

Expense Sharing App Prototype: Usability Testing



User Centered Design

Step 1: Market & Competitive Analysis

The use of mobile payment systems are increasing, and millennials are comfortable with mobile payments due to perceived security, convenience, and portability. Additionally, many participate in a variety of expenses-sharing activities such as social events, trips/event planning, and reoccurring living situations (splitting internet and electricity bills with a roommate, etc.). I then did a competitive analysis of the most popular expense-sharing apps on the market:

Money Splitting Apps: Competitive Analysis					
<i>Introduction: while looking through related apps, I found many one-off apps in the Apple store. A few were specialized like RentShare, IOU, & Splittr. Many were new with little to no reviews, and some were premium apps that required purchase. I didn't consider more specialized money splitting functions like those found in Uber and Lyft, where you can split the bill of a ride share by paying a small fee.</i>			Rubric Criteria		<i>Conclusion: saw some differences between larger, broad money transfer apps and smaller niche apps. Looking for app that can: 1) transfer money in-app, 2) easily split cost in-app, 3) let users organize expenses, and 4) have the ability to subtract expenses owed from owe</i>
			1 - Poor		
			2 - Average		
			3 - Excellent		
Company	Venmo	Splitwise	Cash	Divvy	Snapcash
General Overview	Venmo is a free money transfer app that lets users connect their social networks to transfer money quickly and easily. They are provided by Paypal, which also owns money services like Xoom.	Splitwise helps split bills with friends by inviting users on the platform. Its group function allows ease of splitting bills, travel expenses, etc., with a broad overview.	Cash (by Square) has a simple interface whose primary function is to send and receive cash. Contacts can be notified through SMS, email, and the app's own tags.	Divvy is a premium app that splits printed restaurant checks through text recognition image software, where users can organize and add tips.	Snapcash is a cash messaging function on the popular Snapchat platform. It allows users to link debit accounts and send money inline to friends.
Organization make groups/events, categorize	1 - no ability to organize groups or types of payment, can only view history of transactions.	2 - can create groups in categories "apartment", "house", "trip", or "other".	1 - no ability to organize transactions, can only view past activities.	1 - app is designed for one-time use with every check, specialized for restaurant receipts.	1 - no ability to organize transactions, can only view ledger of past activity per account.
Money Transfer Ability to transfer money within the app	Yes	No	Yes	No	Yes
Versatility Link friends, nearby people, accounts	3 - Can sync with FB, contacts, nearby people, and accepts credit cards & bank accounts.	2 - Can invite people through email & phone.	2 - Can invite people through sms, email, and search tags/ids.	1 - Users don't interact with each other in-app.	1 - based on Snapchat contacts, confined within social platform.
Control notify other users, view pending transactions, ability to cancel & report spam	3 - Can remind users of pending transactions, can cancel and view current amounts owed/owe.	2 - Can view running totals, ability to edit transactions.	2 - Can cancel and view amounts owed/owe with relevant notes.	1- Calculation control for splitting physical bills, all other elements not applicable.	1 - has a warning for pending money sent, then no other changes allowed afterwards (not many choices for users).
Usability overall design, navigation, function	2 - Clean & simple design, easy to navigate, requires some digging in the menus for info	2 - Overall intuitively organized with clear instructions/onboarding.	3 - simple navigation, clean design, primary functions in hierarchy.	1 - intuitive but cluttered and clunky design, cumbersome.	2 - very simple setup, use \$ tag in chat to send money, straight-forward.
Unique Points of Interest strength in app design different from competitors	The most popular app, has been integrated in real-world point-of-sales through paypal affiliated merchants	Can organize by groups/function, has the ability to attach pictures and export as spreadsheet.	Bold, clean UI/UX offering the simplest way to send money from one person to the next.	Text-in-image recognition lets user organize items by taking a picture of a physical bill, has calculation functions.	Add-on feature to Snapchat, but has social/gamified network not found elsewhere.

Step 2: Heuristic Analysis

Upon learning a few different sets of best practices to build a digital interface, I used the Forrester Research Website Brand Action scorecard, a heuristics tool focused on the usability of a product interface. I reviewed the most popular product in my competitive analysis (Venmo) for comparison.

Evaluated user goals

1. Securely transfer money from one individual to another
2. Organize and sort through transactions
3. Personalize experience according to user money transfer needs

1. Is the content required to support the specified user goals available where needed?

Pass

Venmo does a clean, step-by-step walkthrough on creating an account and linking the proper information/contacts before it can be used effectively. It promises secure and free money transfer for its users with a simple onboarding process. There are three tabs available for categorizing/viewing past transactions – public view, friend view (based on your linked contacts), and personal view. Content can be pulled from different social media accounts/contact lists according to user needs. Overall there are limitations to how the experience can be organized and personalized (lack of content supporting more nuanced functionality).

2. Is the functionality required to support specified user goals available where needed?

Pass

Similar to above score and reasoning, though Venmo is limited in its organization and personalization functionalities, the functions it supports are very well done within the application's current scope. The complex and secure processes happen below a clean and simple interface, ultimately delivering its value as a secure and free money transfer app.

3. Are menu category and subcategory names clear and mutually exclusive?

Pass

Side navigation menu is ordered (chronologically grouped) from the top down. The home link is on the top, followed by three links for adding people to charge/give money to (searching by account name, scanning a code in person, and inviting friends through social networks, mutually exhaustive search processes), then four links for managing money (transfer to bank, merchant purchases, notifications, and incomplete charges) and finally help and settings links. Overall this menu is clearly named, but does not follow a mutually exclusive, categorical order (actions serve mixed purposes). Top menu icons show public transactions, friends' transactions, and your own transactions – not mutually exclusive. Pay or request button (most important function) is well organized and options on the page are mutually exclusive.

4. Does site content use language that's easy to understand?

Strong Pass

Overall language is clean and simple to understand – buttons are not ambiguously labeled or cluttered. Menu items are explained in short sentences and help/FAQ section is precise and forward.

5. Does the site use graphics, icons, and symbols that are easy to understand?

Fall

Graphics are clean and easy to understand. In the "settings" section, "connected merchants" under the buying functionality and "legal" and "helpful" under the information functionality share the same icon (a document icon) which may lead to some visual confusion. "Purchase" icon on left side menu does not look like a receipt printer at first glance (which is its intention). Top icons for sorting transactions are somewhat confusing. (A netted circle signifies the "public web"—unsure how this adds to user experience)

6. Is text legible?

Pass

Text is all presented in consistent san-serif font with comfortable white space between the lines. No options for increasing text size or other assistance is available native to the app.

7. Are interactive elements easily recognizable?

Pass

Interactive elements are icon and button driven, though there are slight inconsistencies in the way they are presented (placing words next to some icons on one menu but not on others, different effects when highlighting a menu item in action, etc.)

8. Does the site perform well?

Strong Pass

Site searches users in a variety of ways, allows users to charge/send the money once another account is found, and lets users view/manage transactions effectively.

Step 3: Contextual Interviews

I created an outline for a contextual interview and conducted a few with sample users. Limited time and resources constrained the sample size/quality and the methodologies used, but I was able to take away a few key findings and recommendations.

INTRODUCTION

Establish rapport

Purpose of interview: - background -> research -> topic-> permission to record/observe

Confidentiality & anonymity

Format - process walk-through

Role: note-taker, user researcher

(Demographic: expense sharing process = college-age students)

Ask about interviewee's overall background related to cost sharing process

Natural process - try not to feel scripted!

Observe body language with words

Lead into questions/be flexible and adapt to different conversation directions

AREAS OF FOCUS

How often do you expense sharing tools?

What factors play a role in you deciding to share an expense in the first place?

What are some situations where you typically share expenses with others?

How do you communicate when sharing expenses?

Tell me about the most recent time you had to share a cost with a friend.
Take me through your [expense sharing] process.
What patterns do you notice in your expense sharing behavior?
What tools do you use for this process?
What do you find most helpful?
What concerns do you have?
Are there any difficult or easy parts in this process?
Do you mind if I ask you some questions as you walk through the process?
Can you show me how you begin splitting bills with your [roommates]?

CONCLUSION

Preface section: reflecting what I've seen, please correct me if I'm wrong...
Review observations/user conclusions
Reason why user took specific action(s)
Clear up misconceptions
Emphasize important points
Thank interviewee - for time and participation

INTERVIEW FINDINGS SUMMARY

CONTEXT

7 users interviewed: 5 females, 2 male, age 20-23, college students. Locations/situations: 1) coffee shop - vacation planning, 2) restaurant - group bill splitting, 3) apartment - monthly bills with roommates, and 4) general location(s).

OBJECTIVES

To better understand the reasons why people share expenses
To better understand situations in which expense-sharing arise
To carefully observe current expense-sharing behavior(s)
To learn fears and concerns surrounding current expense-sharing tools
To focus on expectations of users when sharing expenses

FINDINGS

An overwhelming majority of interviewees (6/7) rely solely on Venmo as their current expense-sharing tool. (The other person relies on his bank's Quick-Pay tool for added security/insurance, but notes that the service has difficulty transferring money to smaller and regional banks). Overall, the top situations why users shared expenses were because of: 1) shared purchases on trips/vacations, 2) monthly recurring charges between roommates/housemates (like electricity and internet bills), and 3) shared miscellaneous activities in the area that the user lives, for example: a) pooling in money for party supplies, b) splitting a bill at a restaurant, and c) sending money to a contact who is buying a product on the user's behalf. The top reasons cited for using expense sharing tools were: 1) ease of use, 2) mobility, 3) immediate/fast payment, and 4) keeping track of past transactions. The top concerns that users had were: 1) paying the correct amount to the correct person, 2) transferring/withdrawing money without any errors, 3) security, and 4) not over-drawing linked bank accounts.

Some notable patterns during observations/discussions were: 1) interactions seemed to be socially and geographically based. Users charged/sent money to recurring people (interacted with them most often), and gained new contacts on trips. Purchases varied by location (larger entertainment/transportation purchases during travel; smaller recurring purchases near home; more

frequent use in the city versus rural areas). 2) people often switched charge/send roles to their advantage - for example getting an exclusive discount/deal on a purchase, reserving an activity under a specific user, or using a cash-back category on a user's credit card. 3) most Venmo users kept money in the app for convenience in paying others, and only transferred money to their banks when a) they accumulated a large balance and/or b) their monthly bills were settled. 4) The most users expressed interest in being able to better categorize/group past transactions. 5) Most venmo users stated they did not use the social function of the app, where you can view public and friend transactions.

RECOMMENDATIONS: improve user's ability to categorize/group transactions, improve security and warning features, and remove unnecessary features.

Step 4: User Personas

The next step was to develop user personas, generalizing the target demographic while expressing understanding and empathy for the users. This helped me visualize the users for the app and develop solutions based on their needs/goals:

Jason Hall Persona

Ying Liang



Demographics

Age	22
Gender	Male
Location	Columbus, OH
Occupation	Full-time Student
Income	Entry-level (\$65,000)
Education level	College

Jason is an undergraduate at Ohio State completing his fall semester as a senior. He majored in accounting and data analytics. Since he already accepted a job offer with PwC, which starts in 10 months, he's not worried about networking and job-hunting like his peers. He'd rather spend time relaxing. One of his favorite things to do is travel. He has money saved up, and wants to vacation with his friends during spring and summer breaks. Since he and his friends often pool money together for purchases while traveling, he wants a convenient and secure expense-sharing tool.

Personality

Introvert ————— ● Extrovert
Analytical ● ————— Creative
Passive ————— ● Active

Media Channels

Mobile: Apple iOS
Safari Browser
Fortune, WJS
Email Newsletters

Priorities

1. Security
2. Convenience
3. Accuracy
4. Speed
5. Price

CHALLENGES: (1) Feeling secure about linking bank accounts and credit card information, (2) Overall transparency - trust of an expense-sharing tool, (3) Worried about getting the correct amount to the correct person

GOALS: (1) Seamless mobile experience - troubleshooting on-the-go, (2) Easily and quickly share payments between friends on trips, (3) Have a ledger - careful record of expenses as reference

Maria Davis Persona

Ying Liang



Demographics

Age	24
Gender	Female
Location	Miami, FL
Occupation	Nurse Technician
Income	Entry-level (\$29,000)
Education level	College

Maria completed Miami-Dade's nursing program and works as a nurse technician at a local hospital. Through budgeting, she was able to save and rent a nice apartment with a roommate, who splits electricity/internet bills. Now she feels secure with a stable job, and is more generous with her time and spending. She loves to hang out with her friends and often gets together with them to watch movies, shop, eat at local restaurants, and go to the beach. She doesn't like to carry cash and will often shares expenses with her friends while they are together, hunting for the best deals and promotions.

Personality

Introvert —●———— Extrovert
Analytical —————●—— Creative
Passive —————●—— Active

Media Channels

Mobile: Android
PC: Chrome, Email
Youtube

Priorities


1. Convenience
2. Price
3. Security
4. Accuracy
5. Speed

CHALLENGES: (1) Having a backup plan - worry about overdrawing, having finances in order, (2) Staying within budget, being able to analyze & organize past transactions, (3) Keeping social relevance - in spending, keeping track of multiple things at once

GOALS: (1) Easily and quickly share payments between recurring friends, (2) Easily maintain and transfer a balance in an expense-sharing tool, (3) Ease of use - centralized expense location

Step 5: Card Sort

In thinking about the content, features, and functionality of the product, I came up with 25 items for users to choose from. Using OptimalWorkshop, I made an open card sorting exercise to gather feedback for how to effectively group user functionalities within the app. (Group names were suggested but participants were also free to make their own titles and sections). Below are screenshots of the card sort, from the intro survey to the instructions/category, and an example card sort. Due to time and resource limitations, student groups were preassigned to participate in our card sorting exercises.



Link Credit Card

Link Bank Account

Help

Change Email Address

Send Reminder

Report a Problem

View Recent/Top People

View Past Transactions by Type

Add Profile Picture

Create New Event

Transfer Money to Bank

Search by User ID

View Past Transactions by Groups

Create New Group

Decline Payment

Settings

Cancel Payment

Calculator Tool: Split Bills & Tip Generator

View Past Transactions by High to Low

Link Social Media Account

25 of 25 remaining

Take a quick look at the list of items to the left. Please sort them into groups that make sense to you.

There are 4 primary categories: 1) administrative (account, help, etc) 2) view log (old transactions), 3) view current (pending transactions) and 4) send/receive money. Please name these categories in a way that makes sense to you, or do something different if it comes more naturally.

Drag an item from the left into this area to create your first group.

Before we begin

Please answer the following questions

What current expense sharing tool do you use, if any?

☐ Venmo

☐ Paypal

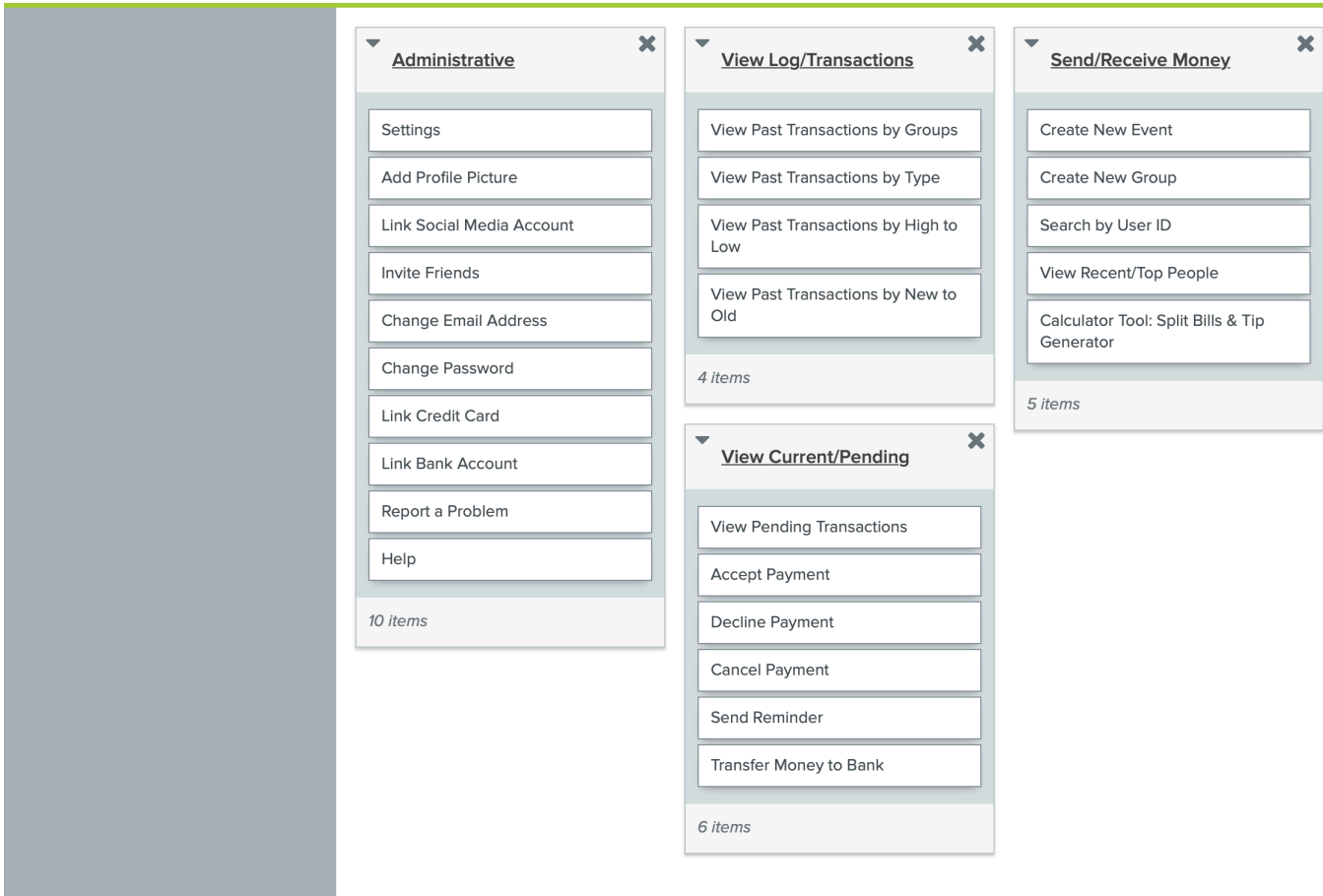
☐ Other

In a few words, what do you like best about the tool?

What do you think needs improvement?

Continue

* indicates required fields

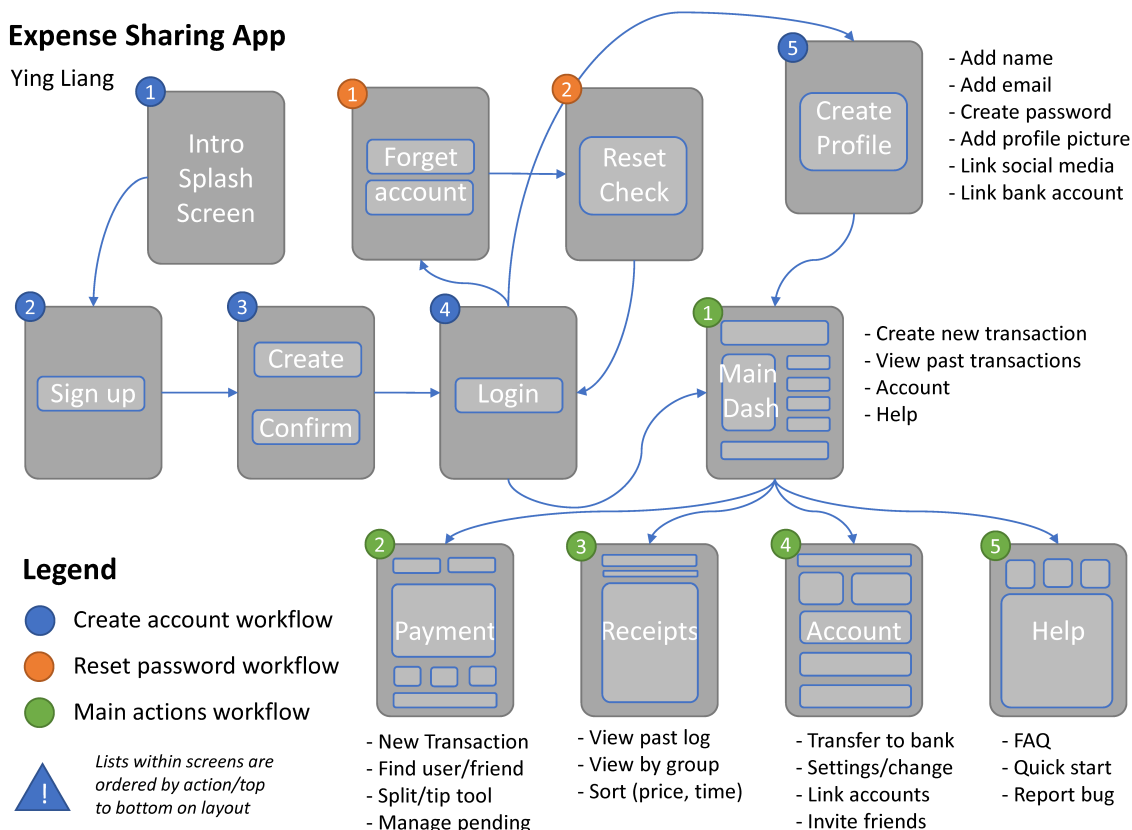


Step 6: Site Map

Taking the card sort feedback into consideration, I created a site map for the app interface:

Expense Sharing App

Ying Liang



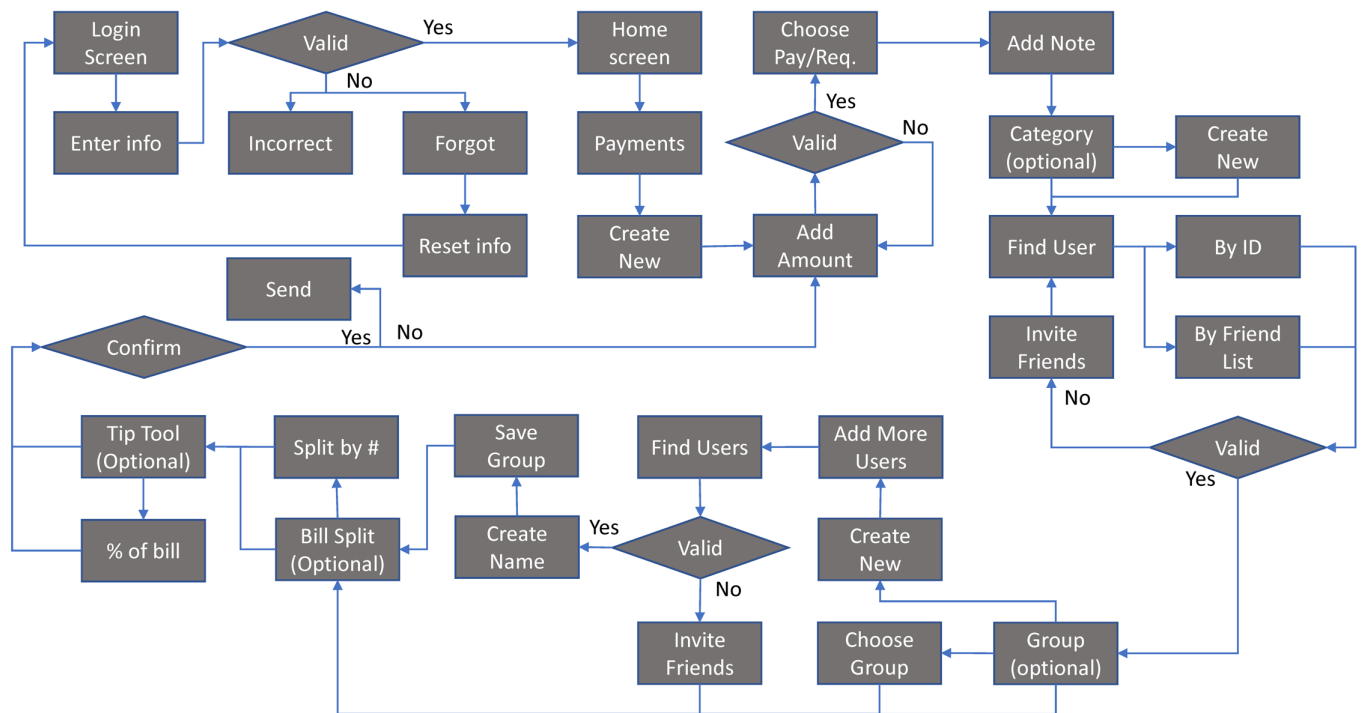
The pre- and post- survey question I created were helpful because they gave me context to which a user approached my card sort. Two thirds used Venmo, and cited the ease of use and convenience as their favorite elements, while stating glitches, security, and past transactions (currently unorganized) were areas for improvement. Everyone stated they understood the task so I'm confident in the result.

I considered this as well as the actual card sort itself. I was surprised by a few things ("invite friends" & "transfer to bank" sorted in areas I didn't expect, my recommended categories in the instructions mostly ignored). But everything else was as expected. I'm unsure what to name the "receipts" section but that functional category was consistently there. Though I'm still deciding layouts, these are rough guidelines based on the functionality groups of each page, which again was determined largely through the card sort.

Step 7: Task Flows

At this point, a task flow would be a helpful visual depiction of how a user completes a task. Creating this flow helped me think through all the actions a user must take:

Expense Share Task Flow: Creating New Transaction (Using Groups)



Step 8: Tree Tests

The next step was an exercise that tested whether or not the navigation was easy to understand. Using Optimal Workshop again, I created a tree test with the sections/sub-headers previously defined by the card sort exercise. I created three tasks for the users to complete: 1) creating a category for a new payment, 2) linking a new credit card to your account, and 3) sorting past transactions by group. These were important user functions that spanned the different features available within the app. Left to right: 1) tasks with correct answers, 2) full menu for participants to pick from, 3) screenshot examples of participant's task pick.

Tasks

1

How would you specify a category for a new payment?

Payments > Create New > Add a Category

Define correct answers

2

Where would you go to link a new credit card to your account?

Account > Link New Credit Card

Define correct answers

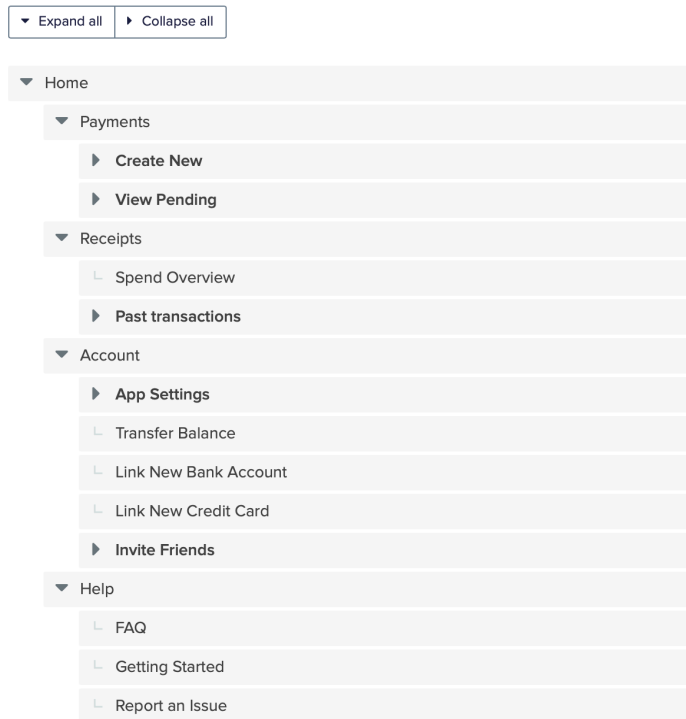
3

Where would you go to sort past transactions by groups?

Receipts > Past transactions > Sort by group

Define correct answers

Tree ?



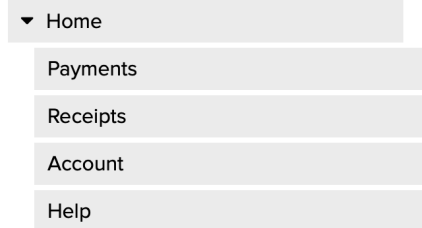
Task 1 of 3

How would you specify a category for a new payment?

Start task

Task 1 of 3

How would you specify a category for a new payment?

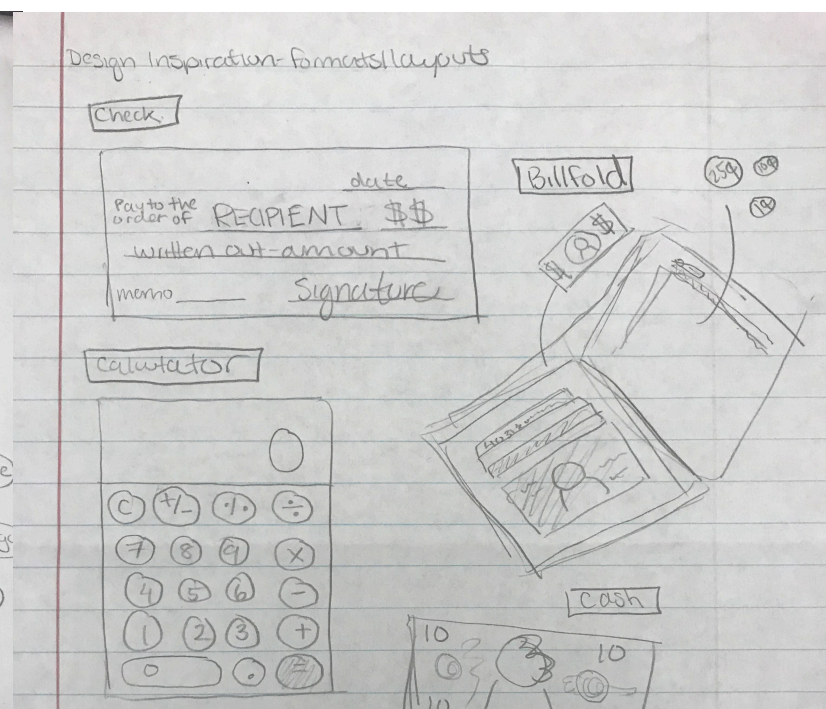
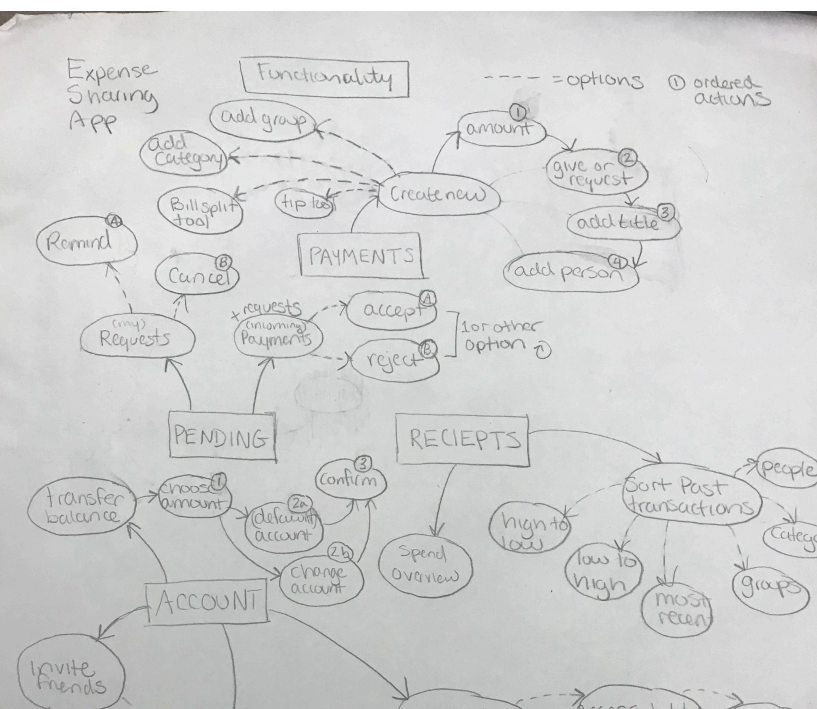
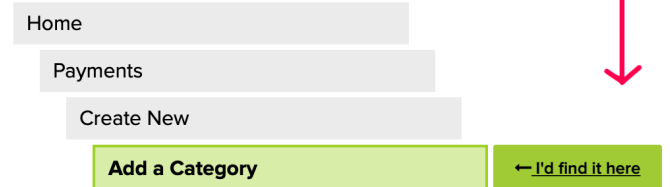


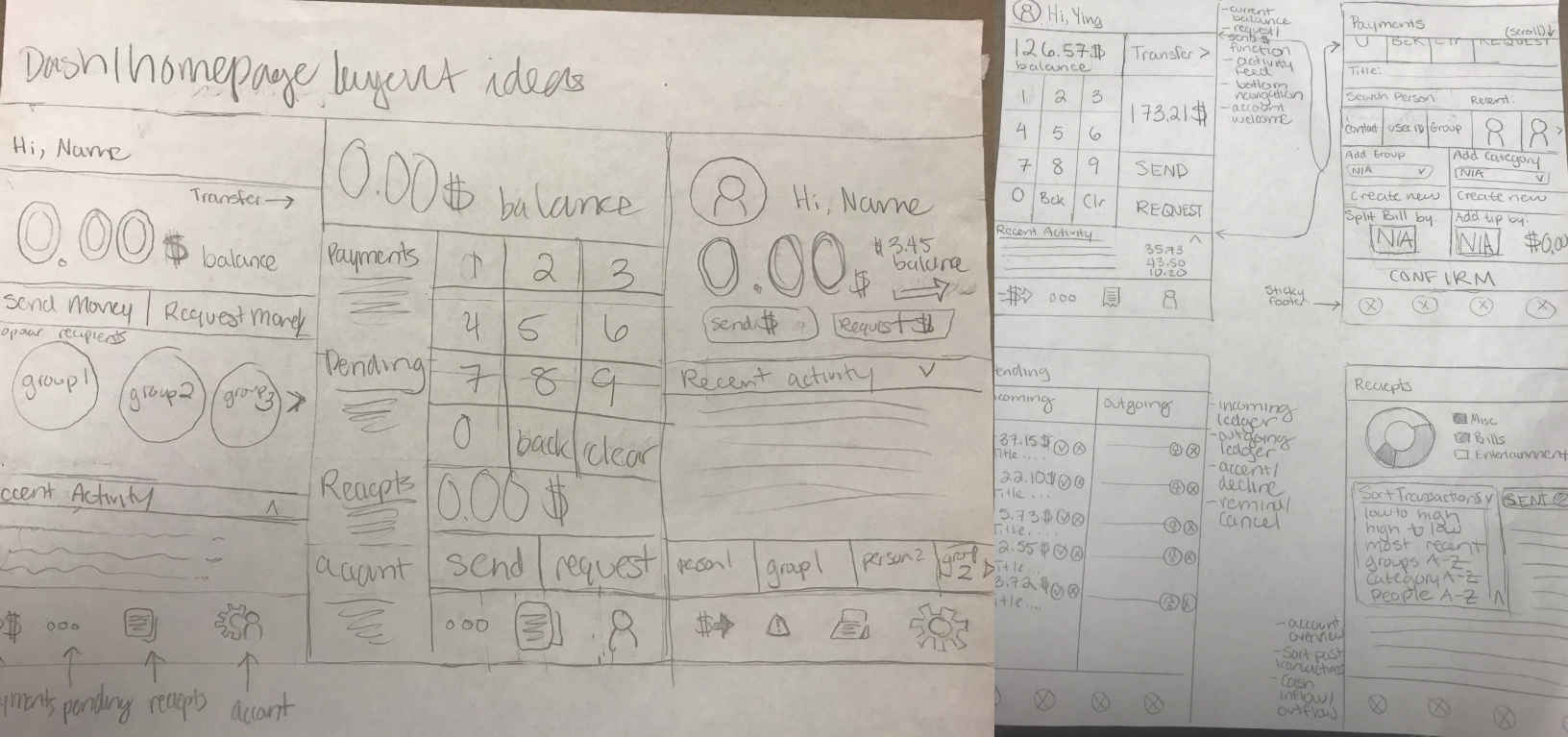
Step 9: Interface Sketches & Wireframes

After completing the tree test, I began brainstorming and sketching out different ideas for the app interface. I mapped out user actions for easier visualization, sketched design inspiration from different money-related interfaces/devices and created different drafts of the main app sections.

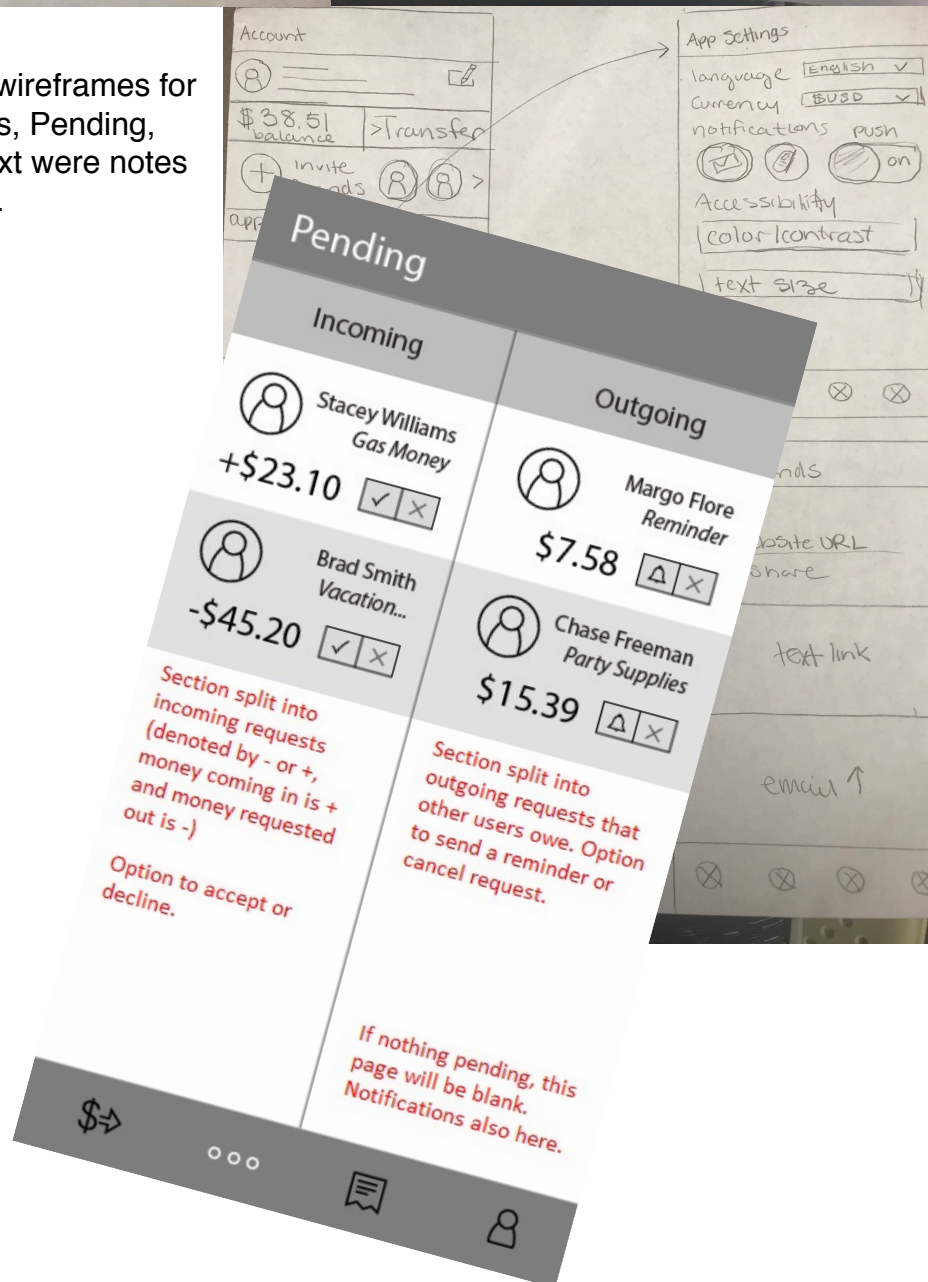
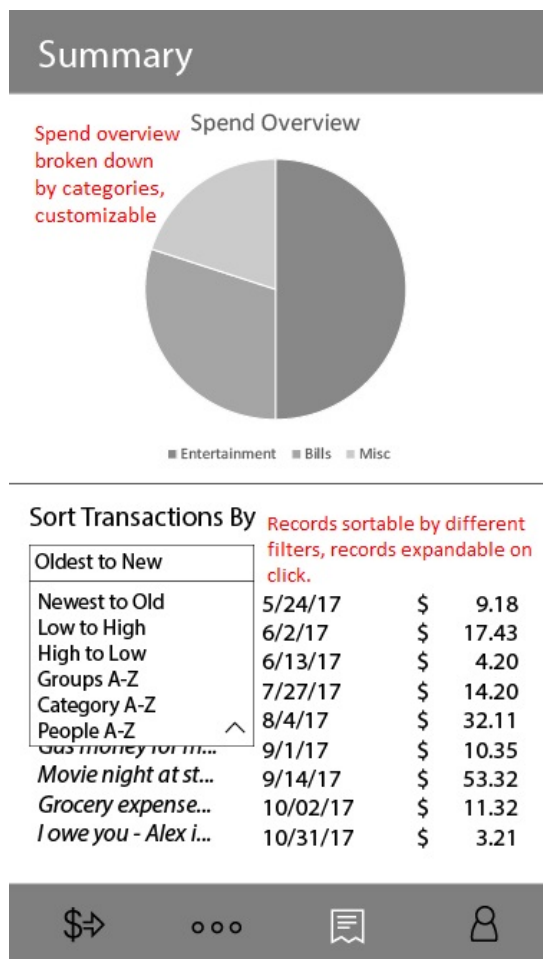
Task 1 of 3

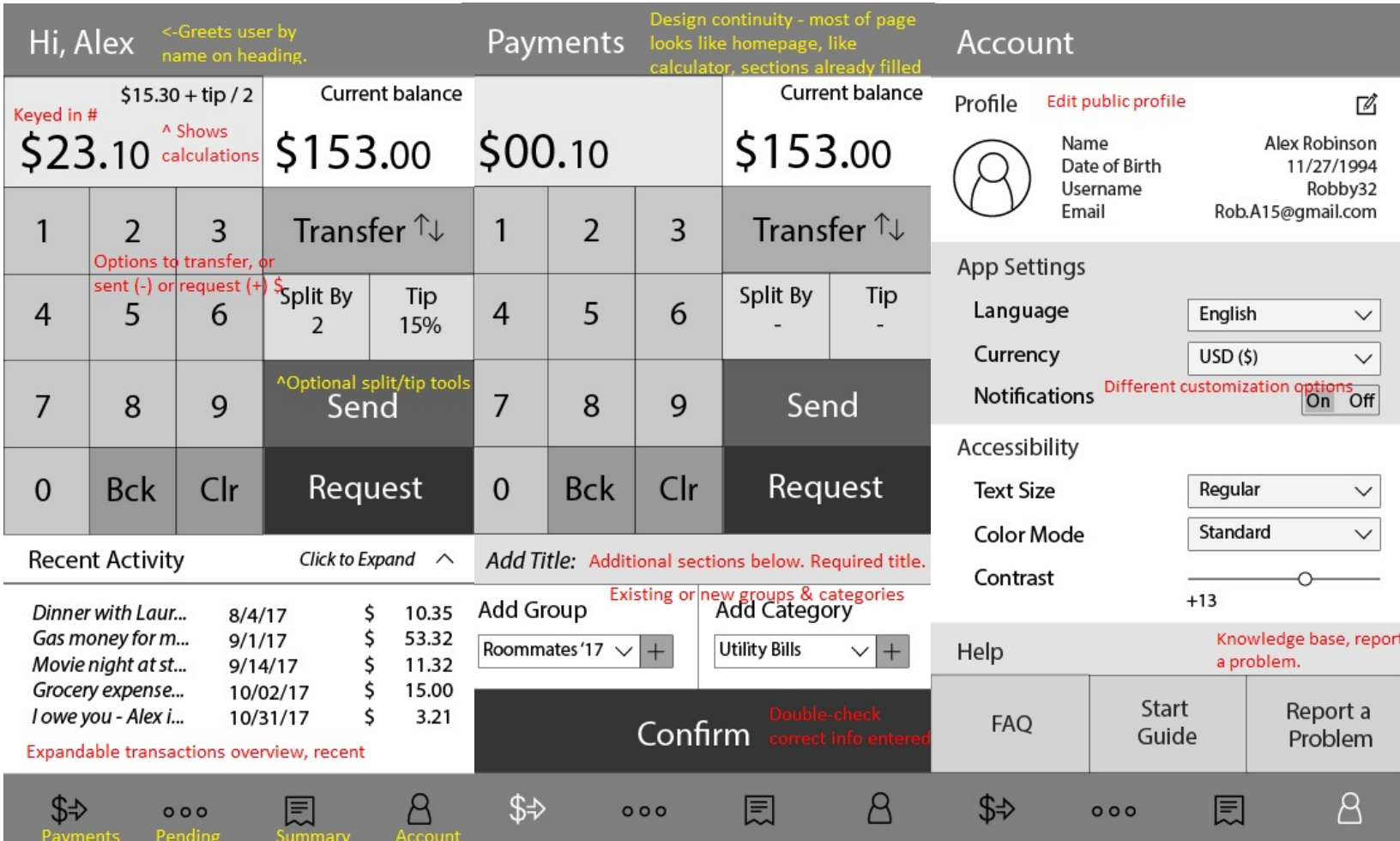
How would you specify a category for a new payment?





I then cleaned up the sections by creating wireframes for the main screen sections: Home, Payments, Pending, Summary, and Account: (red and yellow text were notes to myself as I transitioned into prototyping).





Step 10: Prototyping + Usability Testing

After creating wireframes, I fleshed them out in Adobe XD and created an app prototype. At the time, there was limited animation/user flow capabilities, so I exported screenshots of the app and connected them with InVision. I conducted a few usability test sessions following a script. The step-by-step prototype guide is also available but was not given to participants. Below is a summary of the usability test results along with key findings and recommendations:

Hi, [NAME] . I'll be walking you through this usability test session. Before we begin, I'd like to give you a little more background on this project. I'm asking people to test out a mobile app I've been prototyping, to gauge whether it's working the way I intend it to. I do want to make it clear that I'm only testing the app, not you. There are no wrong answers or mistakes, so don't worry or censor yourself in any way. Also don't worry about hurting my feelings--I want to improve the prototype and would like to hear your honest reactions. As you go through the app, I'd like you to think out loud. Talk me through your thought process; what you're doing; what you see. This will be a big help to me.

If any questions pop up along the way, feel free to ask them. I might not answer right away since I'm interested in seeing how people react without outside influence. But if you still have questions when we're done I'll try to answer them then. And if you need to take a break at any point, just let me know. Now I'd like to ask for your permission to record this session using a microphone and a screen recorder. I want to figure out how to improve the app with your feedback. The recordings will only be used for this project and will help me take notes more easily. If you'd like, please sign this simple permission form.

[start recording]

So I just have a few background questions before we go to the app.

- *Do you typically share expenses with friends or family? If so, in what type of situations?*
- *What do you look for in an expense sharing tool?*
- *Have you thought of any features you'd like to see that you currently don't have?*

Great, thanks so much. Now let's move on to the app. First, I'm going to ask you to look at the homepage and tell me what you think: if anything stands out to you, how you would categorize the app, what functions you think it can do. Just look around and come up with a story.

Now I'm going to ask you to try doing some specific tasks. All the information has been filled out ahead of time so you won't be entering anything in, just click through the steps that are intuitive to you. I'm going to read each task aloud and give you a printed copy. Again, please think out loud as you go along.

- *Create a new money request*
- *Cancel a pending outgoing request*
- *Sort past transactions by highest to lowest*
- *Link a credit card to your account*

[follow up questions]

- *Did you face any difficulties?*
- *Were you confused at any point?*
- *What feature did you enjoy using?*
- *I noticed you [did this/pattern] can you elaborate more?*
- *What did you think about [specific task]?*

Now that we've finished our test session, do you have any questions for me?

[answer/address remaining]

[stop recording]

Thanks so much for your help, I really appreciate your time. Have a great rest of your day.

Usability Findings & App Prototype

After conducting a few usability sessions using the first draft of my InVision prototype, I revamped the interface and took key findings into consideration.

Methodology

5 Participants

- 2 Male | 3 Female
- Age 21-45

Usability Script

- Brief Introduction
- Guided/unguided Q's
- Verbal Feedback
- Non-verbal Feedback
- Recordings w/ Consent

Summary

Task Accuracy (Self)

- Manage Pending: 80%
- Use Tip/Split Tools: 80%
- Create Payment: 100%
- Sort Past Transactions: 100%

Results

- Preference: Account/Payments
- Core Functions: Easy Navigation

Areas for Improvement

- Branding/Design
- Minor Task Flow Logic
- Prototype Redesign

Findings: Homepage

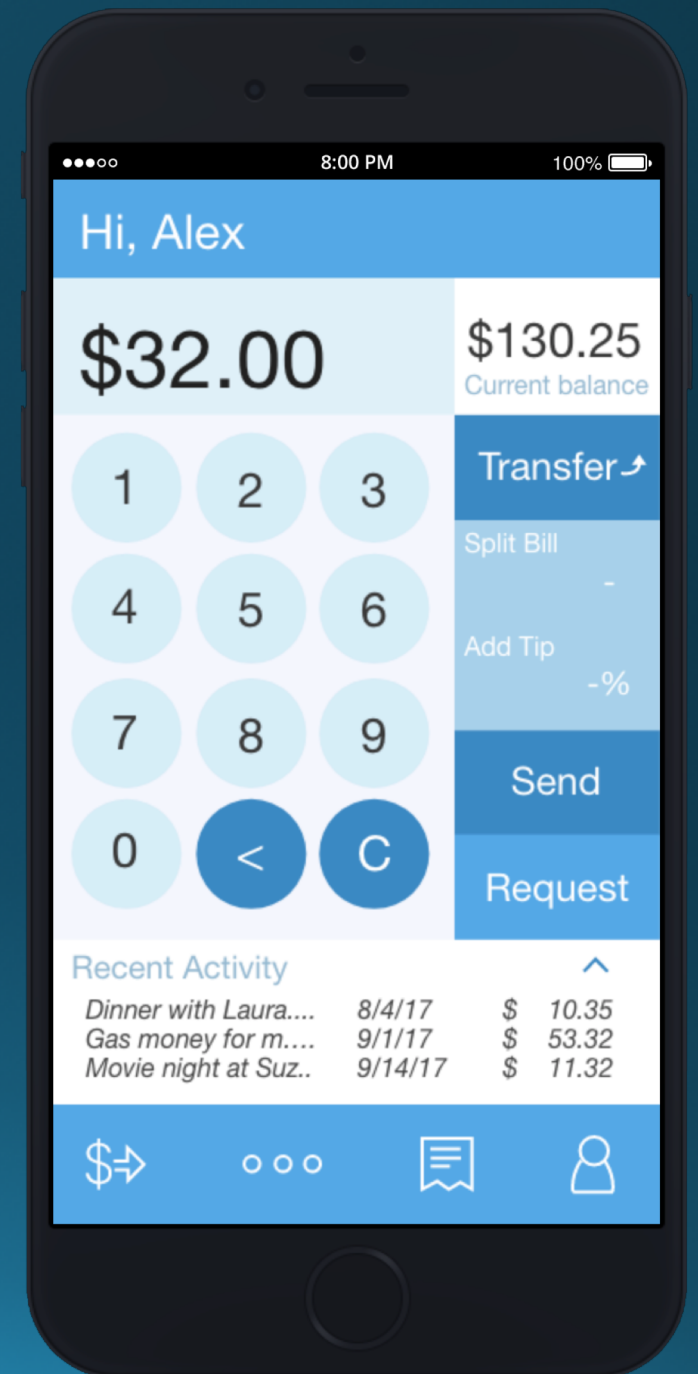
Feedback

- Right side buttons cramped (60%)
- Color & design – revisit (40%)
- Cramped text - recent activities (20%)
- "<" & "C" ambiguous (40%)

"...not sure I'd get much use out of 'recent activity', text is small and easy to gloss over."

"Right side buttons don't seem to have equal functions, also 'split' and 'tip' hard to read"

Recommendations: design revamp prioritizing important elements on the page.



Findings: Payments

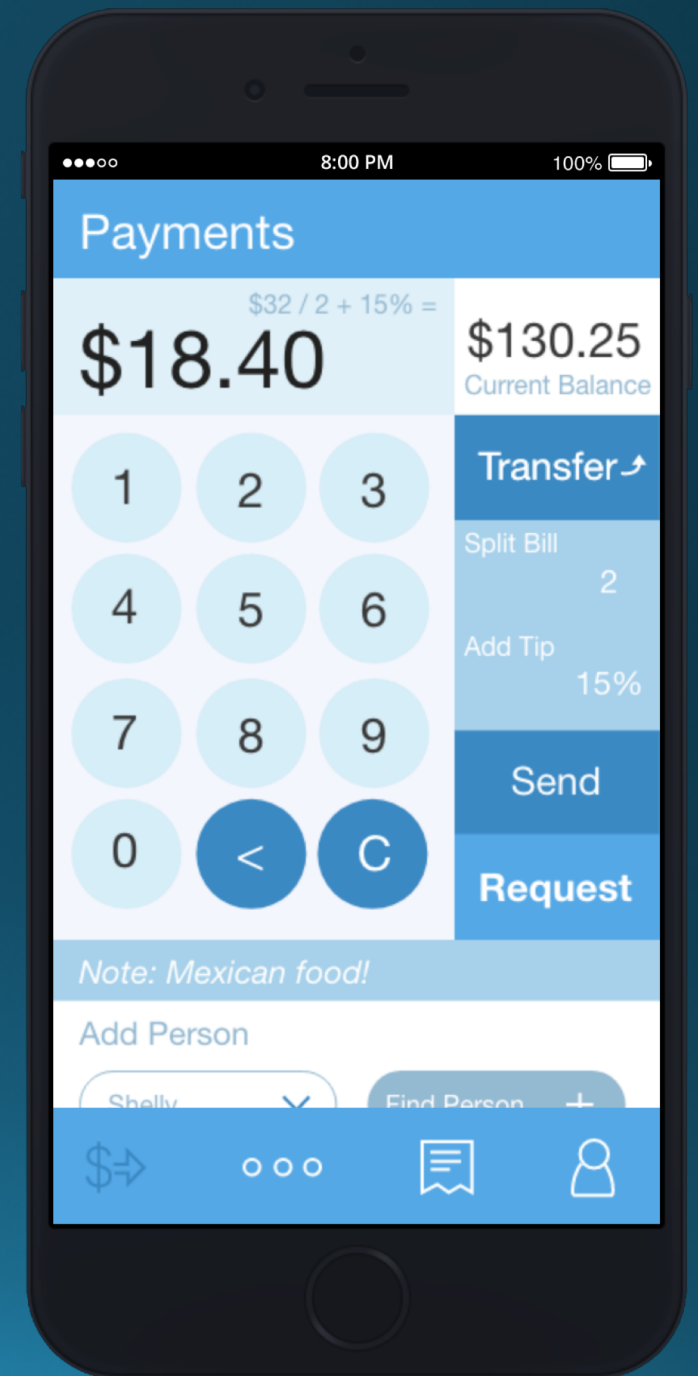
Feedback

- Calculations/functions Intuitive (40%)
- Selection of send/request too subtle (20%)
- Wanted to see more actions in prototype (60%)
- Nav bar highlight – dark, can't see (40%)

"...liked that you could jump to this functional/design from the homepage, feels familiar."

"Lots of options to scroll through—maybe an expansion suggestion?"

Recommendations: expand prototype functionalities, clean up ambiguity and elements



Findings: Pending

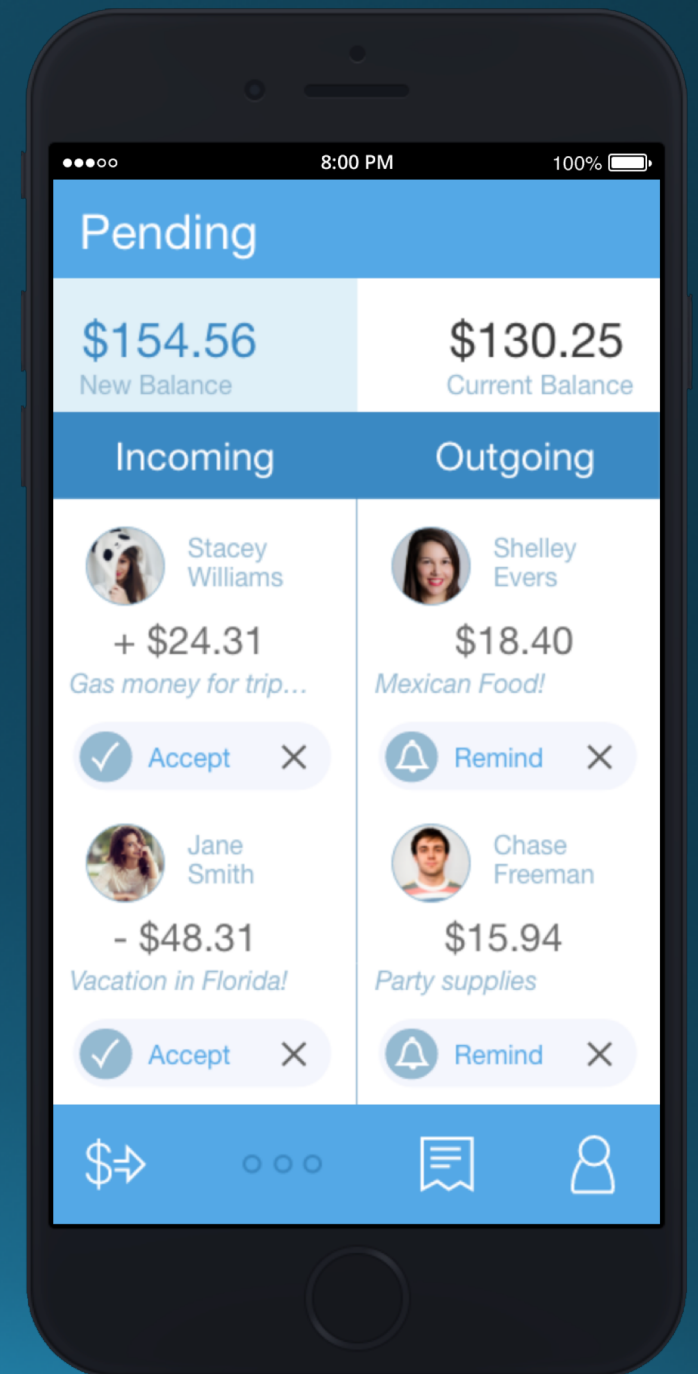
Feedback

- Intuitive parallel layout (40%)
- Confusion: incoming +/- transactions (20%)
- Furrowed brows, hovering over incoming column
- Spacing/design of accounts – redone (40%)

“...like the concept of this page but I can’t get past the unequal options and incoming/outgoing differences, still have some confusion there.”

“... suggest a way to make it easier to accept money be default and harder to cancel or reject.”

Recommendations: clean up design experience and functionalities while keeping parallel layout intuitive.



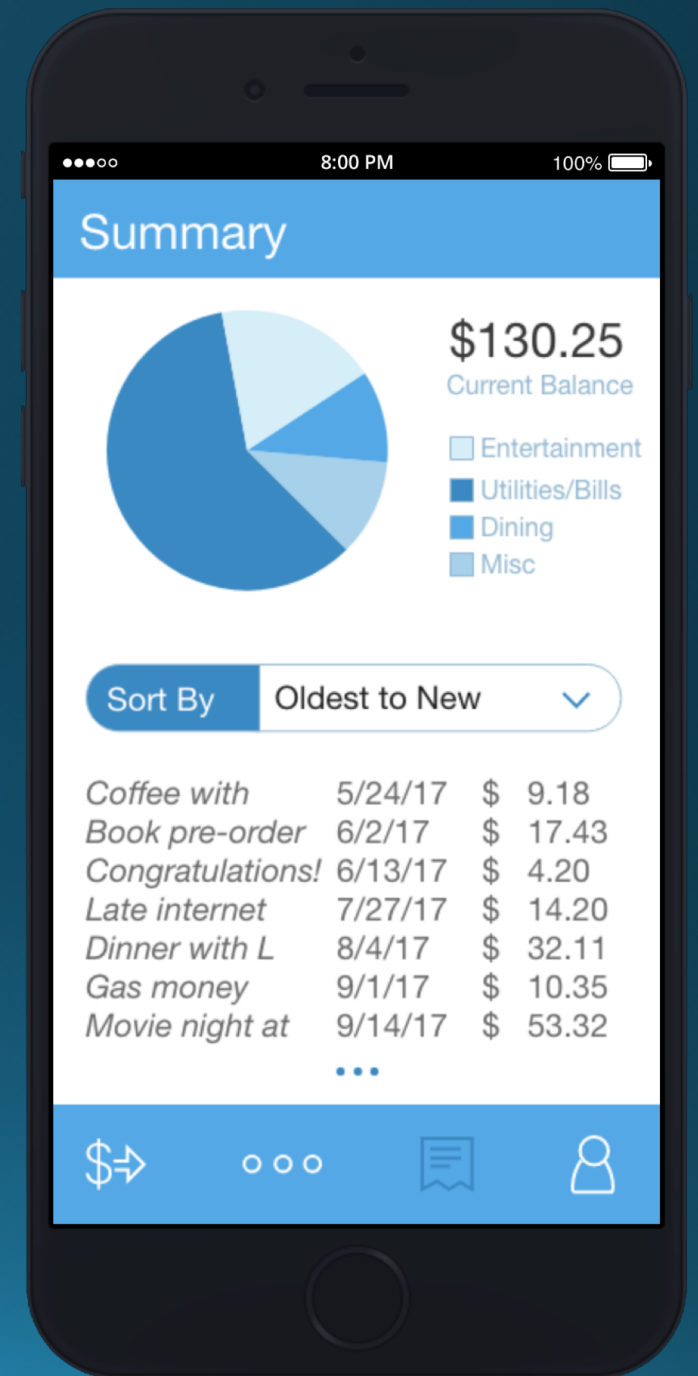
Findings: Summary

Feedback

- Quick exploration, click to menu (80%)
- Spent least amount of time on this page (60%)
- Expressed most interest in “group” & “type”

“...I’m not sure I would use this function very often unless there was another incentive here—maybe pair it with a budgeting tool? I think it’s also because I use expense-sharing apps as a supplementary payment, so it’s not a ‘central’ location for all my transactions.”

Recommendations: revisit “sort by” menu, consider expanding functionality type/presentation on page.



Findings: Account

Feedback

- Advanced options – expansion?
- Define sections clearly (20%)
- Spent less time on page (40%)

"...not sure I like the help section in general."

"Maybe find a way to section out this page? There are a lot of options my eyes are glossing over."

Recommendations: revisit content and prioritize according to level of importance and account change/impact, clean up design

