adoption Index*. Technical Report. Earnest and Young.
- [31] Chris Elsdén, Tom Feltwell, Belén Barros Pena, Bettina Nissen, Inte Gloerich, Chris Speed, and John Vines. 2020. Designing Futures of Money and FinTech. In *Companion Publication of the 2020 ACM Designing Interactive Systems Conference* (DIS' 20 Companion). Association for Computing Machinery, New York, NY, USA, 429–432. <https://doi.org/10.1145/3393914.3395904>
- [32] Chris Elsdén, Tom Feltwell, Shaun Lawson, and John Vines. 2019. Recipes for Programmable Money. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (CHI '19). Association for Computing Machinery, New York, NY, USA, 1–13. <https://doi.org/10.1145/3290605.3300481>
- [33] Chris Elsdén, Evan Morgan, and Chris Speed. 2021. Creative Transactions: Special Digital Monies in 'Break Kickstarter' Crowdfunding Campaigns. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (CHI '21). Association for Computing Machinery, New York, NY, USA, 1–13. <https://doi.org/10.1145/3411764.3445632>
- [34] Chris Elsdén and Chris Speed. 2022. Designing new money: Creative transactions on Twitch. In *Design Research Society. DRS Biennial Conference Series* 1, 1–8. Issue 1. <https://dl.designresearchsociety.org/drs-conference-papers/drs2022/researchpapers/192>
- [35] Flatastic. 2023. Flatastic. <https://apps.apple.com/us/app/flatastic-manage-your-home/id840810742>
- [36] Jonathan Fu and Mrinal Mishra. 2020. The Global Impact of COVID-19 on Fintech Adoption. *Swiss Finance Institute Research Paper* 10, 20-38 (May 2020), 20–38. <https://doi.org/10.5167/uzh-187776>
- [37] Joe J. Gladstone, Emily N. Garbinsky, and Cassie Mogilner. 2022. Pooling finances and relationship satisfaction. *Journal of Personality and Social Psychology* 123 (2022), 1293–1314. <https://doi.org/10.1037/pspi0000388> Place: US Publisher: American Psychological Association.
- [38] Marieke de Goede. 2010. *Financial Security*. Routledge, London, UK. <https://www.routledge.com/The-Routledge-Handbook-of-New-Security-Studies/Burgess/p/book/9780415539333> Num Pages: 10.
- [39] Goodbudget. 2023. Goodbudget. <https://apps.apple.com/us/app/goodbudget-budget-planner/id471112395>
- [40] Thilina Halloluwa, Hakim Usoof, and Dhaval Vyas. 2018. Sociocultural Practices that Make Microfinance Work: A Case Study from Sri Lanka. *Proceedings of the ACM on Human-Computer Interaction* 2, CSCW (Nov. 2018), 65:1–65:22. <https://doi.org/10.1145/3274334>
- [41] Changyang He, Lu He, Zhicong Lu, and Bo Li. 2023. 'I Have to Use My Son's QR Code to Run the Business': Unpacking Street Vendors' Challenges in Mobile Money Collection in China. *Proceedings of the ACM on Human-Computer Interaction* 7, CSCW1 (April 2023), 60:1–60:28. <https://doi.org/10.1145/3579493>
- [42] Ron Hirschprung, Eran Toch, Hadas Schwartz-Chassidim, Tamir Mendel, and Oded Maimon. 2017. Analyzing and Optimizing Access Control Choice Architectures in Online Social Networks. *ACM Trans. Intell. Syst. Technol.* 8, 4, Article 57 (May 2017), 22 pages. <https://doi.org/10.1145/3046676>
- [43] Honeydue. 2023. Honeydue. <https://apps.apple.com/us/app/honeydue-couples-finance/id1157633945>
- [44] Srihari Hulikal Muralidhar, Claus Bossen, Apurv Mehra, and Jacki O'Neill. 2018. Digitizing Monetary Ecologies: Intended and Unintended Consequences of Introducing a Financial Management App in a Low-Resource Setting. *Proceedings of the ACM on Human-Computer Interaction* 2, CSCW (Nov. 2018), 72:1–72:17. <https://doi.org/10.1145/3274341>
- [45] Edwin Hutchins. 1996. *Cognition in the Wild* (revised ed. edition ed.). MIT Press, Cambridge, Mass.
- [46] International Rescue Committee (IRC). 2024. What the cost of living crisis looks like around the world. <https://www.rescue.org/article/what-cost-living-crisis-looks-around-world>
- [47] Ivella. 2023. Ivella. <https://apps.apple.com/us/app/ivella/id1527883924>
- [48] Maia Jacobs, Henriette Cramer, and Louise Barkhuus. 2016. Caring About Sharing: Couples' Practices in Single User Device Access. In *Proceedings of the 19th International Conference on Supporting Group Work*. ACM, Sanibel Island Florida USA, 235–243. <https://doi.org/10.1145/2957276.2957296>
- [49] Haojian Jin, Hong Shen, Mayank Jain, Swarn Kumar, and Jason I. Hong. 2021. Lean Privacy Review: Collecting Users' Privacy Concerns of Data Practices at a Low Cost. *ACM Trans. Comput.-Hum. Interact.* 28, 5 (Aug. 2021), 34:1–34:55. <https://doi.org/10.1145/3463910>

- [50] Joseph Jofish Kaye, Mary McCuiston, Rebecca Gulotta, and David A. Shamma. 2014. Money talks: tracking personal finances. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14)*. Association for Computing Machinery, New York, NY, USA, 521–530. <https://doi.org/10.1145/2556288.2556975>
- [51] Brian C. Keegan, Shakked Lev, and Ofer Arazy. 2016. Analyzing Organizational Routines in Online Knowledge Collaborations: A Case for Sequence Analysis in CSCW. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing* (San Francisco, California, USA) (CSCW '16). Association for Computing Machinery, New York, NY, USA, 1065–1079. <https://doi.org/10.1145/2818048.2819962>
- [52] Alexis Krivkovich, Olivia White, Zac Townsend, and John Euart. 2020. How US customers' attitudes to fintech are shifting during the pandemic. <https://www.mckinsey.com/industries/financial-services/our-insights/how-us-customers-attitudes-to-fintech-are-shifting-during-the-pandemic>
- [53] Celine Latulipe, Ronnie Dsouza, and Murray Cumbers. 2022. Unofficial Proxies: How Close Others Help Older Adults with Banking. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*. Association for Computing Machinery, New York, NY, USA, 1–13. <https://doi.org/10.1145/3491102.3501845>
- [54] Sung Kwan Lee. 2019. Fintech Nudges: Overspending Messages and Personal Finance Management. <https://doi.org/10.2139/ssrn.3390777>
- [55] Makayla Lewis and Mark Perry. 2019. Follow the Money: Managing Personal Finance Digitally. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. ACM, Glasgow Scotland Uk, 1–14. <https://doi.org/10.1145/3290605.3300620>
- [56] Jie Li, Yu Wu, and Jing Jian Xiao. 2020. The impact of digital finance on household consumption: Evidence from China. *Economic Modelling* 86 (March 2020), 317–326. <https://doi.org/10.1016/j.econmod.2019.09.027>
- [57] Soo Ling Lim, Peter J. Bentley, Natalie Kanakam, Fuyuki Ishikawa, and Shinichi Honiden. 2015. Investigating Country Differences in Mobile App User Behavior and Challenges for Software Engineering. *IEEE Transactions on Software Engineering* 41, 1 (2015), 40–64. <https://doi.org/10.1109/TSE.2014.2360674>
- [58] Junchao Lin, Jason I. Hong, and Laura Dabbish. 2021. "It's our mutual responsibility to share": The Evolution of Account Sharing in Romantic Couples. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (April 2021), 1–27. <https://doi.org/10.1145/3449234>
- [59] Junchao Lin, Irene Yu, Jason Hong, and Laura Dabbish. 2020. "Am I Overwhelmed with this Information?": A Diary Study of Couples' Everyday Account Sharing. In *Conference Companion Publication of the 2020 on Computer Supported Cooperative Work and Social Computing (CSCW '20 Companion)*. Association for Computing Machinery, New York, NY, USA, 311–315. <https://doi.org/10.1145/3406865.3418340>
- [60] Luna. 2023. Luna. <https://apps.apple.com/us/app/luna-split-bills-expenses/id1535754708>
- [61] Sumei Luo, Yongkun Sun, and Rui Zhou. 2022. Can fintech innovation promote household consumption? Evidence from China family panel studies. *International Review of Financial Analysis* 82 (July 2022), 102137. <https://doi.org/10.1016/j.irfa.2022.102137>
- [62] Bill Magic. 2023. Bill Magic. <https://www.billmagic.app>
- [63] Tara Matthews, Kerwell Liao, Anna Turner, Marianne Berkovich, Robert Reeder, and Sunny Consolvo. 2016. "She'll just grab any device that's closer": A Study of Everyday Device & Account Sharing in Households. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*. Association for Computing Machinery, New York, NY, USA, 5921–5932. <https://doi.org/10.1145/2858036.2858051>
- [64] Allison McDonald, Catherine Barwulor, Michelle L. Mazurek, F. Schaub, and Elissa M. Redmiles. 2021. "It's stressful having all these phones": Investigating Sex Workers' Safety Goals, Risks, and Practices Online. In *30th USENIX Security Symposium (USENIX Security 21)*. USENIX Association, Online, 375–392. <https://www.usenix.org/conference/usenixsecurity21/presentation/mcdonald>
- [65] Anil Meena. 2024. Split Money. <https://apps.apple.com/us/app/split-money-expense-manager/id1673207829>
- [66] Hamid Mehmood, Tallal Ahmad, Lubna Razaq, Shrirang Mare, Maryem Zafar Usmani, Richard Anderson, and Agha Ali Raza. 2019. Towards Digitization of Collaborative Savings Among Low-Income Groups. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (Nov. 2019), 35:1–35:30. <https://doi.org/10.1145/3274304>
- [67] Apurv Mehra, Srihari Muralidhar, Sambhav Satija, Anupama Dhreshwar, and Jacki O'Neill. 2018. Prayana: Intermediated Financial Management in Resource-Constrained Settings. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*. Association for Computing Machinery, New York, NY, USA, 1–13. <https://doi.org/10.1145/3173574.3173963>
- [68] Woldmaria F. Mesfin. 2012. Mobile information systems architecture for everyday money practice. In *Proceedings of the International Conference on Management of Emergent Digital EcoSystems (MEDES '12)*. Association for Computing Machinery, New York, NY, USA, 205–212. <https://doi.org/10.1145/2457276.2457316>
- [69] David R. Millen, Claudio Pinhanez, Jofish Kaye, Silvia Cristina Sardela Bianchi, and John Vines. 2015. Collaboration and Social Computing in Emerging Financial Services. In *Proceedings of the 18th ACM Conference Companion on Computer Supported Cooperative Work & Social Computing (CSCW'15 Companion)*. Association for Computing Machinery, New York, NY, USA, 309–312. <https://doi.org/10.1145/2685553.2685562>
- [70] Mint. 2023. Mint. <https://apps.apple.com/us/app/mint-budget-expense-manager/id300238550>
- [71] Monarch. 2023. Monarch. <https://apps.apple.com/us/app/monarch-personal-finance-app/id1459319842>
- [72] Lunch Money. 2024. Lunch Money. <https://lunchmoney.app/>
- [73] Borke Obada-Obieh, Yue Huang, and Konstantin Beznosov. 2020. The Burden of Ending Online Account Sharing. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20)*. Association for Computing Machinery, New York, NY, USA, 1–13. <https://doi.org/10.1145/3313831.3376632>
- [74] Gary M. Olson and Judith S. Olson. 2000. Distance Matters. *Human-Computer Interaction* 15, 2-3 (Sept. 2000), 139–178. https://doi.org/10.1207/S15327051HCI1523_4
- [75] Jenny G Olson, Scott I Rick, Deborah A Small, and Eli J Finkel. 2023. Common Cents: Bank Account Structure and Couples' Relationship Dynamics. *Journal of Consumer Research* 50, 4 (Dec. 2023), 704–721. <https://doi.org/10.1093/jcr/ucad020>
- [76] Matthew J Page, Joanne E McKenzie, Patrick M Bossuyt, Isabelle Boutron, Tammy C Hoffmann, Cynthia D Mulrow, Larissa Shamseer, Jennifer M Tetzlaff, Elie A Akl, Sue E Brennan, Roger Chou, Julie Glanville, Jeremy M Grimshaw, Asbjørn Hróbjartsson, Manoj M Lalu, Tianjing Li, Elizabeth W Loder, Evan Mayo-Wilson, Steve McDonald, Luke A McGuinness, Lesley A Stewart, James Thomas, Andrea C Tricco, Vivian A Welch, Penny Whiting, and David Moher. 2021. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 372 (2021), 1–10. <https://doi.org/10.1136/bmj.n71> arXiv:<https://www.bmj.com/content/372/bmj.n71.full.pdf>
- [77] Jan Pahl. 1989. *Money and Marriage*. Palgrave Macmillan, Basingstoke.
- [78] Cheul Young Park, Cori Faklaris, Siyan Zhao, Alex Sciuto, Laura Dabbish, and Jason Hong. 2018. Share and Share Alike? An Exploration of Secure Behaviors in Romantic Relationships. In *Fourteenth Symposium on Usable Privacy and Security (SOUPS 2018)*. USENIX Association, Baltimore, MD, 83–102. <https://www.usenix.org/conference/soups2018/presentation/park>
- [79] Joon S. Park, Ravi Sandhu, and Gail-Joon Ahn. 2001. Role-based access control on the web. *ACM Trans. Inf. Syst. Secur.* 4, 1 (Feb. 2001), 37–71. <https://doi.org/10.1145/383775.383777>
- [80] Mark Perry. 2017. Designing interactions with digital money. *Interactions* 24, 6 (Oct. 2017), 34–37. <https://doi.org/10.1145/3143424>
- [81] Mark Perry and Jennifer Ferreira. 2018. Moneywork: Practices of Use and Social Interaction around Digital and Analog Money. *ACM Transactions on Computer-Human Interaction* 24, 6 (Jan. 2018), 41:1–41:32. <https://doi.org/10.1145/3162082>
- [82] Plaid and The Harris Poll. 2021. The FinTech Effect: Fintech's mass adoption moment.
- [83] Plaid and The Harris Poll. 2022. The FinTech Effect: Stability, impact, and building for the future.
- [84] Jennifer Rea, Virginia Zuiker, and Tai Mendenhall. 2016. Money and Emerging Adults: A Glimpse into the Lives of College Couples' Financial Management Practices. *Journal of Financial Therapy* 7, 2 (Dec. 2016), 3. <https://doi.org/10.4148/1944-9771.1110>
- [85] Mintra Ruensuk, Jayeong Yoon, and Choeun Park. 2019. Amor: Supporting Emerging Adult Couples to Manage Finances for a Common Goal. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems (CHI EA '19)*. Association for Computing Machinery, New York, NY, USA, 1–6. <https://doi.org/10.1145/3290607.3309688>
- [86] Neelima Sailaja and Abigail Fowler. 2022. An Exploration of Account Sharing Practices on Media Platforms. In *Proceedings of the 2022 ACM International Conference on Interactive Media Experiences (IMX '22)*. Association for Computing Machinery, New York, NY, USA, 141–150. <https://doi.org/10.1145/3505284.3529974>
- [87] Sesterce. 2023. Sesterce. <https://apps.apple.com/app/sesterce/id1239566667>
- [88] Shareoo. 2023. Shareoo. <https://apps.apple.com/us/app/shareoo-couple-budget-app/id1475406336>
- [89] Supriya Singh, Anuja Cabraal, Catherine Demosthenous, Gunela Astbrink, and Michele Furlong. 2007. Password sharing: implications for security design based on social practice. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '07)*. Association for Computing Machinery, New York, NY, USA, 895–904. <https://doi.org/10.1145/1240624.1240759>
- [90] Linda Skogrand, Alena C. Johnson, Amanda M. Horrocks, and John DeFrain. 2011. Financial Management Practices of Couples with Great Marriages. *Journal of Family and Economic Issues* 32, 1 (March 2011), 27–35. <https://doi.org/10.1007/s10834-010-9195-2>
- [91] Stephen Snow and Dhaval Vyas. 2015. Fixing the Alignment: An Exploration of Budgeting Practices in the Home. In *Proceedings of the 33rd Annual ACM*

- Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '15)*. Association for Computing Machinery, New York, NY, USA, 2271–2276. <https://doi.org/10.1145/2702613.2732808>
- [92] Stephen Snow, Dhaval Vyas, and Margot Brereton. 2017. Sharing, Saving, and Living Well on Less: Supporting Social Connectedness to Mitigate Financial Hardship. *International Journal of Human-Computer Interaction* 33, 5 (May 2017), 345–356. <https://doi.org/10.1080/10447318.2016.1243846> Publisher: Taylor & Francis. eprint: <https://doi.org/10.1080/10447318.2016.1243846>.
- [93] Yunpeng Song, Cori Faklaris, Zhongmin Cai, Jason I. Hong, and Laura Dabbish. 2019. Normal and Easy: Account Sharing Practices in the Workplace. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (Nov. 2019), 83:1–83:25. <https://doi.org/10.1145/3359185>
- [94] Katta Spiel, Fares Kayali, Louise Horvath, Michael Penkler, Sabine Harrer, Miguel Sicart, and Jessica Hammer. 2018. Fitter, Happier, More Productive? The Normative Ontology of Fitness Trackers. In *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems (CHI EA '18)*. Association for Computing Machinery, New York, NY, USA, 1–10. <https://doi.org/10.1145/3170427.3188401>
- [95] Splid. 2023. Splid. <https://apps.apple.com/us/app/splid-split-group-bills/id991473495>
- [96] Splitwise. 2023. Splitwise. <https://apps.apple.com/us/app/splitwise/id458023433>
- [97] Wellcode S.r.l.s. 2024. Balance: Couple Budget & Money. <https://apps.apple.com/us/app/balance-money/id158911117>
- [98] XING YU SU. 2024. Bill Bear. <https://apps.apple.com/us/app/bill-bear/id1517198232>
- [99] Lucy A. Suchman. 1987. *Plans and Situated Actions: The Problem of Human-Machine Communication* (2nd edition ed.). Cambridge University Press, Cambridge.
- [100] Lana Swartz. 2020. *New Money: How Payment Became Social Media* (illustrated edition ed.). Yale University Press, New Haven.
- [101] Tandem. 2023. Tandem. <https://apps.apple.com/us/app/tandem-expense-sharing/id1636705869>
- [102] Spend Together. 2023. Spend Together. <https://apps.apple.com/us/app/spend-together/id1446549608>
- [103] Albert Torno, Oliver Werth, Robert C. Nickerson, Michael H. Breitner, and Jan Muntermann. 2021. More than Mobile Banking – A Taxonomy-based Analysis of Mobile Personal Finance Applications. *PACIS 2021 Proceedings* 1, 1 (July 2021), 111. <https://aiselaisnet.org/pacis2021/179>
- [104] Tricount. 2023. Tricount. <http://apps.apple.com/us/app/tricount-split-group-bills/id349866256>
- [105] Settle Up. 2023. Settle Up. <https://apps.apple.com/us/app/settle-up-group-expenses/id737534985>
- [106] John Vines, Mark Blythe, Paul Dunphy, and Andrew Monk. 2011. Eighty something: banking for the older old. In *Proceedings of the 25th BCS Conference on Human-Computer Interaction* (Newcastle-upon-Tyne, United Kingdom) (BCS-HCI '11). BCS Learning & Development Ltd., Swindon, GBR, 64–73.
- [107] John Vines, Paul Dunphy, Mark Blythe, Stephen Lindsay, Andrew Monk, and Patrick Olivier. 2012. The joy of cheques: trust, paper and eighty somethings. In *Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work (CSCW '12)*. Association for Computing Machinery, New York, NY, USA, 147–156. <https://doi.org/10.1145/2145204.2145229>
- [108] John Vines, Paul Dunphy, and Andrew Monk. 2014. Pay or delay: the role of technology when managing a low income. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14)*. Association for Computing Machinery, New York, NY, USA, 501–510. <https://doi.org/10.1145/2556288.2556961>
- [109] Carolyn Vogler, Michaela Brockmann, and Richard D. Wiggins. 2006. Intimate relationships and changing patterns of money management at the beginning of the twenty-first century1. *The British Journal of Sociology* 57, 3 (2006), 455–482. <https://doi.org/10.1111/j.1468-4446.2006.00120.x> eprint: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1468-4446.2006.00120.x>.
- [110] Dhaval Vyas, Stephen Snow, Paul Roe, and Margot Brereton. 2016. Social Organization of Household Finance: Understanding Artful Financial Systems in the Home. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing (CSCW '16)*. Association for Computing Machinery, New York, NY, USA, 1777–1789. <https://doi.org/10.1145/2818048.2819937>
- [111] Wally. 2023. Wally. <http://apps.apple.com/us/app/wally-smart-personal-finance/id1178011327>
- [112] Weekly. 2023. Weekly. <http://apps.apple.com/us/app/weekly-a-better-budget-app/id1460038809>
- [113] Tong Xia, Yong Li, Jie Feng, Depeng Jin, Qing Zhang, Hengliang Luo, and Qingmin Liao. 2020. DeepApp: Predicting Personalized Smartphone App Usage via Context-Aware Multi-Task Learning. *ACM Trans. Intell. Syst. Technol.* 11, 6 (Oct. 2020), 64:1–64:12. <https://doi.org/10.1145/3408325>
- [114] Group Xpense. 2023. Group Xpense. <https://apps.apple.com/us/app/groupxpense-track-split/id1150902475>
- [115] YNAB. 2023. YNAB. <https://apps.apple.com/us/app/ynab-budgeting-finance/id1010865877>
- [116] Zeta. 2023. Zeta Joint Account. <http://apps.apple.com/us/app/zeta-joint-account/id1493011848>

A Appendix

Application Name		
1Money expense tracker budget	Home Budget	Pennyworth Expense Tracker
Al Salam Equities	Home Budget Tracker & Planner (Previously Shareoo)* ^α	Personal Capital (Empower)
Albert	Honeydue* ^α	Piggy Bank Widget - Savings
Alzex Finance Pro	Household account book	Plenty*
Apple Card Family*	Household accounts - Moneytune	PocketGuard
Aries Trading Simplified	Household Accounts	Privacy.com
Bajaj Broking	Household expenses - Freely	Product Pricing Tool
Balance Couple Budget & Money* ^α	Zeta Joint Account*	Pulse
Banana Split*	Intuit Credit Karma	Qapital*
Banktrack	Investmate	Qube Money*
Beezly Family*	Investors Chronicle	Quickbooks
Betterment	InvestSky*	Quicken Simplifi* ^α
Beyond budget*	Investtech Socks Analysis App	Revolut
BHM Capital Global	iSaveMoneyGo Budget Tracker* ^α	Ria Money Transfer Send Money
Bill Bear* ^α	Ivella*	Rocket Money
Bill Magic* ^α	Ivy Wallet money manager	Royal London
Bills Monitor - Bill Reminder	KOHO	Saldo* ^α
blinkX Stocks & Demat Account	Living Cost for Two - FamiCost	Sarwa Invest, Trade & Save
Buddy Budget Planner*	Luna*	Savings Goal
Budget App - Spending Tracker* ^α	Lunch Money* ^α	Sesterce - split expense * ^α
Budget Planner & Manager Monee* ^α	LXME Learn, Invest, Borrow	Settle Up - Group Expenses* ^α
Budget planner—Expense tracker	Meow Money Manager - Cute Cat	Sharemoney Money Transfers
Budget expenses and income	Mint	Smart Finance & Budget
Buxfer	Mirae Asset Fin Loans	Smoov Finance* ^α
Cash / Wallet Management	Mo Trader	Spend Together* ^α
Cash App	Monarch Money* ^α	Spendee
Cashew—Expense Budget Tracker	Moneyfy Money Tracker	Spending Log Pro
Centsible	Money - Your Financial Planner	Spending Tracker
Chapa Merchant	Money Calendar	Spending Tracker - Money Flow
Chronical (Free)	Money Lover	Splid - Split group bills* ^α
Chronical Pro	Money Manager Bills & Budget	Split Money* ^α
Cingo App* ^α	Money manager & expenses	Splittr* ^α
Cleo	Money Manager Expense & Budget (free)	Splitwise* ^α
CloudSpouse	Money Manager Expense & Budget (paid)	Stake
Color Money*	Money Mitra	Startrader Online trading app
CommonCard*	Money Note	Stash
Copilot money	Money Tracker Expense Tracker	Stock market news tracker
Cost Track your Money Tracker	Money Tracker Expense Manager	StockLight NASDAQ...
CountAbout	Moneyboard Budget Planner Bill	Tango
Crush*	Moneydashboard	The Economic Times
Daily Expense Tracker - MonAI*	MoneyLion Bank & Earn Rewards	The Knot
DAILY POCKET - Budget Manager	MoneySpaces* ^α	Tandem* ^α
Debit & Credit	MoneyThings - Finance Tracker*	Tiller Money
Dhan stock market trading app	Mony Budget & Expense Tracker	Today's Budget Money Tracker*
Dollarbird*	Monzo*	TrackWallet Expense Tracker
EarnIn	Moolahmate	Tricount* ^α
Easy Business Case Calculator	Motilal Oswal Demat Stocks IPO	Twine
EasyBudget - Budget planning*	My Budget - Expense tracker	UnityPay Household Budget *
Etrade	My Home Bills - Home box	Vena Solutions
EveryDollar Personal Budget	MyBambu	Venmo*
Expenses* ^α	MyMoney Pro - Expense & Budget	Vital Card *
Fidelity Investment	MyMoney—Track Expense & Budget	Wallet by Budget bakers
Financial Ratios Go	Nanny Paycheck Calculator	Wally* ^α
Financial Times	Neck money planner budget app	Weekly
Firstly (Previously HoneyFi)	NerdWallet	Western Union Send Money Now
Flatastic - Manage your home* ^α	Nest Payroll	WhatisUWE App
Float	Oh My Money (Account book)	Wise (previously transferwise)
Flow Net Worth Wealthy	OneMain (Trim)	Yahoo Finance
Fold - Savings, Budget Tracker	Oportun	YNAB* ^α
Fudget	Our Expenses Household budget (previously Expenses)* ^α	Zelle
Goodbudget Budget Planner	OurFlat Household & Chores* ^α	
Group Xpense* ^α	Paypal	

Table 4: Financial applications identified with the search strategies. Among the list, * are applications where an audit was attempted, as they (i) were available for download or usage in the US, (ii) were operational, (iii) were advertised as for financial sharing in a social setting. ^α are applications where a user journey audited was successfully completed. Application taglines and/or claims have been omitted for better readability. [^] were applications that were successfully audited with user journey audit.

Application name	Android download #	iOS download #
Apple Card Family	-	
Balance: Couple Budget & Money		5K+
Banana Split	10K+	50K+
Bill Bear		5K+
Bill Magic	-	
Buddy	-	500K+
Budget App - Spending Tracker		5K+
Budget Planner & Manager Monee		10K+
Buxfer	10K+	10K+
Centsible	100+	100+
Cingo App	100+	
CloudSpouse	-	100+
CommonCard	-	100+
Dollarbird	50K+	100K+
Every Dollar	1M+	5M+
Expenses	-	
Flatastic	500K+	1K+
Goodbudget	1M+	1M+
GroupXpense	100K+	5K+
HoneyDue	100K+	500K+
Home Budget Tracker & Planner	50K+	
Ivella	-	10K+
iSaveMoneyGo: Budget Tracker	100K+	
Luna	10+	1K+
Lunch Money	-	-
Mint	10M+	50M+
Monarch	10K+	100K+
Moneyfy	5M+	100K+
Moneyfy Pro	100K+	100K+
Money Spaces	100K+	
Our Expenses: Household budget	10K+	
OurFlat: Household & Chores	100K+	
Privacy.com	100K+	500K+
Qapital	500K+	500K+
Qube Money	10K+	50K+
Quicken	500K+	1M+
Quicken Simplifi	5M+	
Rocket Money	Not available	5M+
Saldo	1K+	5K+
Sesterce	10K+	1K+
Settle Up	1M+	50K+
Shareroo	-	5K+
Smoov Finance	10K+	
Spend Together	-	10K+
Splid	1M+	100K+
Split Money	50K+	
Splitrr	100K+	10K+
Splitwise	10M+	1M+
Tandem	-	2M+
Tricount	5M+	100K+
Venmo	10M+	10B+
Wally	5K+	10K+
Weekly	-	50K+
YNAB (You need a budget)	1M+	1M+
Zeta	50K+	1M+

Table 5: Audited apps' download number, segmented by platforms. Android download numbers are recorded from the Google Play Store app listings and are represented in tiers. The App Store download numbers are approximated, as they were not readily provided by Apple. The approximated numbers are then mapped to tiers similar to the Android one for easier comparison.

Application Name	Sharing Location				Sharing Method		
	Onboarding	Profile/Account	Menu	Create	Link/URL	QR	Code
Balance: Couple Budget & Money			⊗		⊗		⊗
Beezly Family					⊗		
Bill Bear			⊗		⊗	⊗	⊗
Budget App - Spending Tracker			⊗	⊗		⊗	⊗
Budget Planner & Manager Monee	⊗				⊗	⊗	⊗
Crush					⊗		
Cingo App		⊗		⊗	⊗		
Color Money						⊗	⊗
Easy Budget		⊗			⊗		
iSaveMoneyGo: Budget Tracker				⊗	⊗		
Lunch Money					⊗		
MoneySpaces			⊗	⊗			
Monzo	⊗	⊗			⊗		
OurFlat: Household & Chores	⊗	⊗	⊗	⊗			⊗
Plenty	⊗				⊗		
Smoov Finance					⊗		
Split Money		⊗		⊗			
Today's Budget			⊗		⊗		
Today's Budget Money Tracker	⊗			⊗			
UnityPay: Household Budget	⊗				⊗		⊗
Venmo		⊗	⊗	⊗			
Wallet by Budget Bakers			⊗	⊗	⊗		

Table 6: Mapping of abstract location whereby financial sharing took place on the applications under review. ‘Create’ refers to the creation of the shared financial instrument (e.g., bill, space). The mechanism of Link/URL were the most common method of sharing, that could either be sent via an SMS message, email, or push notification. Code required the manual entry of a unique alphanumeric string of characters.

Application name	Origin	Relationship	Authority	Dynamic
Balance: Couple Budget & Money	Application-only	Single user	Collaborator	At-will
Bill Bear	Application-only	Multiple groups	Coordinator	At-will
Bill Magic	Application-only	Multiple groups	Collaborator	At-will
Budget App - Spending Tracker	Application-only	Multiple groups	None	At-will
Budget Planner & Manager Monee	Application-only	Single group	Collaborator	At-will
Cingo App	Application-only	Multiple Singles	Broadcaster	At-will
CloudSpouse	Hybrid	Single user	None	At-will
Expenses	Application-only	Single user	Collaborator	At-will
Flatastic - Manage your home	Application-only	Single group	Creator	At-will
Group Xpense	Application-only	Multiple groups	Broadcaster	At-will
Home Budget Tracker & Planner (Previously Shareoo)	Application-only	Single group	Collaborator	Enduring
Honeydue	Hybrid	Single user	Collaborator	At-will
iSaveMoneyGo: Budget Tracker	Application-only	Multiple Singles	Coordinator	At-will
Lunch Money	Hybrid	Single group	Coordinator	At-will
Monarch Money	Hybrid	Single group	Coordinator	At-will
MoneySpaces	Application-only	Single group	Coordinator	At-will
Our Expenses: Household budget (previously expenses)	Application-only	Single user	Collaborator	Enduring
OurFlat: Household & Chores	Application-only	Single group	Coordinator	At-will
Quicken Simplifi	Hybrid	Single group	Coordinator	At-will
Saldo	Hybrid	Single group	Coordinator	At-will
Sesterce - split expense	Application-only	Multiple groups	Collaborator	At-will
Settle Up - Group Expenses	Application-only	Multiple groups	Coordinator	At-will
Smoov Finance	Hybrid	Single user	Collaborator	Enduring
Spend Together	Application-only	Multiple groups	Coordinator	At-will
Splid - Split group bills	Application-only	Multiple groups	Collaborator	At-will
Split Money	Application-only	Multiple groups	Creator	At-will
Splittr	Application-only	Multiple groups	Collaborator	At-will
Splitwise	Application-only	Multiple groups	Collaborator	At-will
Tandem	Hybrid	Single user	Creator	At-will
Tricount	Application-only	Multiple groups	Collaborator	At-will
Wally	Hybrid	Multiple groups	Coordinator	At-will
YNAB	Hybrid	Single group	None	At-will

Table 7: Frequency table tallying how each application maps to the four sharing dimensions.

Origin	Count	Applications
Application-only	31	Balance: Couple Budget & Money, Banana Split, Beezly Family, Beyond budget, Bill Bear, Bill Magic, Budget App - Spending Tracker, Budget Planner & Manager Monee, Cingo App, Daily Expense Tracker - MonAI, Dollarbird, Expenses, Flatastic - Manage your home, Group Xpense, Home Budget Tracker & Planner (Previously Shareoo), iSaveMoneyGo: Budget Tracker, Moneydashboard, MoneySpaces, Neck: money planner budget app, Our Expenses: Household budget (previously expenses), OurFlat: Household & Chores, Venmo, Qapital, Sesterce - split expense , Settle Up - Group Expenses, Spend Together, Splid - Split group bills, Split Money, Splitrr, Splitwise, UnityPay: Household Budget
Financial-instrument only	20	Buxfer, Copilot money, Debit & Credit, Etrade, EveryDollar: Personal Budget, Fidelity Investment , Goodbudget Budget Planner, Mint, Money Lover, Moolahmate, NerdWallet, Oportun, PocketGuard, Qube Money, Revolut, Rocket Money, Sarwa: Invest, Trade & Save, Spendee, Tiller Money, Wallet by Budget bakers
Hybrid	24	Apple Card Family, Buddy: Budget Planner, CloudSpouse, CommonCard, Crush, EasyBudget - Budget planning, Firstly (Previously HoneyFi), Honeydue, Zeta Joint Account, Ivella, Luna, Lunch Money, Monarch Money, Monzo, Plenty, Quicken Simplifi, Saldo, Smoov Finance, Tango, Tandem, Twine, Wally, Weekly, YNAB
Offline	12	1Money: expense tracker budget, Alzex Finance Pro, Centsible, Chronical (Free), Chronical Pro, Cost Track: your Money Tracker, EveryDollar: Personal Budget, Goodbudget Budget Planner, Monefy: Money Tracker, Money Tracker: Expense Manager, Pennyworth: Expense Tracker, Weekly

Table 8: Frequency table summarizing the occurrence of each Origin sub-dimension in applications we sourced. Note that application where shared data originates from financial instrument-only or offline were not audited, as sharing is not explicitly supported in these applications and thus do not meet our audit criteria (see Figure 2).

	Add	Edit	View	Share	Delete	Archive	Hide	Leave
Space	13	4	4	4	5	3	1	17
Member	31	-	31	-	19	-	-	1
Entry	31	31	31	6	25	1	2	-

Table 9: Matrix of financial service mapped against financial privilege as modeled via number of apps (N) in the user journey audit. Space refers to a domain where entries located in it are shared amongst members, Member are users who are participating in sharing, Entry is a shared data object. - indicates this action is invalid.