

BillChop

Divide and conquer your receipts in three easy steps

Capture



Take a photo of your receipt, and we'll automatically generate a sortable list of the items you've purchased.

Select



Select each friend you want to split with and what items they're responsible for. Items can be split among one friend or many.

Charge



Seamlessly request payment from your friends using our built in Venmo feature. All they need to do is accept.

BillChop Team Members



Back-end Team

Peter Kaplan

- pkap
- Key strengths: organization, app naming and slogans

Joeseeph Kunnath

- jmkunnat
- Key strengths: back end development

Ramana Keerthi

- Ramanak
- Key strengths: building web apps

Front-end Team

Katie Matton

- katiemat
- Key strengths: business strategy and marketing, machine learning

Will Stager

- wstager
- Key strengths: design, front-end development

Mazen Oweiss

- moweiss
- Key strengths: front-end development (android), interviewing people

Sagar Singichetti (project manager)

- singichs
- Key strengths: front-end dev, React, motivating people

Initial Interviewee - Breakdown



Total number of people interviewed: 33

- 91% of interviewees live with 3+ other people
- 32% of those interviewed said that they split restaurant/meal bills at least once a week

Interview Results: Main Takeaways



Splitting bills is a common practice:

- Over 55% of those interviewed split bills at least once a week

Consumers are frustrated with current methods of bill-splitting

- 94% of those interviewed said they have used a calculator along with Venmo to calculate and split bills and 65% said this is often a tedious process

Interview Results: Pain-points



- 47% of those interviewed said that they split the total amount of bills evenly even though the value of items purchased varied from person to person “at least somewhat often” and 92% of these people were moderately to severely annoyed that this happens
- 72% of people interviewed said they have felt awkward informing someone that they owed them money at some point within the last year
- 54% said they believe they have been mischarged on Venmo in the past

Interviewee Experiences

“Sometimes it sucks when we grocery shop and have to go through a receipt item by item to figure out who bought what and then add them all up. We have like four calculators going at once because sometimes people split stuff, or have individual purchases on one bill.”

Interviewee Experiences

“If I don’t charge someone immediately after I pay for something we are sharing I often forget to charge them or forget the amount that they owe me. Keeping track of receipts and associating them with who split what is almost impossible.”

Updated VPC

The Value Proposition Canvas

Value Proposition

Simple bill splitting for quick calculation and payment of money owed

1. Ability to assign items to individuals responsible for splitting their cost (transferer)
2. Automatic scanning of receipts to produce understandable list of purchases
3. Guarantee of accuracy of payment calculation and receipt evidence stored to support this (transferer)
4. Easy payment within app using Venmo or Stripe (transferer)

1. Calculation of money owed is fast and accurate due to automatic receipt scanning and precise indication of item split breakdown
2. BillChop's simple UI makes it easy to assign individuals to items so that calculation is done based on who is responsible for each item
3. Interpreting receipt, making payment calculations, and paying up are all done through app, so users do not have to switch between various technologies and methods
4. Receipts are saved so that all individuals can verify that the amounts they owe/are owed are accurate and therefore there are no feelings of awkwardness or resentment between those sharing purchase

1. BillChop saves users time by providing end to end solution so that users don't have to switch between different technologies and calculation methods
2. BillChop reduces anxiety that comes with the fear of charging someone or being charged the wrong amount as calculations are guaranteed to be accurate and on a per item basis
3. Tediousness and complexity of per item calculation is removed as the app automatically determines this after users assign individuals to items



Customer Segment

Shared purchasers

1. Ability to easily make complex purchase splitting calculations such as when different subsets of the group split different items
2. Automatic scanning of receipt; no manual entry necessary
3. Guaranteed accuracy of amount owed calculations with clear evidence to support it
4. No tension or resentment among housemates or friends based on belief of being incorrectly charged or underpaid

1. Accurately determine the amounts owed by each individual after making shared purchase
2. Inform individuals of amounts owed and collect money in a short amount of time (transferer)
3. Buy items for entire household such as groceries and cleaning supplies to share
4. Pay back those who fronted the cost of shared items (transferer)
5. Maintain friendly relations with all individuals involved in shared purchase and avoid tensions that come with maintaining prolonged debts
6. Accurately determine the amounts owed by each individual from meal purchase with the addition of tip

1. Excessive time and energy spent figuring out amounts owed when purchases and sharing patterns are complex
2. Process of calculating and paying up is not end-to-end, so customers have to learn to use and switch between multiple methods of computation, and this takes significant time
3. Most commonly used methods of purchase fee splitting (calculator and venmo) require people to trust that the charger inputs the correct amount; payers have no real evidence
4. If app is used for calculation and payment, all individuals must download and pay for app

Shared Purchasers: Jobs



1. Accurately determine the amounts owed by each individual after making shared purchase
2. Inform individuals of amounts owed and collect money in a short amount of time (transferer)
3. Buy items for entire household such as groceries and cleaning supplies to share
4. Pay back those who fronted the cost of shared items (transferer)
5. Maintain friendly relations with all individuals involved in shared purchase and avoid tensions that come with maintaining prolonged debts
6. Accurately determine the amounts owed by each individual from meal purchase with the addition of tip

Shared Purchasers: Pains



1. Excessive time and energy spent figuring out amounts owed when purchases and sharing patterns are complex
2. Process of calculating and paying up is not end-to-end, so customers have to learn to use and switch between multiple methods of computation, and this takes significant time
3. Most commonly used methods of purchase fee splitting (calculator and venmo) require people to trust that the charger inputs the correct amount; payers have no real evidence to go off of
4. If app is used for calculation and payment, all individuals must download and pay for app

Shared Purchasers: Gains



1. Ability to easily make complex purchase splitting calculations such as when different subsets of the group split different items
2. Automatic scanning of receipt; no manual entry required
3. Guaranteed accuracy of amount owed calculations with clear evidence to support it
4. No tension or resentment among housemates or friends based on belief of being incorrectly charged or underpaid

Shared Purchasers: Project & Services



1. Ability to assign items to individuals responsible for splitting their cost (transferer)
2. Automatic scanning of receipts to produce understandable list of purchases
3. Guarantee of accuracy of payment calculation and receipt evidence stored to support this (transferer)
4. Easy payment within app using Venmo or Stripe (transferer)

Shared Purchasers: Pain Relievers



1. BillChop saves users time by providing end to end solution so that users don't have to switch between different technologies and calculation methods
2. BillChop reduces anxiety that comes with the fear of charging someone or being charged the wrong amount as calculations are guaranteed to be accurate and on a per item basis
3. Tediousness and complexity of per item calculation is removed as the app automatically determines this after users assign individuals to items

Shared Purchasers: Gain Creators



1. Calculation of money owed is fast and accurate due to automatic receipt scanning and precise indication of item split breakdown
2. BillChop's simple UI makes it easy to assign individuals to items so that calculation is done based on who is responsible for each item
3. Interpreting receipt, making payment calculations, and paying up are all done through app, so users do not have to switch between various technologies and methods
4. Receipts are saved so that all individuals can verify that the amounts they owe/are owed are accurate and therefore there are no feelings of awkwardness or resentment between those sharing purchase

College Student



Who They Are:

- Ages 18-21
- Very socially affluent, loves going out with friends
- Lives in dormitory or apartment on or near campus
- Primary source of funds from part time job and parents
- Deals with significant college debt
 - \$30,852 in Michigan
 - 70% worry about finances**
- Has about \$6,000 to spend over the course of the school year****

What They Think:

- Feels taken advantage of when they pay more than they should
- Feel significant stress when they go over budget
- Believes in honesty and equity when it comes to money
- Values recommendations from friends

What They Do:

- Gets takeout 3-4 times a week
- Spends about \$760 a year eating out ***
- Spend about 17 hours a week studying outside of class*****
- Often is a part of communal purchases made with friends (food, groceries, household items, alcohol)
- Buys alcohol from grocery /liquor stores about once a week to share with friends
- Frequently goes to house-parties and potlucks where everyone is expected to chip in
- Downloads 2-3 new apps per month
- Lives with 3-5 other students
- Has and uses Venmo frequently

Young Professionals

Who They Are:

- Ages 22 - 28
- Bachelors or Masters Degree
- Employed full-time
- Trying to pay off college loans
- Lives in a big city
- Lives with 1-2 roommates
- Single, no kids
- Income: \$50K/year*

What They Do:

- Works 40-60 hours a week**
- Goes to bar/clubs 2-4 times a week; often pays for others drinks and forgets to charge them
- Goes to lunch with work colleagues or orders lunch for his/her team to the office
- Goes out to eat 3-5 times a week, generally at sit-down restaurants****
- Actively look for new technology to try
- Tries 3-5 new apps a month; of these, usually keeps 1 of them on their phone permanently

What They Think:

- Making more money than they ever have, so more readily fronts group purchases
- However, looking to save money in efforts to pay off college loans, so is concerned about monitoring spending habits and not losing money when making group purchases
- Competitive when it comes to their career**
- Value being seen as an early technology adopter / having the latest technology
- Want to appear to be relaxed about money in front of friends, but does care about being paid back in full

Middle Aged Working Class



Who They Are:

- 35-50
- Income: \$30-\$100k/year*
- Married, with 2-3 kids
- Homeowner in suburbs
- Trying to save for retirement and college for children
- Paid hourly
- Has job involving manual labor
- Highest level of education is high school or some college; no advanced degrees

What They Think:

- Feels awkward about asking friends and family members to be paid back, especially those that are more well-off
- Money and budgeting causes them significant stress
- Hesitant to try new technologies; resistant to change
- Motivated to try technology recommended by friends and also on TV/in the news

What They Do:

- Carefully budget finances and keep track of spending history
- Spends ~10% of their income on entertainment and eating out
- Works 40 hours/ week**
- Spends most of their free time going to kid's activities, completing household chores, and spending time with friends and family
- Front purchases related to kids event's: soccer team dinners, theater group costumes, practice materials for math club, etc.

Travelers



Who They Are:

- 18-34 years old
- Study abroad students, backpackers, roadtrippers, and recent grads
- Single, no kids
- Income: \$35K/year*

What They Think:

- 40% of millennial international travelers wish they could be more like who they describe themselves to be on social media**
- Travel in order to spend quality time with a partner, reduce stress, and/or find more excitement in life**
- Would rather spend money on experiences than material things***
- Set on traveling now, even with limited funds, because they don't want to wait for a future that isn't guaranteed****
- Concerned about traveling on a budget*****

What They Do:

- Avid mobile device users; frequently book travel accommodations on phone*****
- Take lots of photos
- Eat out often with new people
- Split snacks and travel necessities with their group
- Have a travel budget (on average \$50/day)*****
- Travel for an average of 58 days at a time*****
- Use lots of mobile apps to help find travel deals: AirBnb, Skyscanner, Lonely Planet*****

Interview Results: Key Findings



Interviewed a total of 35 people: 12 college students, 9 young professionals, 7 middle aged working class individuals, and 7 travelers

College Students

- Most apps and other technology they've tried they did so because of a friend recommendation
- Many felt that they overpay as part of the "I'll get this one, you get the next one" attitude that roommates and friends have towards group purchases
- 58% of those interviewed have gotten into a disagreement with a friend over money owed in the past year

Young Professionals

- Most common scenarios in which they make group purchases are dining out and going out to bars
- Frequently to charge friends for drinks purchased the day after a night out
- 67% seek out and try new technologies before they are widely used
- 78% feel pressure to appear relaxed about money they are owed in front of friends and coworkers
- "I have been in situations where I have ordered cheaply to try to save money, but have still split the bill evenly when the group wanted to"

Interview Results: Key Findings



Middle Aged Working Class

- Don't download new apps frequently; 71% hadn't downloaded a new app in the last month
- General attitude is that they will only try technology that is recommended by others (friends, family, TV or newspaper reviewers)
- A couple different people mentioned that they could an easier method of determining who owes how much when large purchases with many items were made; specifically mentioned buying items for kid's clubs/teams and buying stuff for themselves at the same time
- 86% follow a budget closely and track purchase history carefully

Travelers

- All people interviewed said that when traveling, they frequently make shared purchases with the group
- ~43% said they take turns buying items as a means of making the payments fair; ~57% said that they write totals/save receipts and calculate amounts owed at the end of the trip
- 86% said they closely follow a budget when traveling
- "It can be hard to keep track of what I spend during a trip and who owes me money. When you're on the go, it's really easy to lose receipts, and in general you aren't really focused on having people pay you. But, when the trips over, I often find myself wishing I was more careful about keeping track of what I had bought for the group."

Varun - Student



Varun is a computer science student at the University of Michigan. He frequently gets dinner with his EECS group and is seeking out a way to split fees better without having to manually calculate everyone's cost.

Goals

- Have an easy to use app to scan receipts
- Be able to easily split bills with a few clicks
- Be able to easily split bills on a per item basis and show

Thinking/Mentality

Doesn't want to overpay by splitting bills evenly when he spent less than others

Likes apps that are simple and fast to use

Would like to be able to offer "proof" to others of how much they owe him

Why Buy?

- Unlike other apps, BillChop will allow users to store receipts and receive payments from others

Influencers:

- Friends
- Classmates

Buyer Journey/Process

- Comes across BillChop while at dinner with his friends >> downloads app on the spot in order to pay his portion of the bill >> reports to other friends about the convenience of the app

Channels

- Word of Mouth
- Advertisements around campus
- Bars and restaurants

Content/Info

- Recommendations from friends
- Reviews on blogs
- Social Media posts about convenience factor

Tiberiu - Young Professional



Tiberiu is a recent college grad working as a software developer in New York City. After long days at work, he often goes out to dinner and bars with his friends. They often pay for each other's drinks and even split bills, with the attitude that it will all even out in the end. However, Tiberiu is fairly certain that he ends up overpaying.

Goals:

Keep accurate running balances with his friends so he knows he is paying the correct amount.

Split dinner bills accurately and quickly, accounting for tip and tax.

Thinking/Mentality:

Likes trying out and showing his friends new technology and apps; takes pride in being an “early adopter”

Doesn't want to appear uptight about his friends owing money, but does want to be consistently repaid in full

Why Buy?

No other apps split receipts and maintain running balances

Wants to be able to split complicated dinner receipts quickly and to save bar receipts to charge friends the next day

Influencers: friends, news, Tech blogs, co-workers

Buyer Journey/Process:

Reads about BillChop in TechCrunch article or hears about it from friend/co-worker >> downloads app and tests it out the next time he goes out with friends to keep track of the drinks he buys for people >> charges friends on Venmo through the app >> friends see that the request came from BillChop >> friends ask about and try it out as well

Channels

- Word of Mouth
- Facebook/ Social Media
- Tech blogs

Content/Info

- Recommendations from friends and co-workers
- App store reviews
- Reviews on Tech/ Consumer product blogs

Sue - Middle Aged Working Class



Sue is a middle aged mother of two who works as a receptionist at a high school, and whose family lives in the suburbs of Aurora, Colorado. Much of her free time is spent taking care of her two kids Niki and Robby, who are 13 and 10 respectively. As the manager of both of her kid's soccer teams, Sue often fronts payments for games and team parties and then has other parents pay her back.

Goals:

Avoid having to keep track of payments and ask to be paid back in person, at a date far after payment

Be able to be paid back exact amount she spent on others' kids, as she is on strict budget

Thinking/Mentality:

Needs to get paid back for money spent on her kids' teammates, as she is saving for her kids' college tuition

Would like way to charge other parents immediately to avoid having to ask them in person later, where they likely will not have the exact cash for it, and may not have Venmo

Why Buy?

Current method of keeping track of who owes what on paper is time consuming and prone to error

No other app allows her to maintain running balances with other people and determine amounts owed directly from the receipt

Influencers: Other parents, co-workers, her children, parenting blogs

Buyer Journey/Process

Hears about BillChop from parent on Niki's soccer team >> has the parent demo it to her to see how app can help her get paid back for money fronted at tournaments and other events >> downloads app before the next tournament >> uses it to calculate amounts owed by each parent for team apparel purchases, team dinner, and snacks that she bought for the team

Channels

- Word of mouth from other parents
- Facebook group/Email thread for parents of the team
- Parenting sites and blogs
- Finance managing sites and blogs

Content/Info

- Recommendations from other parents
- Reviews on parenting or budgeting blogs
- Reviews from friends on social media

Tom Traveler

Tom is a 27 year old single backpacker who travels for extended periods of time on a tight budget and enjoys meeting other travelers and exploring foreign cultures. Tom often pays while eating with other travelers and is concerned he does not get paid back all the money he's owed.



Goals

Be able to quickly include charge people that he doesn't know well

Notify people with amount owed and proof so payment can happen as soon as possible

Thinking/Mentality

He wants to be paid the right amount from people he may never see again

Loves any technology that improves his travelling experience, but doesn't want to deal with difficult learning curves of complex apps

Why Buy?

Tom is always on the go and doesn't want to spend time calculating who owes what amount

Influencers

Travel companions, friends, travel blogs

Buyer Journey/Process

Sees BillChop in action while getting tapas with people he met in his hostel >> remembers and downloads app next time he eats with multiple people >> charges his fellow travelers and they note the convenience >> they download it next time they share payments

Channels

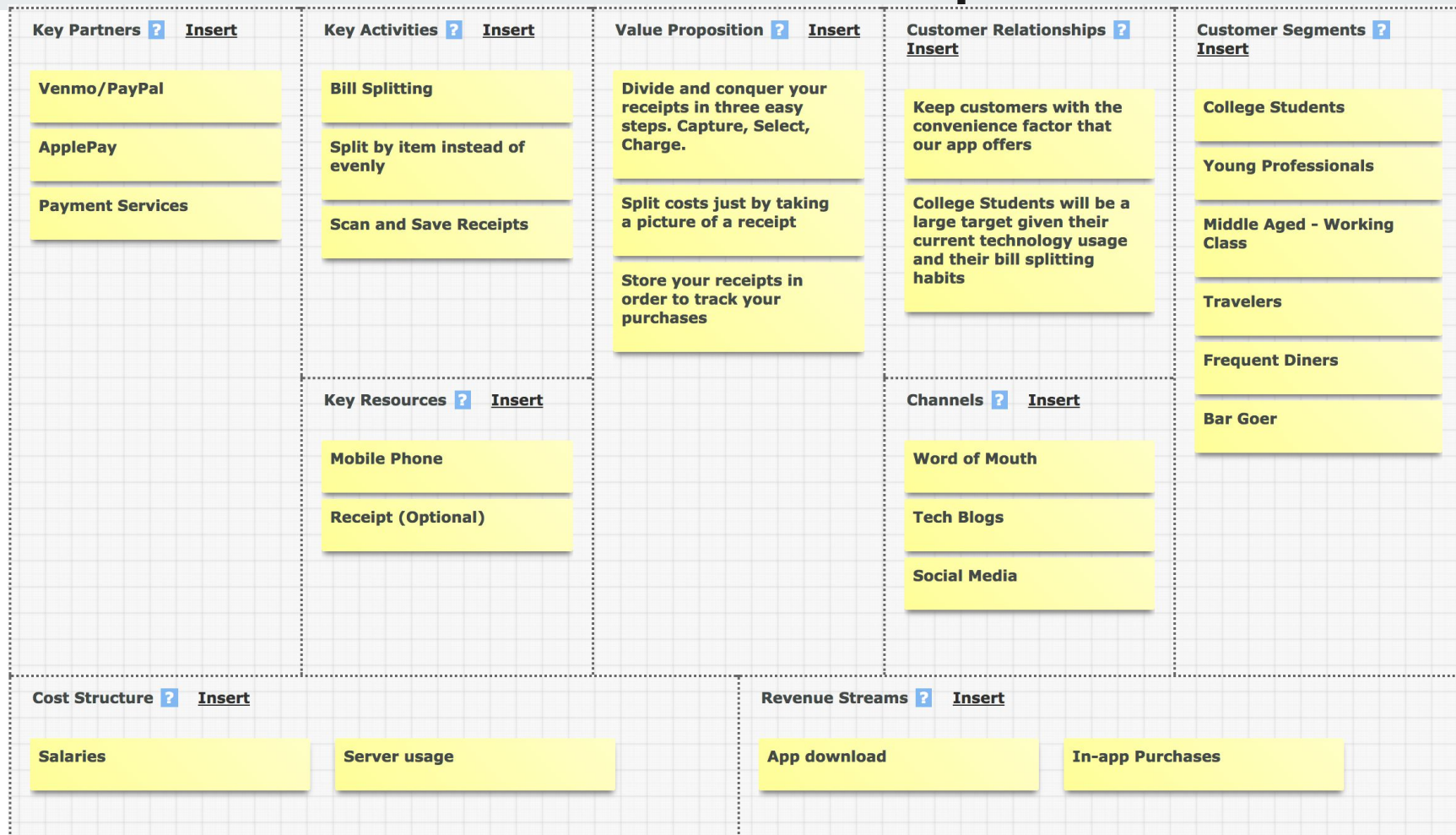
- Word of mouth from other travelers
- Blogs/sites about travelling on a budget
- Hostels

Content/Info

- Recommendations from other backpackers, friends, travel blogs, hostel roommates

<u>Obvious Competitor</u> BillPin	<u>Strengths</u> Group capabilities	<u>Weaknesses</u> Does not take pictures of receipts	<u>Our Advantage</u> Users can split bills simply by taking a picture of their receipt
Splitwise	Easy to settle up	Cannot upload pictures	Users can upload and save pictures of receipts
Tab	Scan receipts	1 hour limit	Pictures are saved until deleted by user
Divvy	Scan receipts	Inability to search contacts	Ability to easily add phone contacts to payment group
Billr	Supports all currencies	Not in the US Appstore	Available in the US Appstore

Business Model Canvas for BillChop



TAM SAM SOM

1 <http://clients1.ibisworld.com.proxy.lib.umich.edu/reports/us/industry/ata glance.aspx?entid=4756>
2 https://medium.com/@sm_app_intel/a-bunch-of-average-app-revenue-data-and-why-you-should-ignore-it-2bea283d37fc
3 <https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/>
4 <https://www.statista.com/statistics/270291/popular-categories-in-the-app-store/>

Total Addressable Market: \$311.9m

- All individuals who use some form of personal finance or money management software
- \$311.9m: Projected 2017 Revenue for Personal Finance and Money Management Software Development Industry¹

Serviceable Available Market: \$16.37m

- All individuals who use social spending mobile apps, receipt scanning apps, or spending history tracking apps
- Size of finance mobile app market: \$310 (average annual revenue of finance app²) * 2.2m (#apps in Apple App store³) * .024(percentage of apps that are finance apps⁴)

Serviceable Obtainable Market: \$940,000

- 70% of the market of users who scan receipts; 5% of the market for peer to peer spending and budgeting
- \$16.37m (SAM) * .184 (% of finance apps related to budgeting¹) * .05 + \$2.99 (average price charged for receipt scanning app) * .7 * 12 popular apps * 45,000 downloads /app * .7

Bottom-Up Sales Forecast

Sources: <https://developer.apple.com/app-store/subscriptions/>
<https://www.braze.com/blog/in-app-purchase-stats/>
<https://play.google.com/store/apps/details?id=com.bring10.tab&hl=en>
<https://www.androidauthority.com/google-play-store-vs-the-apple-app-store-601836/>
<http://smallbusiness.chron.com/calculate-mobile-ad-revenue-74440.html>

Value of Customer: \$2.09

$\$2.99$ (average receipt splitting app download cost) * $.70$ (Take-home percentage from the app * 25 (Percent of customers who buy In App purchase) * 3 (Expected # of repeat purchases) * $\$.99$ (Cost of IAP) = $\$2.823$

Expected Number of Sales:

7500 from Play Store (based on competitors receiving 10000 - $50,000$ downloads in the Play Store) + 12750 from IOS (App Store generates 70% more revenue than Play Store) = $20,250$ Sales

Expected Revenue: \$57,165

20250 (Expected Sales) * $\$2.239$ (Value of Customer) = $\$57,165$ Total Expected Sales Revenue
Total Revenue = $\$57,165$

Our total expected sales revenue \$57,165 vs Serviceable Obtainable Market: \$940,000

Our expected revenue is only 6.08% of the total serviceable obtainable market



Barriers to Entry

- Popularity of other competing applications such as Venmo and Splitwise
 - Venmo and Splitwise have established themselves as trusted apps for social spending
 - Significant testing done on competing applications to ensure high quality
 - Users may be hesitant to switch to new market offerings due to cost of learning to use new technology and a resistance to change
- Integration with Venmo for Splitwise
- High employment costs of development team; software developer are accustomed to high salaries (average industry employee earns \$140,000/yr¹) and non-traditional benefits (like unlimited vacation time)



Breaking through the Barrier

- Our “Secret Sauce”
 - Combining functionality of multiple different applications into one
 - Combining receipt scanning and cost splitting into one
 - Technical features of scanning and complex item splitting combined with social features such as creating and saving groups
- Once we are established
 - we will be able to integrate with Venmo and thus our service will become even easier to use; integrating with Venmo will also give our app credibility
 - Using our application instead of others will become instinct for people
 - People will be hesitant to switch to other apps because of learning costs and comfort that comes with lack of change
- Simple, intuitive UI/UX design will reduce learning cost associated with switching apps

User Persona - Jordan Kelley



"I'm happy to buy groceries for my roommates, but I wish getting paid back wasn't such a hassle."

Age: 19

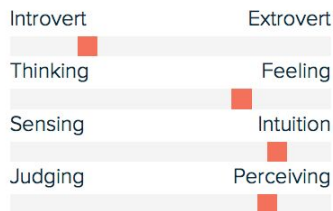
Work: Student

Family: Mom, Dad, Sister
(Unmarried)

Location: South Bend, IN

Character: Studious

Personality



Considerate

Busy

Frugal

Upbeat

Goals

- Manage time and personal finances efficiently
- Split groceries and occasional meals out with roommates
- Stay in good standing with roommates and avoid outstanding "IOU"s

Frustrations

- Roommates forget to pay him back for Costco trips he makes
- Dividing up the grocery bill takes excessive time and is often put off for weeks
- Reminding his friends to pay him in person can be awkward

Bio

Jordan is a college sophomore at Notre Dame University who lives with four other roommates in his apartment. As the only roommate with a car, Jordan frequently makes grocery runs for his entire apartment. While he doesn't mind buying specific items for his roommates, he often finds that he is not paid back promptly or in full following a purchase. This leads to frustration as Jordan is responsible for calculating amounts owed and repeatedly reminding his roommates to pay him. Thus, Jordan is looking for a way to simply divide his grocery receipt and charge his roommates directly.

Motivation

Incentive

Fear

Growth

Power

Social

Brands & Influencers



Preferred Channels

Traditional Ads

Online & Social Media

Referral

Guerrilla Efforts & PR

Bob Smith



"Eating out with my friends is the best part of my weekend."

Age: 28

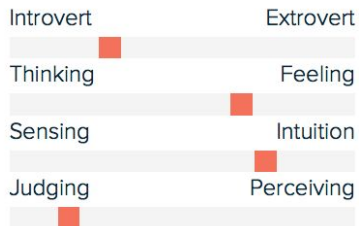
Work: Best Buy Assistant Manager

Family: Married, 2 kids

Location: Topeka, Kansas

Character: Group Leader

Personality



Patient

Friendly

Funny

Hard Working

Goals

- Quickly get paid back for food.
- Avoid having to do any manual calculations
- Prevent awkwardness within his group if people are not paid the exact amount owed.

Frustrations

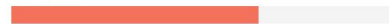
- Spend too long dividing up restaurant bills.
- Hates not being paid for appetizers he ordered for the group.
- Dislikes spending time figuring out if his math is correct.

Bio

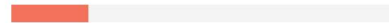
Bob is known for two things. The first as an Assistant Manager at Best Buy, and the second for being a foodie. Bob loves to take his friends and family out to new restaurants and experiences that he finds on Yelp. Bob doesn't mind fronting the bill in order to get people to join him on these group meals. However, he does mind not getting paid back. Recently his group meals have attracted larger and larger groups and some of the payments, especially with split appetizers, have gotten lost. Bob is looking for a solution to this problem. Bob wants to continue to front the meals but wants his dining experience to become completely hassle free.

Motivation

Incentive



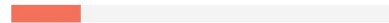
Fear



Growth



Power



Social



Brands & Influencers

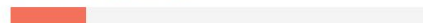


Preferred Channels

Traditional Ads



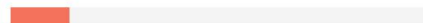
Online & Social Media



Referral



Guerrilla Efforts & PR



Bar 5



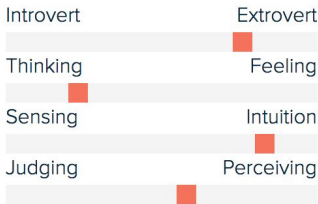
Robin Scherbatsky



"I love a scotch that is old enough to order its own scotch!"

Age: 23
Work: Journalist
Marital Status: Engaged
Location: New York, New York
Character: Work Hard, Play Hard

Personality



- Flirt
- Outgoing
- Low Tolerance
- Career Oriented

Goals

- Get paid back after a night out in the city with friends
- Improve money management
- Track receipts over an extended period of time

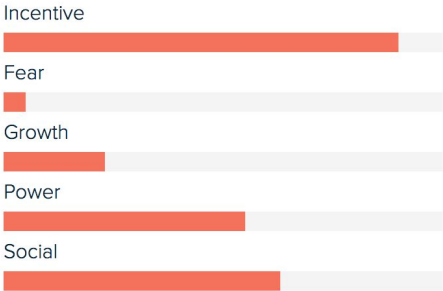
Frustrations

- Forgetting who ordered what drink
- Paying the entire bill at a bar for a group of friends
- Losing the receipt while out in the town

Bio

Robin is a journalist for World Wide News who puts her career before everything but always enjoys unfolding at a bar with friends after a stressful week. She recently realized the struggles of not having her friends pay her back for buying drinks and now is looking for a way to accurately split purchases with her friends. After a hazy night out in the town, she frequently forgets how many drinks she ordered and who ordered which drink so she is also looking for a way to enjoy the moment and worry about payments the next morning.

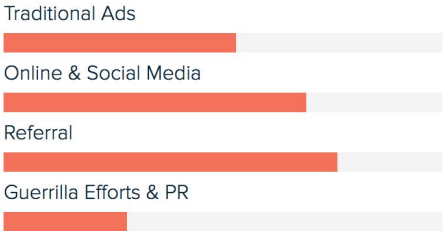
Motivation



Favorite Bars



Preferred Channels



Affinity Mapping

Users are frustrated by not being paid the right amount when making shared purchases

- 67% of interviewees indicated that they are bothered a lot if they are mis-charged, even when the inaccuracy is < \$5
- 54% said they believe they have been mischarged on Venmo in the past
- "If I don't charge someone immediately after I pay for something we are sharing I often forget to charge them or forget the amount that they owe me."

When purchases are complex, figuring out who owes who what can be time consuming and tedious

- "I never find myself charging my friends for the exact amounts owed for the drinks because I feel awkward about it since I offered to pay. If the people I bought drinks for never paid me back with drinks, all I can hope for is that they remember next time."
- About 72% of people interviewed said they have felt awkward informing someone that they owed them money at some point within the last year

People like to be able to look back on their spending habits and to ensure that all payments are fair

- "Being able to look back at your Venmo payments is the most valuable feature of the application in my opinion."
- 94% of people said they would love to have a way to track their payments in a receipt scanning application
- Keeping track of receipts and associating them with who split what is almost impossible."

Story Mapping

Value Proposition: Easily and quickly manage and split receipts.

Pay for group purchase	Split receipt items among group members	Compute finalized amounts owed	Charge group and receive payment	Manage past receipts
Automatic receipt scanning to produce itemized list	Tap items to select individuals responsible for them	Calculation of total amount per person based on item assignment	Notification sent to group members of exact amount owed	View history of your receipt photos
Edit receipt items to correct amounts if needed	Save groups to allow for easy future group selection	Addition of tip proportional to amounts spent	In-app payments or direct payments via Venmo	View history of all transactions involved in
Add tip to receipt total	Allow multiple app users to all edit item assignment	Addition of tax proportional to amounts spent	Receipt with individual cost breakdown sent to each individual	Maintain running balances among group members
Add additional items not on receipt	Processing of email receipts forwarded to app		Tap to pay with NFC on Android or QR code scan	

Non-Trivial Feature Breakdown and User Stories

1) Receipt scanning to automatically create itemized list with associated costs

Kayla is a 21 year old college student who shares an apartment with 3 other roommates. Kayla is only one among this group who has a car, so she frequently makes trips to Target for needed household items, such as paper towels, dish soap, and toilet paper, that are used by the whole group. Kayla takes pictures of her receipts with BillChop, so that she can quickly review and keep track of what items she bought and how much each cost.

2) Tap items to assign the responsible individuals to them and calculate amounts owed on a per person basis

Dave is a 27 year old who makes a modest living as a landscaping business owner. He frequently likes to dine out with his friends at the small diners around town. When the orders get complicated and the restaurants can't precisely split the bill (e.g. different people split appetizers and drinks and there are also individual orders involved), Dave doesn't mind fronting the bill for his friends. However, Dave watches his spending meticulously and works hard to follow his weekly budget. He uses BillChop to calculate the exact amounts that each of his friends owe him, so he can charge them accordingly. This relieves stress for Dave because he is no longer concerned that he is being underpaid by even a small amount.

Non-Trivial Feature Breakdown and User Stories

3) Notification sent to group members of amounts owed

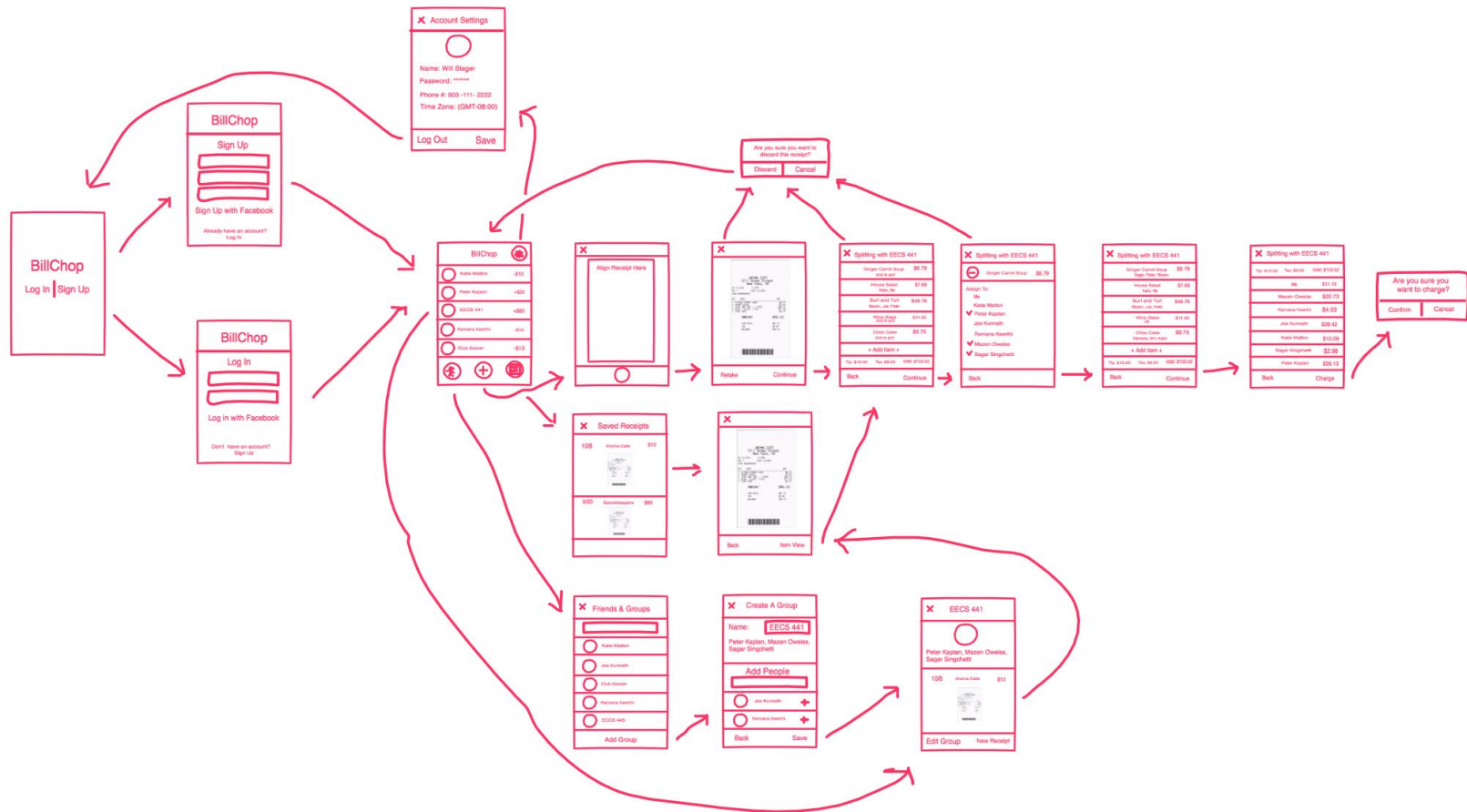
Joe Franklin is a 31 year old out at the bar with new friends. He has all of their phone numbers, but most of them haven't heard of BillChop and don't want to download the app while busy at the bar. Joe buys drinks for the group and snaps a photo of the receipt. The next day, he splits the bill accordingly and sends automated texts to his friends with the amounts owed and a picture of the receipt. Joes friends then review the receipt and pay Joe back for the amount he is owed via Venmo or otherwise. Additionally, they might choose to go download the app for future use using the link provided.

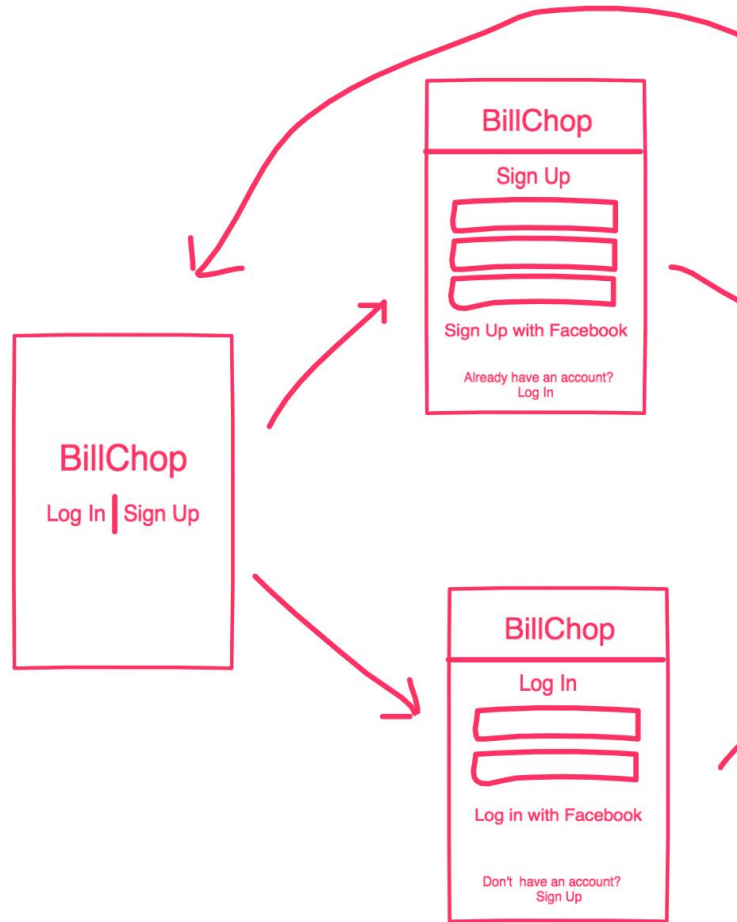
4) Group history with running balances stored

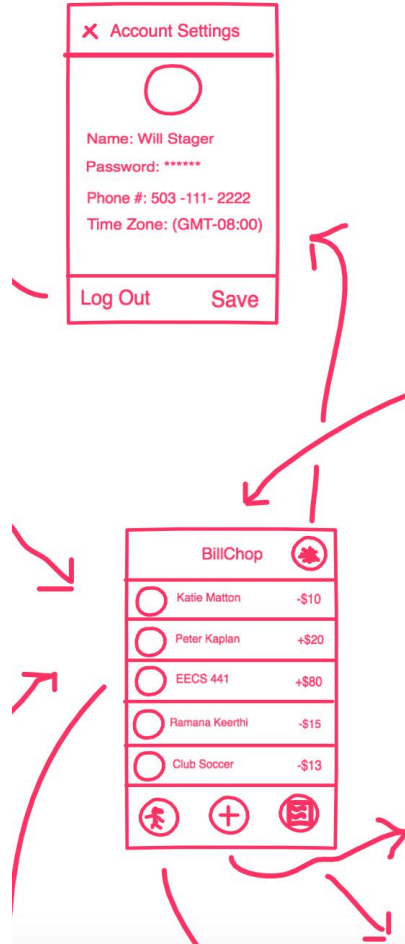
Sarah is a 17 year old high school student who decides to plan a road trip with her friends during Spring Break. Throughout the trip, each of the friends on the road trip pays for various items for the whole group (camping gear, snacks, souvenirs, etc). Sarah and her friends use BillChop to easily track all of their group purchases from the trip and keep a running balance of amounts owed. Using BillChop helps them to focus on enjoying their vacation by allowing them to avoid making small Venmo payments back and forth and to pay each other back just once at the end of the trip.

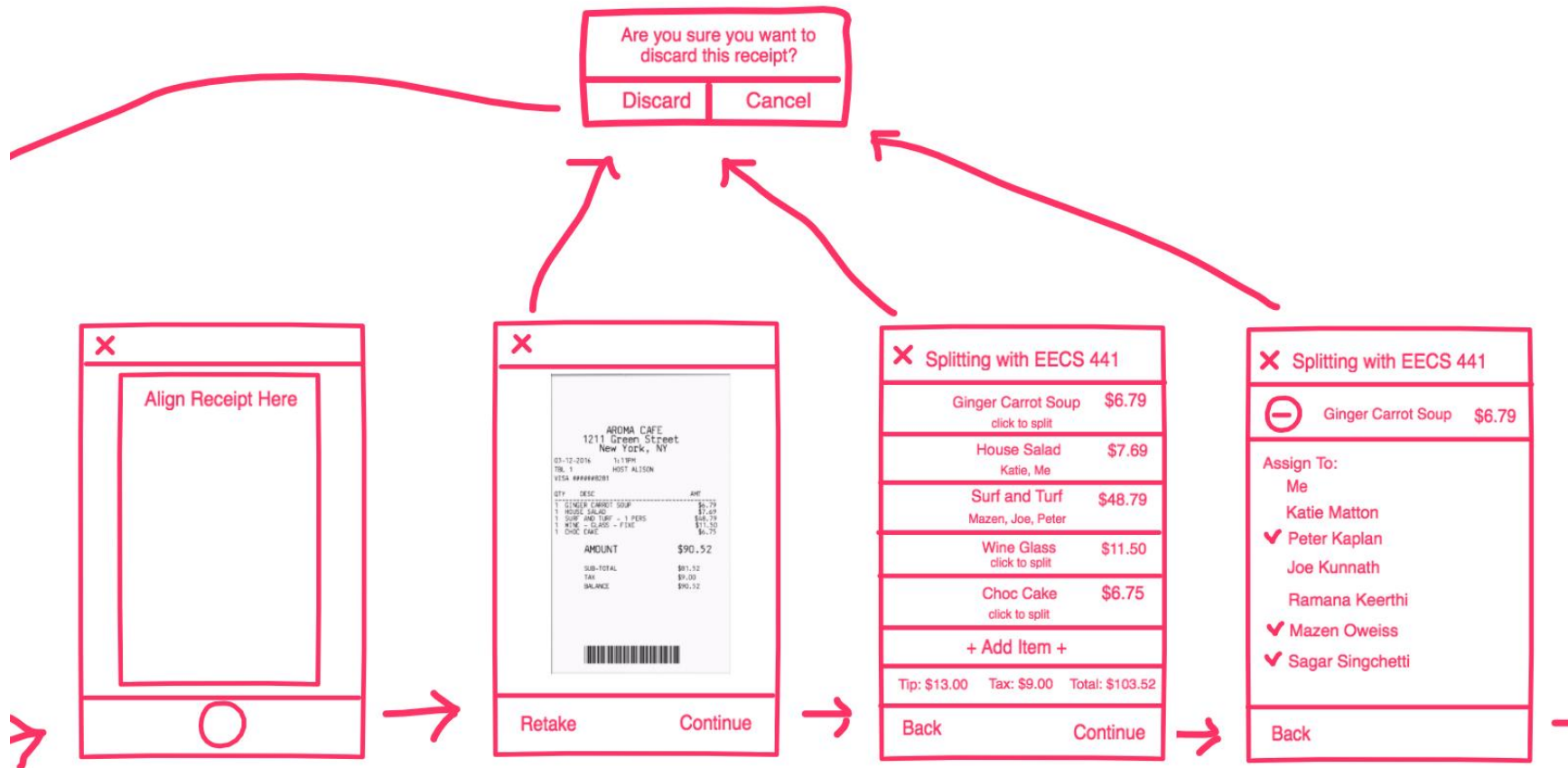


UI











✕ Splitting with EECS 441

Ginger Carrot Soup	\$6.79
Sagar, Peter, Mazen	
House Salad	\$7.69
Katie, Me	
Surf and Turf	\$48.79
Mazen, Joe, Peter	
Wine Glass	\$11.50
Joe	
Choc Cake	\$6.75
Ramana, Will, Katie	
+ Add Item +	
Tip: \$13.00	Tax: \$9.00
Total: \$103.52	
Back	Continue



✕ Splitting with EECS 441

Tip: \$13.00	Tax: \$9.00	Total: \$103.52
Me	\$11.15	
Mazen Oweiss	\$20.73	
Ramana Keerthi	\$4.03	
Joe Kunnath	\$28.42	
Katie Matton	\$10.08	
Sagar Singchetti	\$2.98	
Peter Kaplan	\$26.13	
Back	Charge	



Are you sure you want to charge?

Confirm | Cancel



Saved Receipts

10/8

Aroma Cafe

\$10

9/20

Scorekeepers

\$80



AROMA CAFE
1211 Green Street
New York, NY

05-12-2016 1:11PM
TBL 1 HOST ALISON
VISA #####0201

QTY	DESC	AMT
1	GINGER CARROT SOUP	\$6.79
1	HOUSE SALAD	\$7.69
1	SURF AND TURF - 1 PERS	\$38.79
1	WINE - GLASS - FINE	\$11.50
1	CHOC CAKE	\$6.75
AMOUNT		\$90.52
SUB-TOTAL		\$81.52
TAX		\$9.00
BALANCE		\$90.52

Back

Item View





 Friends & Groups

☐

 Katie Matton

☐

 Joe Kunnath

☐

 Club Soccer

☐


 Ramana Keerthi

☐

 EECS 445

Add Group



 Create A Group

Name:

Peter Kaplan, Mazen Oweiss,
Sagar Singchetti

Add People

☐


 Joe Kunnath +


☐

 Ramana Keerthi +

Back Save




 EECS 441



Peter Kaplan, Mazen Oweiss,
Sagar Singchetti

10/8 Aroma Cafe \$10

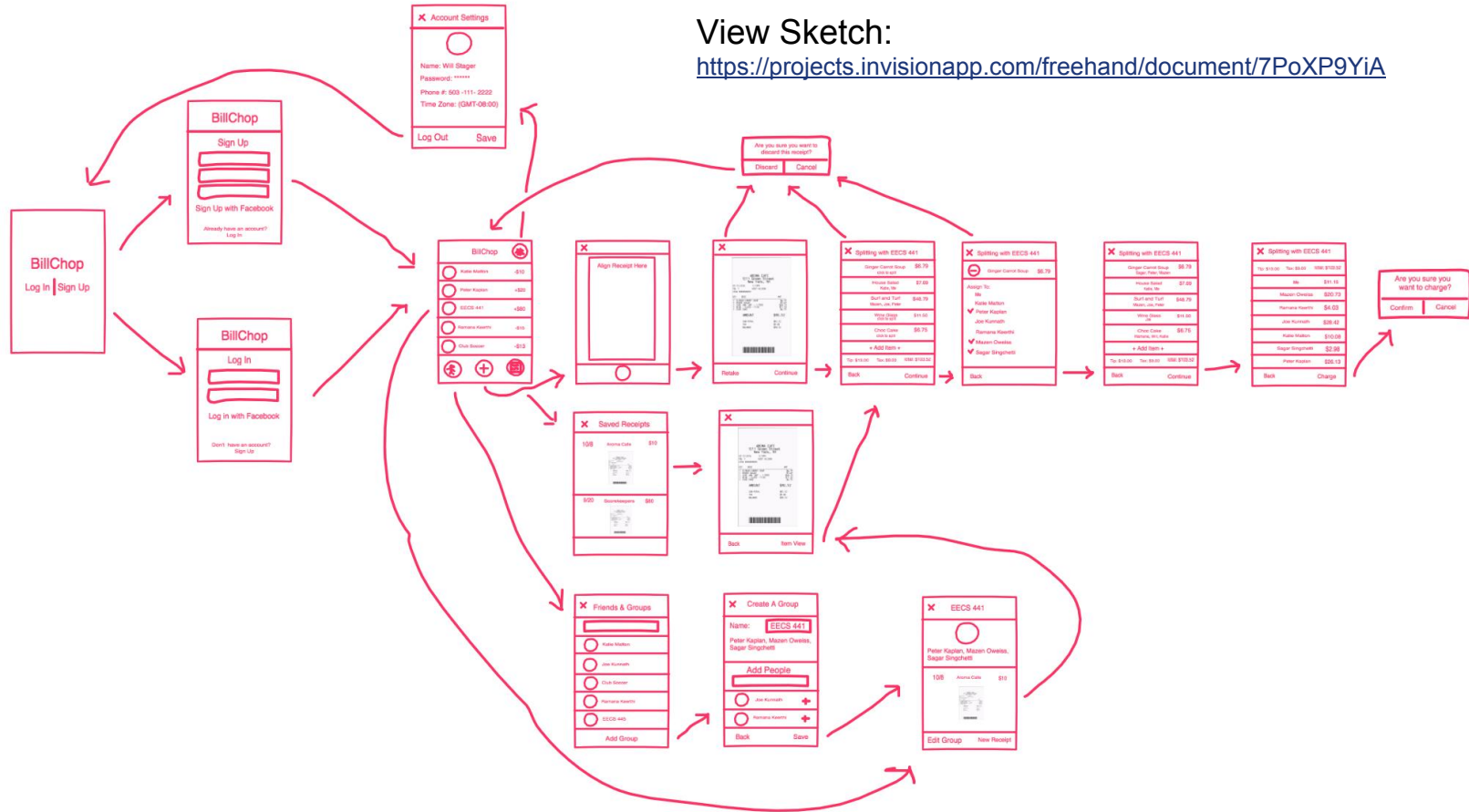


Edit Group New Receipt



View Sketch:

<https://projects.invisionapp.com/freehand/document/7PoXP9YiA>





UX Flow



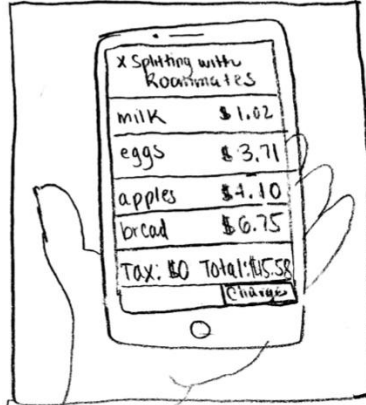
Jordan is a college student who lives with 4 other roommates. As the only roommate with a car, the others often ask him to pick up items for them when he goes to the grocery store.



Jordan purchases items at the grocery store for him and his roommates. They share some items, like apples and bread, and he also buys items for individual roommates as well as himself.



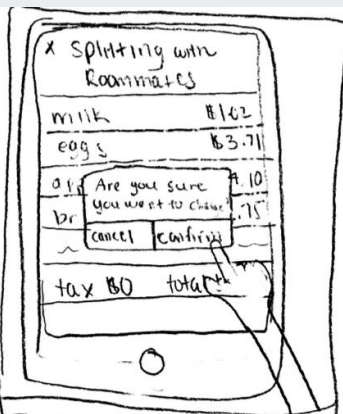
Jordan is on a budget and wants to ensure that each of his roommates pays him back the correct amount. He opens up the BillChop app and takes a picture of his grocery receipt



BillChop automatically detects the items and amounts from the receipt and presents a list to Jordan from which he can tap to assign his roommates to the items they are responsible for.



Jordan taps to indicate which of his 5 roommates are splitting the apples. He does this for each item.



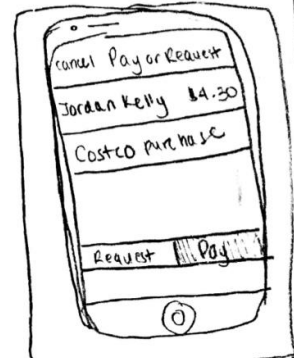
Jordan taps to notify his roommates via text of the amounts they owe.



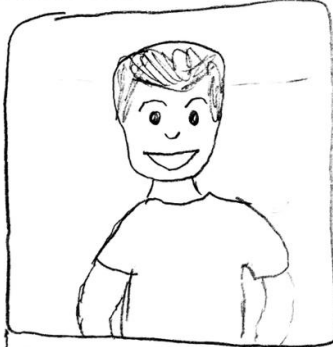
Each roommate receives a text with the amount he owes as well as a picture of the receipt and a breakdown of the costs of the items he is charged for.



Jordan's roommates copy the amounts they owe from the text and pay with their method of choice.



Jordan's roommate George pays him back right away by pasting the amount owed right into the Venmo app.



Jordan is happy because his roommates paid him back right away and he is confident everyone was charged the correct amount.

Usability Test Results Summary (Qualitative)



Pros:

- Most users immediately noticed the button to create an account on the login screen, and were able to navigate through the create account and login process easily
- Users were easily able to retract their steps and go back and redo previous steps if they felt they completed something incorrectly
- Users were able to quickly figure out how to assign and unassign items to people
- Users generally found that it was easy to add, edit, and delete items from the receipt

Cons:

- In general, users found that the style of the app needed the most improvement in order for them to better differentiate various features in the app as well as more efficiently use buttons and icons
- It wasn't clear to users how to add or edit tip in a purchase
- Users were not easily able to identify that they had the ability to add multiple people at a time by selecting groups instead of selecting multiple people individually
- Users weren't able to fully understand what the photo capturing outline feature could do for them, and often had to retake the photos more than once to capture all items on the receipt
- Opening the app for the first to a blank transaction screen confused users

Usability Test Results Summary (Quantitative)



- 80% of users were able to create an account in a reasonable amount time with few clicks
- 100% were able to create an account easily without outside direction after reaching create account screen
- It took 93% of users 1-3 clicks to assign / unassign an item to a person
- 100% can add and delete items in a reasonable amount of time
- 87% of users were able to edit item totals and names easily
- 80% of users struggled to add people to the receipt (didn't click in the right spot, didn't immediately see where to search, etc.)
- 93% of users had difficulty editing the tip and tax associated with the receipt
- 87% of users showed confusion when trying to scan a receipt
- 87% of users hesitated for a significant period of time when attempting to navigate to the capture screen

Numerical Results: Scanning Receipts Screen



- For 80% of participants, 75% + of the items on the receipt were correctly identified after taking a photo 1-3 times
- For 30% of participants, 100% of the items on the receipt were correctly identified after taking a photo 1-3 times
- It took participants between 3 seconds and 10 seconds to reach the receipt scanning screen
- It took 73% of participants 1 click to navigate to the receipt scanning screen; Other participants took 2-3 clicks to navigate to the receipt scanning screen
- Across all pictures taken, on average 80% of the receipt was captured in the photo
- 20% of photos taken included content other than the receipt
- On average, participants took 2 photos before they were satisfied with the photo taken

Numerical Results: Editing Items



- It took participants between 35 seconds and 3 minutes and 15 seconds to start at the home screen and produce an itemized list that they are satisfied with; the average time it took was 2 minutes and 5 seconds
- It took 3 seconds, and 1-2 clicks, on average for participants to navigate from the capture screen to the itemized list screen
- It took participants 1 click on average to edit an item's name and cost (outside of typing in new value); both of these tasks took 1-5 seconds
- It took 93% of participants 1-2 clicks and ≤ 3 seconds to delete an item
- It took participants 3-5 clicks (outside of typing) to add an item to a the receipt; it took participants an average of 6 seconds to add an item to the receipt
- On the itemized list page, it took users an average of 12 seconds between finalizing the list of items and finalizing the totals (tip and tax). Largely, the short time was due to most users not needing to add those values, as users who tried to edit them took as long as 41 seconds.
- Users took an average of 8 taps to edit tip and tax, compared to the expected 4.

Numerical Results: Adding People to Receipt



- For 93% of participants, the amounts owed by each person were calculated correctly. One user noticed that the cents had been rounded in a way so that the total amount owed by each user did not equal the total purchase price.
- Once reaching the person assignment page, 20% of users returned to the itemized list page to make an adjustment.
- It took participants between 20 seconds and 3 minutes and 23 seconds to complete the people assignment page to satisfaction, with an average time of 1 minute and 42 seconds. These times varied greatly based on the number of items and users in the transaction.
- Upon adding a group to the receipt, 93% of users were able to easily assign items to fellow group members within the first two tries
- The average number of clicks on the person assignment page per item was 9.
- The average number of clicks on the person assignment page per person was 7.

Numerical Results: Notification Process



- It took 93% of participants 1 click to notify people of the amounts that they owe after completing item assignment; it took 7% of participants 2 clicks
- It took between 5 and 20 seconds for the notifications recipients to view the amount owed text after it was sent by the receipt owner
- We had 20% of participants go through and mimic completing the payment; for these participants it took 50 seconds on average to navigate to another app and complete the mobile transaction
- It then took the owners of these receipts on average 1 minute and 20 seconds to navigate between Venmo and BillChop to verify that all bill splitting members paid the correct amount

Numerical Results: Modifying Groups



- It took participants between 37 seconds and 2 minutes 48 seconds to successfully create a group with some of their contacts starting off from the home page with an average of 1 minute 13 seconds to complete group creation
- Upon being instructed to select a contact to add to a group, it took users approximately 5 clicks to realize they had to select the green “✓☐” mark on the left side of the contact icon
- The average number of clicks on the group creation page was 11
- 0% of users were able to modify a group after creating it.

Numerical Results: Editing an Old Receipt



- It took 73% of users only one attempt locate the receipt history tab, 26% two attempts, and 6% took three attempts, and a range of 5-30 seconds for the users to do so.
- It took all users one attempt to open up a receipt when asked to do so.
- All users were able to locate the names of the users and the cost associated with the users immediately, taking a range of 3 and 10 seconds.
- 93% of users recognized that the receipts were ordered by date. One user suggested being able to order by highest cost bills.
- Users were able to navigate back to the main receipt history on average in 5-10 seconds and pick out another receipt and read out the correct information of owner, splitters, and items in on average 20-40 seconds

Statistical Summary of SUS Results (1)



- Would use BillChop frequently: 1.22
- Found BillChop unnecessarily complex: 1.33
- Thought BillChop was easy to use: 1.73
- Need support of a technical person to use BillChop: 0.61
- Found various functions in BillChop well integrated: 1.28
- Found too much inconsistency in BillChop: 1.08
- Believe that most people could learn to use BillChop quickly: 1.33
- Found BillChop very cumbersome to use: 1.42
- Felt very confident using BillChop: 1.87
- Needed to learn a lot before using BillChop: 1.53

Statistical Summary of SUS Results (2)



Total score: 33.5

Percentile Rank: 5%

Grade: F

Takeaways:

- As previously noted, most users were satisfied with the core functionality of the app but felt its style needed significant improvement in order to make the app more usable.
- In a follow up survey, 93% said they would use the app if only styling was improved while core functionality remained the same.

App Design Changes: Overall



- Change design scheme to have more contrast
 - Get rid of blue font on blue background
- Viewing viewing on old transaction, make sure the saved tip, subtotal, tax, and total figures are displayed rather than the default 0 value
- In the edit items and split items screens, make it clear that the tax and tip fields are entry fields by putting them in distinct boxes

App Design Changes: Login



- Give users ability to exit keyboard without submitting login information
- Make screen scrollable so that sign up button is viewable even when the keyboard is up
- Make the sign up option text larger
- When a user enters invalid login information, make the title of the message something more informative than “Alert”

App Design Changes: Home Screen



- When no transactions have occurred, have a message indicating this instead of a blank screen that confuses users
- Include icons on the bottom bar to make navigation between tabs easier
- Make font used in tab navigation bar larger
- Change coloring scheme to have more contrast: remove light blue background from tabs
- Fix boundaries of transaction text boxes that so that the whole transaction title is visible
- Make sure that new transactions appear on this screen right after they are completed rather than after the user kills the app and starts it back up

App Design Changes: Group Functionality



Group list screen:

- Lower “Create New Group” button and change style to make it more visually appealing
- When no groups have been created yet, indicate this so that users know they are in the right screen

Create new group:

- Put search for members button under the “Group Members” heading so users have an easier time finding it
- Make it so you can tap the whole “member” item to add them rather than the little plus sign next to their name
- Make the “Enter Group Name” text entry box more distinct from background
- Allow different users to create a group with the same name (on the backend side don’t enforce unique group names across all users)

View group:

- If there is no history of transactions within the group, indicate this rather than having a blank section
- Enable group editing: add and delete members

App Design Changes: Capture



Take picture:

- Make this the default screen rather than the transaction history screen
- Provide instruction for using the orange box that is displayed to capture a quality image

Review image:

- Add capability to zoom in and crop image
- Instruct users to crop image so that only the listed items and totals are part of the receipt
- Display loading icon after user presses “Continue” button, so that they are aware that the receipt is being processed

Receipt capturing functionality:

- Expand parsing algorithm to account for more receipts
 - Scorekeepers receipts

App Design Changes: Splitting Receipts



- Make the split with friends button more prominent, so that users have an easier time finding it
- Change the wording of the button so it is clear that this also how you add groups to split with
- Currently when the search results appear they take up the whole screen, so users can't tell if someone was successfully added or not
 - To fix this, either show added members on top of search results or clear the search screen to show the list of members after someone is added
- When a user hits “notify members of amounts owed,” add warning message if not all the items are accounted for
- In the amount owed notification message include a picture of the receipt as well as the name of the person who is owed