

# Project Introduction



**Problem (pain point):** University off-campus housing.

It is often difficult/stressful to find affordable and available housing options for college students. Oftentimes, once the first year of undergrad is over, students are no longer guaranteed on-campus dormitories - resulting in a frantic search for available housing through a chaotic string of third-party websites/word-of-mouth.

Many of these offers also have logistical problems: contracts starting too early in the summer when the student is away from school (resulting in wasted money), renting with unknown tenants, lack of furniture/internet/appliances undisclosed, etc. In general, there is a lack of information before entering a rental agreement.

There has to be an **easier** way to secure off-campus living!

# Our Idea (solution)

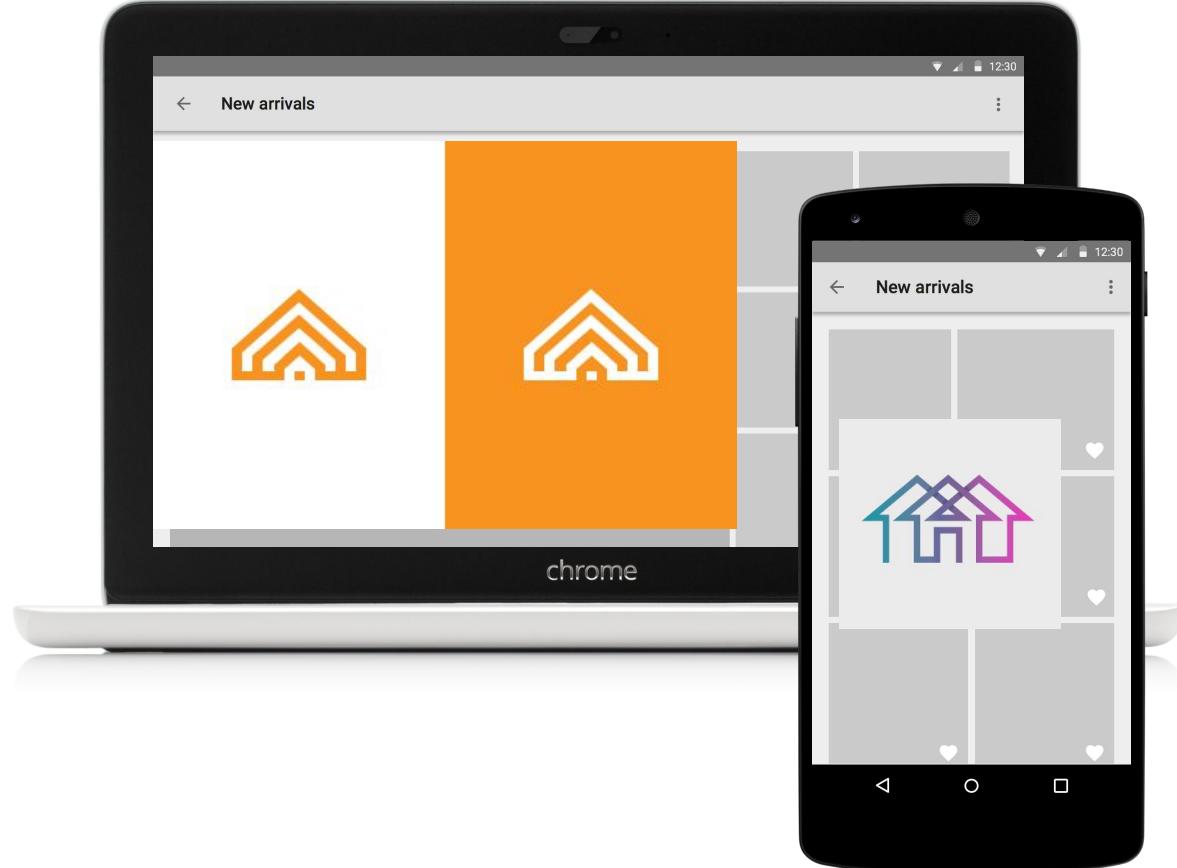


Our **goal (business solution)** is to create an app which consolidates information about open houses/apartments in an accessible way to both students and realtors/renters. This program (*think Yelp for housing*) will integrate several key features:

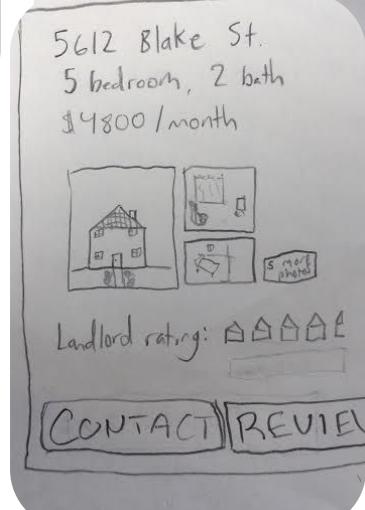
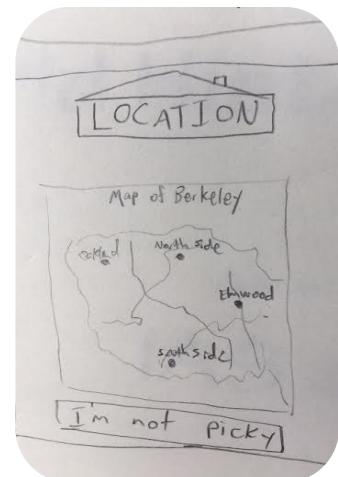
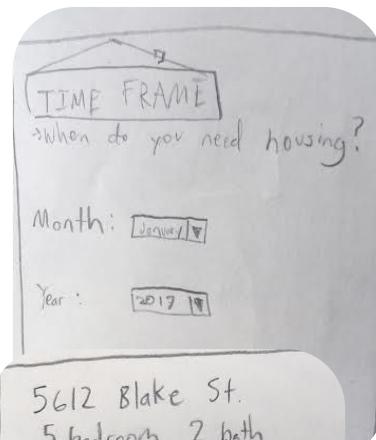
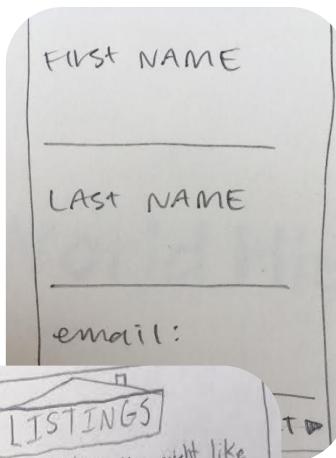
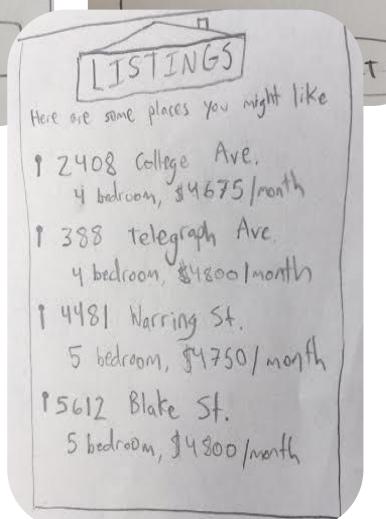
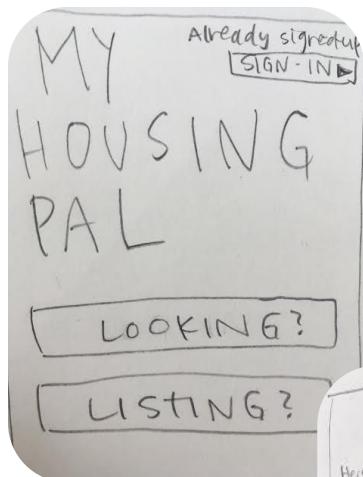
- Reviews from past tenants about the landlord, maintenance needs, etc
- Student authentication (i.e. Berkeley email/calnet required for credibility matching). This ensures tenants can know each other beforehand and acts as a security measure.
- Sort by: the number of people for the rental (looking for 1 person? 2? group?)
- Chat feature to possibly communicate and share interesting listings among friends
- Categorized listings by price, distance, size, etc.
- Possible hardware extensions to app:
  - QR code or stickers for the renters (to put on window/house so people can scan to learn more info. about listing on the app using their smartphones)
  - Some kind of smart button - press to know how many people have viewed a listing, liked it in person, etc.

# Prototyping 1.0

- Iterating on our design on various devices
- Our low-fi prototype was made using PoP for smartphones
- This stepped through the major features we wanted to include in the app in order to interview and complete preliminary **market research**



# Prototyping 1.0 & Market Research 1.0



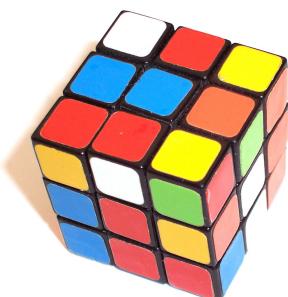
# RIC #1

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1. **Opportunity Recognition:** *No core platform exists to connect with other Cal/college students and find off-campus housing easily*
2. **Solution Selection:** *Smartphone apps are popular and easy to use. We have seen the success of apps like Yelp, could we create an app like this for renting houses?*
3. **Market Experimentation:** *We'll conduct market research and surveys (i.e. Google Form) to see how other Cal students like this idea. We can provide a mockup app to facilitate the decision-making process.*
4. **Experiment Results:** *To be obtained...results will then drive future iterations/modifications to the solution process (final product)*

# Challenges:

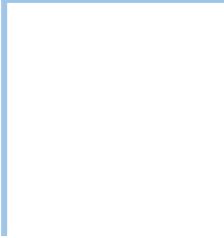
Users/who pays for our app:

- In order to create a consolidated platform, we need to attract users. This means that our business model cannot initially expect students to pay for the app.
- Monetization might be done through advertising, or for a transaction rate (charged to renters once a listing is closed - using the app to advertise their houses)
- Getting schools to make the app “official”



Technical difficulties:

- Deciding how refined we want the actual product (deliverable for class) to be; programming and UI/UX design
- Finding a way to tie into existing services: Google Maps API, sharing interesting listings through social media/Facebook, etc.
- Staying on-track (limited time) for market research and prototypes/iterations



# RIC Round Two



My Housing Pal

# RIC #1 [Recap]

## I. Opportunity Recognition

Platforms do exist, but none of them effectively solve our problem: No effective medium for connecting previous, current, and future student-tenants with inside information on things like the landlord or the property itself.

## II. Solution Selection

Website, an in-person on campus service, or an app; we decided an app accompanied by a landing page would be most effective

## III. Market Experimentation

We're collecting data on our target to find out what they value in the housing search process, and how important they think features like landlord ratings, previous tenant reviews, etc. would be. We are also collecting data on our App prototype, assessing ease and function of use.

## IV. Experiment Results

\*Still in the process of collecting survey results and user testing results\*

\*We realize this might cause later changes to our RIC, i.e. another iteration.

# RIC #2

## I. Opportunity Recognition

As aforementioned we are hoping to build a scalable business. The beauty of this is that we've planned out a series of hardware extensions + partnerships which can take us further than just a smartphone app. If we actually start this business, the application is where we'd begin. However, for the purposes of this project, we have also recognized other opportunities (website, interactive element to rentals/sorting data by hardware technology) and built/iterated through these options. Over the next few slides, we will introduce you to some of the opportunities we have identified + our rationale.

## II. Solution Selection

Customers are both students (looking for housing) and sellers (renters). Business model A-B testing explained in slides below.

## III. Market Experimentation

Market experimentation was performed in at least six different methods/channels. This includes: 30 new face-to-face interviews with students looking for housing, online survey for Berkeley students looking for housing, direct email/LinkedIn contact for partnerships + collaborations +advice, direct contact of sellers hoping to rent their house, exploration of opinions on our hardware extensions, testing popularity (A-B) of business through social media and refinement of our questions, etc. These are documented in details in the next few slides.

## IV. Experiment Results

Analysis of our current results and data demonstrating the problem exists, is covered in the slides below.

# Business Model A-B Testing

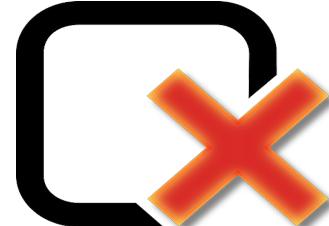
*Business model A-B testing models:*

We discussed with students and landlords as part of round two of our market experimentation:

- 'x' percent of sale when deal closed
  - **Industry standard rates: this is most receptive option found via this A-B testing/discussion session;**
- Charge fee for app usage on seller side (renters as a form of advertising)
- Charge fee on student side
- Charge through schools/universities/advertising
- Charge by selling valuable hardware as add-ons, etc.

For distribution of surveys/sample website, we also looked at AdSense

- After launching our product, we'll use social media + word of mouth marketing;
- Already contacted:
  - Aim: partnerships w/ UC housing website services
  - Display our app and information on their website
  - Allows students + parents to see this info. easily
  - 97% of students contacted said looking for housing is stressful
  - 80% of sellers would consider using our service



# Market Experimentation 2.0

We reached out to:

- Berkeley (CalRentals)
- Trulia
- Craigslist
- TheRealMLSONline.com
- Landlords

- We are waiting to hear back from several of these platforms;
- Sellers did respond: "If the app is widely used by students, I'll use it for sure."
- Distribution/getting this market penetration + unity seems to be the biggest challenge

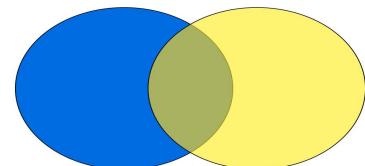


Response rate:

- 54% for sellers (renters/companies) we reached out to for advice

Demographics:

- Hierarchy of customers using our product as both sellers AND buyers = **massive potential!**



# Market Experimentation 2.0: Interviews



Interviewed current Berkeley student buyers looking for housing next academic year by showing them our software/design prototype iteration and some general questions. Interviews were performed at the Units (dorms - first year students who must look into off-campus housing soon).

- Interviewee 1: 18-year old, Economics major/Math minor; undergraduate student
- Interviewee 2: 18-year old, intended-Haas and Psych major, undergraduate student



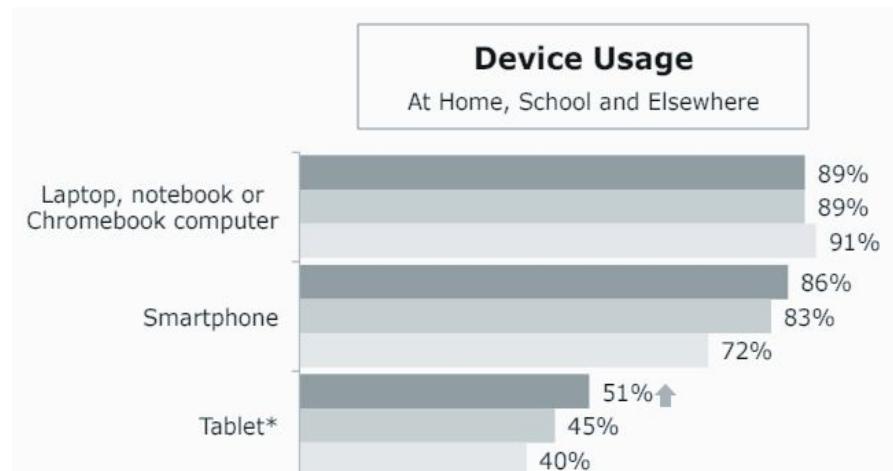
At first, interviewees were hesitant to give honest answers. Using a 'Laddering' technique we uncovered insights →

- *"Would you use this app for housing if it consolidated all off-campus options in a manageable way?"*
- *"How important is the social interaction factor the app? Would you pay to use this app as a buyer?"*

# The Case for Mobile

1. "Yep, I tried looking on Craigslist and Trulia for renting apartments off campus, but the options are limited...yeah, I used my **phone** to do this since I can share links with friends on Messenger or Facebook."
2. "Nine in ten college students use a laptop or smartphone on a regular basis." - Pearson 2015 Study

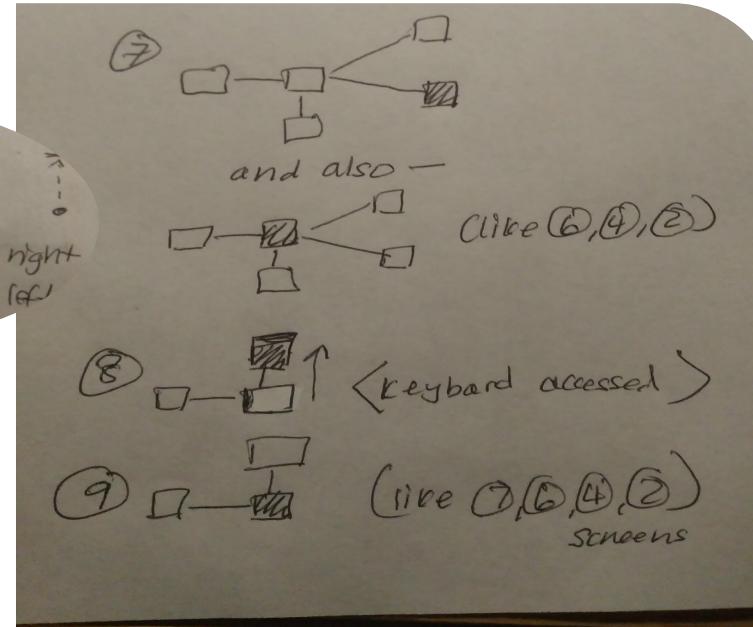
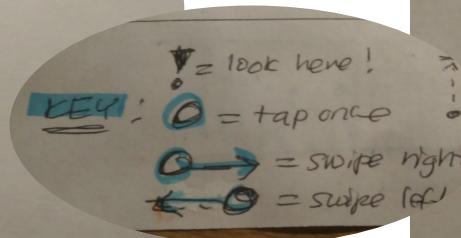
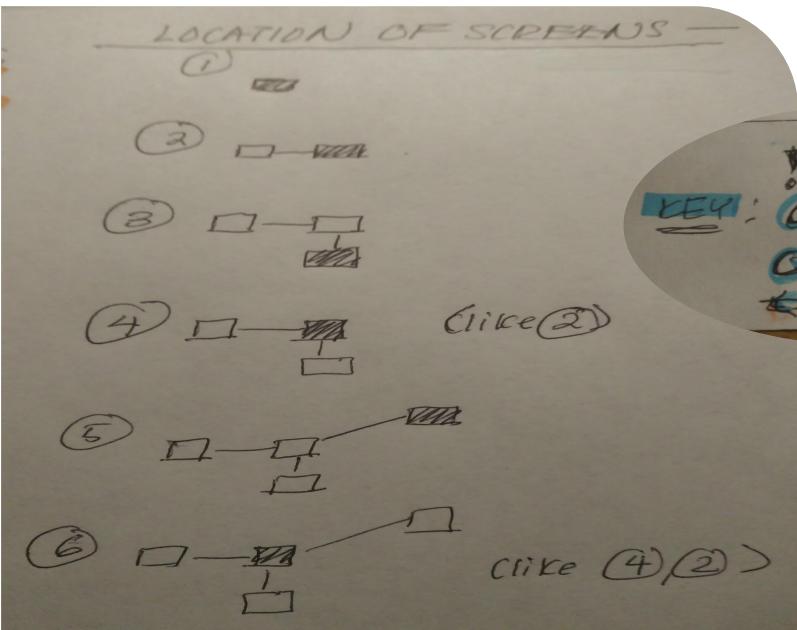
➡ Deciding to focus  
on **smartphone**  
**app** with secondary  
**website** as a companion  
and/or bonus feature for  
laptop users ⇔



# Visual-Spatial Screen Navigation Maps of Mobile Prototyping

Used in our paper prototype of app version of product for **navigation clarity**

Maps make the **interaction across screens** of an app easier to visualize (connections) without a refined prototype  
Shows connections between our initial screens before we refined the PoP and Photoshop versions of real app



Next: Our prototyping process for  
considering what questions to ask on survey  
1.0 + hardware extension products

- Completed/refined according to A-B  
testing (respondents unwilling to share  
some info, but not other questions, etc.)  
based on trial and error!

## Survey Questions (first iteration brainstorming draft)

### 1) What Year are you?

- a) Freshman
- b) Sophomore
- c) Junior
- d) Senior
- e) Grad (Masters/Doctorate)

### 2) Are you a Male or Female?

- a) Male
- b) Female

### 3) How did you find the current house/apartment you're living in?

- a) Through a friend
- b) Online
  - i) Website: \_\_\_\_\_
- c) UC Berkeley Housing (Calrental)
- d) Other:

### 4) Where are you living?

- a) Apartment
- b) House
- c) Fraternity/Sorority
- d) Co-op
- e) Commute from home
- f) UC Berkeley Dorm
- g) Other:

### 5) How many people do you live with?

- a) 1
- b) 2
- c) 3
- d) 4 or more

### 6) How well do you know these roommates?

Rating: 1-5

### 7) How long is your current lease?

- a) 6 months or less
- b) 6 months - 1 year
- c) 1-2 years
- d) 2 years or more

### 8) On a scale of 1-5 how satisfied were you with the amount of information about tenants/owners beforehand?

### 9) On a scale of 1-5 how frustrating was getting your housing?

### 10) On a scale of 1-10, how good is your relationship with your landlord

### 11) How much time did you spend looking for the rental/house?

- a) Under a week
- b) 1-2 weeks
- c) 2-4 weeks
- d) 4-8 weeks
- e) 8 weeks or more

### 12) What was/is the biggest struggle with finding your current rental?

(text box)

### 13) On a scale of 1-5 how satisfied are you with the pricing of the rental/deal?

### 14) How much are you willing to pay to use a easy/safe housing rental service? \_\_\_\_\_

### 15) Is there any additional information you want us to know?

(text box)

# Raw Data Sample [Survey 1.0]

Time stamp	Name	Contact Info	Occupation	Off-campus housing?	Pay for service?
2/14/2017 0:46:43	Elizabeth	eafernandez6@berkeley.edu	Student	Yes	No
2/14/2017 14:18:12	Vincent	vincent.oddrepublic@gmail.com	Student	Yes	Maybe
2/14/2017 14:30:42	Michael		Student	Yes	Yes
2/14/2017 16:56:09			Student	No	No
2/14/2017 17:03:00	Austin	apwright@berkeley.edu	Student	Yes	Yes
2/14/2017 18:18:47	Alvin	Ntuvpa@gmail.com	Student	Yes	Yes
2/14/2017 22:41:17			Student	No	No
2/15/2017 10:24:30	Brian	me@brianrallison.com	Student	No	No
2/22/2017 0:39:43	Erik		Student	Yes	Yes

# Survey 3.0: goo.gl/Zexjsh



## UC Berkeley Housing Survey

UGBA 190T Market Testing

Your email address ([victorx@berkeley.edu](mailto:victorx@berkeley.edu)) will be recorded when you submit this form. Not you? [Sign out](#)

Name:

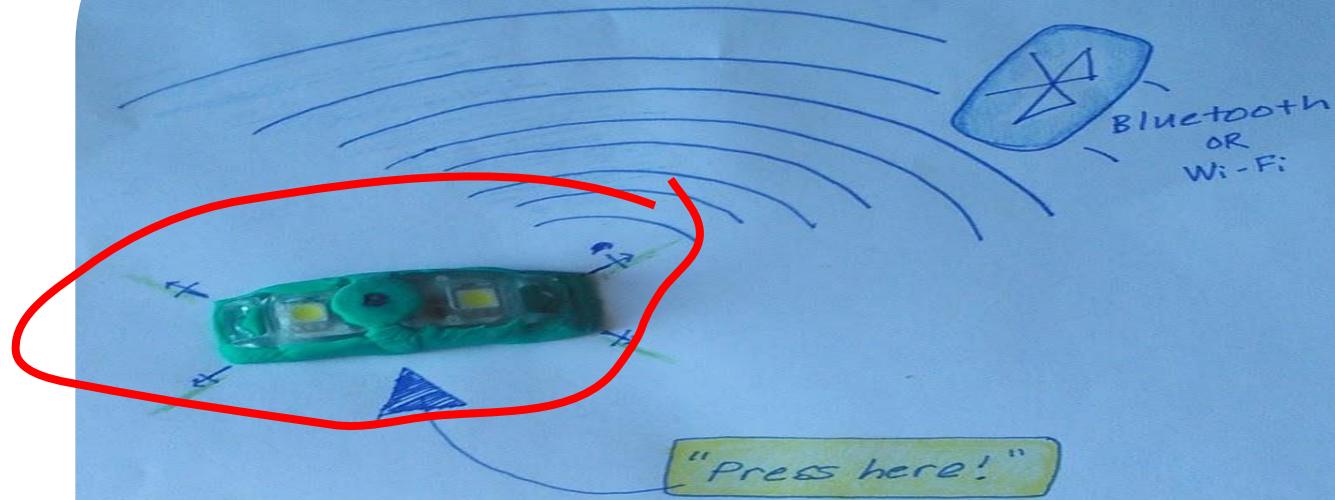
Your answer

Year:

Freshman

- 3rd generation, refined survey for students with **hyphenated** link for distribution among our social media networks + shared on websites
- Shared on various platforms, forums (Reddit/berkeley) to increase viewership
- Realization that for absolute strangers, it is difficult to get people to complete survey w.o. Incentive
  - Over 310 views - only 1% responded completely
  - Learning lesson moment

# Hardware Extension (scaling) 1 : 'click' Prototype



Hardware Prototype 1 -  
**2nd generation** iteration fabricated by us

'Smart Click' button  
Shows likes/views for a listing  
Well-received by sellers we asked and contacted. Would use as part of 'package'

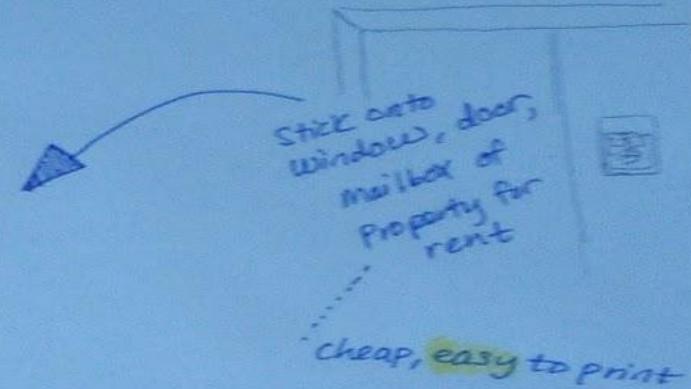
## — Features —

- + connects to phone via Bluetooth or Wi-Fi
  - + viewers press to show how many people have viewed or liked a listing
    - ↳ integrate w. app to sort listings by popularity
  - + low energy consumption
- Placement : Front door, kitchen coun etc.

# "How does the hardware prototype 1 interact with the main app?"



## Hardware Extension (scaling) 2: Awareness QR 'smart' Tags



- Hardware prototype 2 - 1st generation - physically printed and customizable, well received by both students and sellers
- Scanning this code with a phone actually takes you to our demo website - try it!



### — Features —

- + Scan w. app on phone to instantly learn more about listing → photos, ratings, etc
- + spreads brand awareness  
+ allows people to recognise property for rent

# Website Prototype - Works in conjunction with app

MYHOUSINGPAL

[HOME](#)   [SERVICES](#)   [ABOUT](#)   [CONTACT](#)



# Let's find you a place in Berkeley.

## Welcome to MyHousingPal

With our app, you can find a place to live based on your specific preferences. We know finding housing is usually a pain; that's why we've made it simple and easy.

### Personal Preferences

Our app filters properties based on your preferences including budget, location, pet-friendly, number of rooms, etc.

### Up-to-date Listings

Our team actively reaches out to property owners to find out as soon as possible whether a place will be available for the upcoming school year.

### User Reviews

Past tenants can review properties based on neighborhood, landlord, and quality of living to help you decide on the right place for you.

### Consolidation

With our app, you can narrow down your search to one platform. No need to look through eight different sites to find a decent listing.

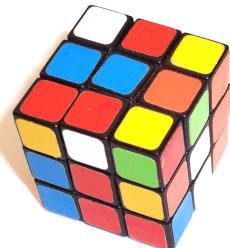
# Analytical observations from RIC#2 process:

Our group has been engaged in the market research + RIC process. Similar to the points raised during lecture, we've asked many strangers/interviewees about our ideas, debated internally (whether the concept is strong enough, **pivoting**, analyzing the data/options), and assigned ourselves **differing roles** (to capture a wider demographic of market research). For example, I used LinkedIn searching to contact freshman students, asking them if they would be interested in our business model (thinking about specifically who to contact for answers). Other team members used varying techniques including: seeking out industry experts/networking, targeting clubs/organizations on campus for questions, using **social media** to test the market response, etc.

Our team will apply these concepts on **positioning/customer value propositions** to refine our **customer persona** and explain what makes our business different from pre-existing solutions on the market; putting ourselves in the same position as the customer to think through multiple perspectives. We have already used Google to examine similar businesses, '**twisting**' our concept in new directions through biweekly meetings. Being aware of factors such as churn rate and costs of customer retention/services will also guide us to a more polished business plan. Knowing the channel type allows us to form **long term considerations** and the future stickiness of the business.

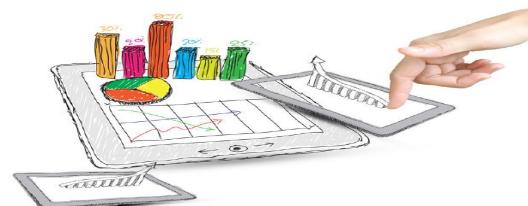
# Challenges 2.0: Failed Solutions

- ❖ Website:
  - *Mobile is often more sought out and easier to access, so we thought we could incorporate a landing page that goes along with our app, but not have it be the central method*
- ❖ In person service, similar to a broker's office:
  - *The university already offers a service called "Cal Rentals" - although it seems that they are willing to collaborate (CalRentals is non-profit, limited awareness).*
  - *If you are searching for housing in early March for example, there are not many properties listed on Cal Rentals. We would do our best to list properties as early as possible to help bridge the gap between the tenant, the renter, and the landlord.*



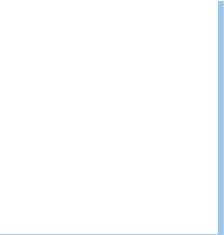
# Challenges 2.0: What We're Having Trouble With

1. Creating a working prototype for both our app and our website considering our limited resources and knowledge (i.e. unfamiliar with software development)
2. Finding a way to integrate existing services like Google Maps, Zillow, API, Facebook, etc. Allowing us to use their data.
3. Deciding which route to pursue for monetization; developing a business plan; limiting our target to only Cal students;





# RIC Round Three [Final]



My Housing Pal

# RIC #3 [Final]

## I. Opportunity Recognition

Mostly unchanged, our final round of survey + feedback data (next few slides) confirms our pain point amid Berkeley students. This makes us comfortable to proceed with the business idea and product.

## II. Solution Selection

- Our mobile app (Android/iOS) became our focus for the final round, as interviewees didn't feel that they would use the website in the context of 'socially' and easily looking for housing. The app makes it easier to scan/integrate our hardware concepts + find housing using features such as GPS/maps
- Along the same lines, we eliminated the use of real estate agents/brokers as possible partners because we realized it's a middle man we can eliminate (maximizing profit in the business model - one time closing fee; both sides) plus most landlords list their homes independently (the reason why selection on Trulia + Zillow was limited to under 20 listings within reasonable pricing around UC Berkeley)
- We also eliminated the 'Smart Click' hardware extension #1 (IoT) device, mainly because it becomes a logistical question of payment/delivery. We will consider introducing it at a future date in our business (scaling). On the other hand, hardware concepts 2 (QR) and 3 (VR) were retained/iterated through because of low cost of production/introduction.

# RIC #3 - [continued]

## III. Market Experimentation [continued]

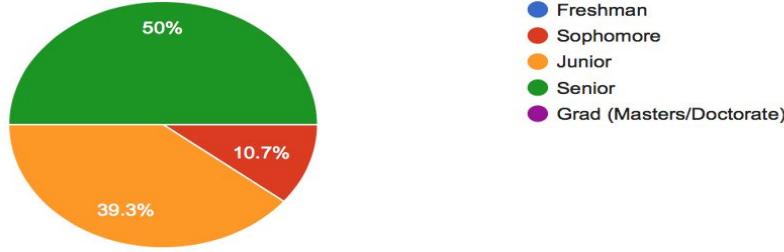
- Finalizing online survey results, testing through social media popularity of our project (posting on the top 2 popular UC Berkeley Facebook Groups)
- Testing the final prototype and getting hands-on feedback from peers/students (interviewed 4 people in person, showed images, online feedback through InVision)
- Data and aggregate results are summarized for students in the slides below

## IV. Experiment Results

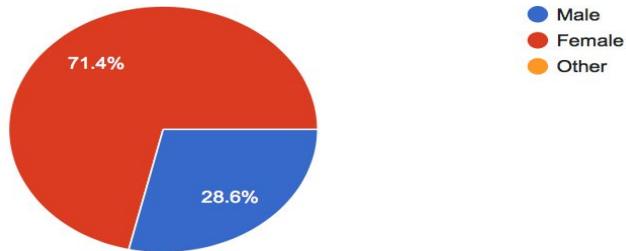
- Customers as the students - willing to pay for the service (direct data) and renters/landlords (if platform reaches a wide audience)
- Service partner - recommendation by universities (without liabilities), word-of-mouth channels
- See below slides for final evidence + analytics on gap/demand of housing service

# Online Survey [Students] Final Data

Year: (28 responses)

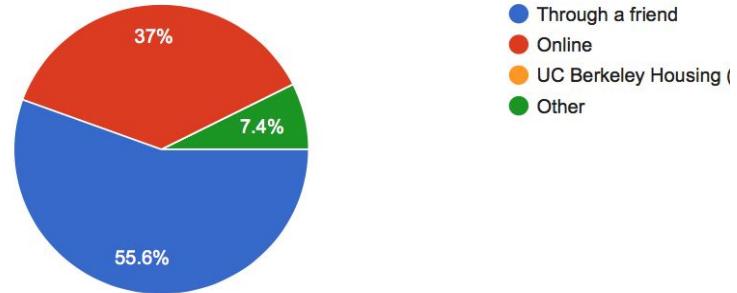


Gender: (28 responses)

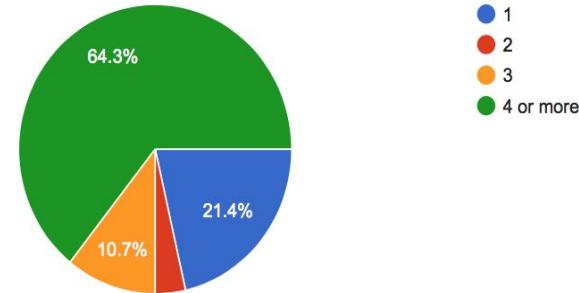


- Our **target** for the app is incoming sophomore and upperclassmen
- Something we should consider is that Graduate students have also expressed similar pain points in finding housing
  - One housing option only for couples
  - Other locations too far away, expensive, cultural barrier
  - UC-option has 2 year waitlist

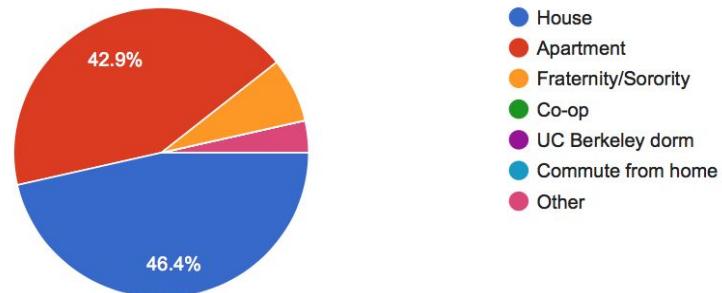
How did you find your current housing? (27 responses)



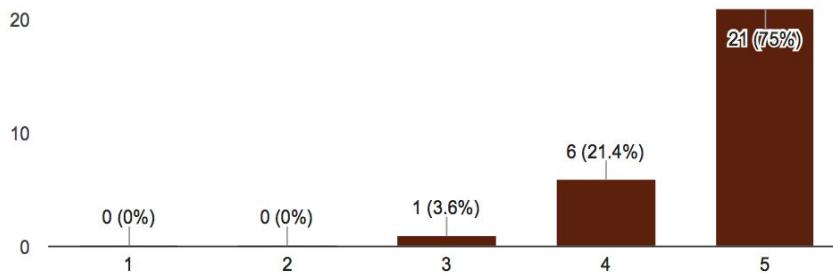
How many people do you live with? (28 responses)



Where are you currently living? (28 responses)

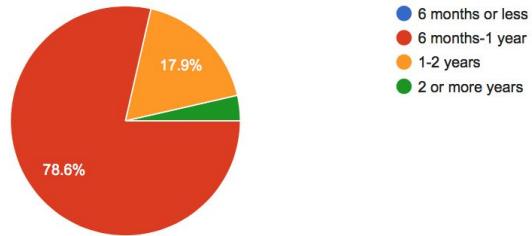


How well do you know your roommates/housemates? (28 responses)



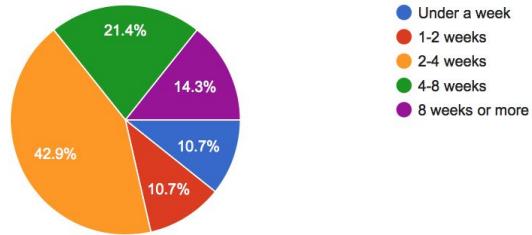
# Data (cont'd)

How long is your current lease? (28 responses)



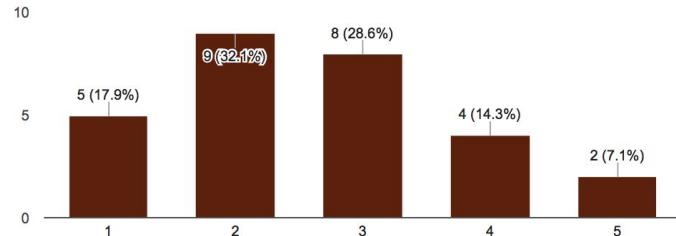
How long did you spend actively searching for your current housing?

(28 responses)

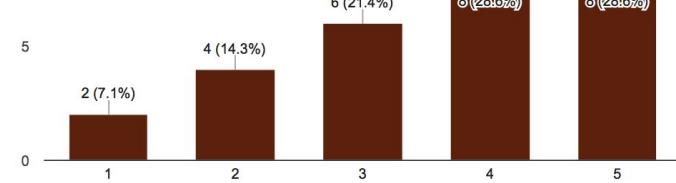


How satisfied were you with the amount of information on owners/tenants beforehand?

(28 responses)



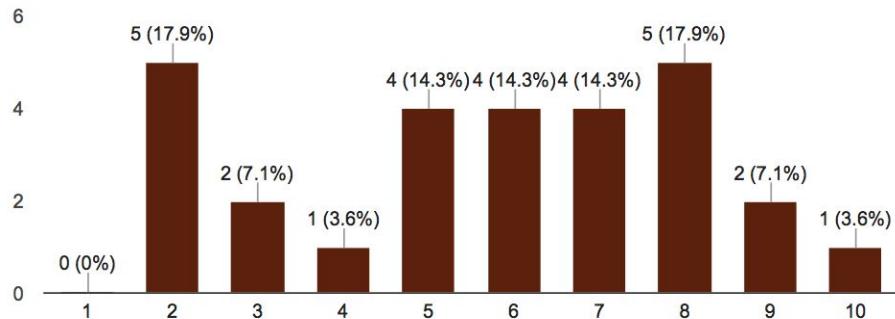
How frustrating was finding your housing? (28 responses)



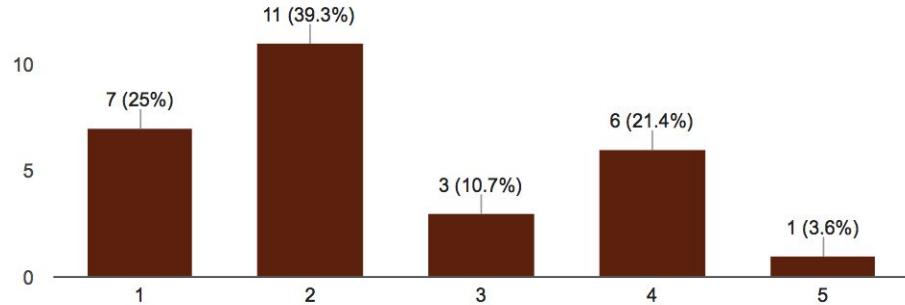
## What was your biggest struggle while finding housing?

- “**Lack of initial formation** about available locations, also **lack of information** about quality of apartment/location, struggled with timing tours, struggled with **coordinating roommates**”
  
- “**Finding something close to campus that isn't super expensive.** Also getting **people** together to fill a larger house”
  
- “**Finding viable places to fit budget and group**”

How good is your relationship with your landlord? (28 responses)



How satisfied are you with your rent prices? (28 responses)



# Contextual Inquiry - Key Points, Quotes:

- ❖ 60% of respondents said they would be willing to pay for this kind of service
  - ❖ 43% of respondents said they would pay up to a \$100 one time fee for a myhousing pal
  - ❖ 5/30 said they would pay a monthly subscription of up to \$15 dollars for the service
- Initial partnership: UC housing services (website)

# Results -- What was your biggest problem?

Problem Type	Respondents Referencing Respective Problem
Finding a place	15
Staying within budget	9
Getting the right amount of people	4
Connecting with landlords/tenants	2
Furnished	1

# Updated: Hardware/Software Extension #3



Scaling & extra pain point: **lack of information** about what property is like

- Feature within app which allows virtual 360° images
- Images are uploaded with details about property which students can view easily
- Compatible with Google Cardboard/VR

“Virtual reality will become  
our new reality”  
*-Forbes*

- Saves time, allows for easier filtering of properties, integrates with existing app + accessible for sellers/owners to create
  - Use existing smartphone to create these images (front + back)

# Final App Prototype [Modified Functionality]

The image shows a hand-drawn prototype of a mobile application for managing rental properties. The interface includes:

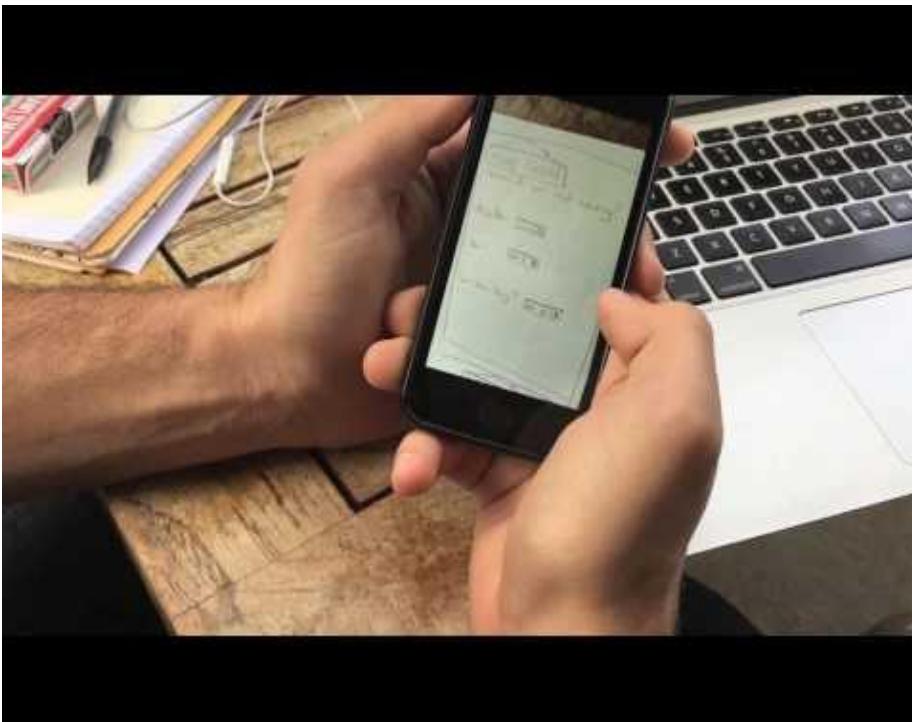
- Search Screen:** Features a search bar ("I search by..."), two address fields ("2609 collage ave.", "2619 Derby St."), and a status indicator ("[status]"). Below the addresses are icons for a house, a building, and a person, followed by a row of four circular icons.
- Profile Screen:** Titled "My Housing Pal". It displays:
  - BUDGET: \$1,000 MAX
  - ROOM: [1] [2] [3] [4] +
  - LOCATION: zip: [map]
  - RATINGS: ★ ★ ★ ★ ★
  - LEASE DATES: start: MAY 2017A row of five circular icons follows.
- Activity Screen:** Titled "ACTIVITY". It lists:
  - Angela Topper: looking for 4th roommate!
  - 6-8 people LEASE ENDS SOON
  - 10-12 people SUMMER SUBLET!
  - 3 vacancies! MAY 2017 - JUN 2018A row of five circular icons follows.
- Tenant Profile Screen:** Titled "ANGELA TOP". It shows a profile picture, the name "ANGELA TOP", the title "senior", and the status "[status]". Below this are sections for "JOHDOE" and "BILLY BOB", each with a small profile icon. A row of five circular icons follows.
- Feedback Notes:** A box titled "Feed back:" contains:
  - change icons to be invite!
  - simplify / declutter
  - start screen Critical launch [set-up] click as either student or landlord / realtor → identification?
- Mobile Device Mockups:** Two phones are shown. The left phone has a camera icon and the text "(default camera phone)". The right phone displays a house icon and the text "2609 COLLEGE AVE", "10-14 tenants", "LANDLORD NAME", "[status]", "photo photo 365 [...]", and "prev / current Tenants:". Both phones have a row of five circular icons at the bottom.

A black Pilot G2 pen is positioned vertically in the center of the page.

# Prototype 1.0

vs.

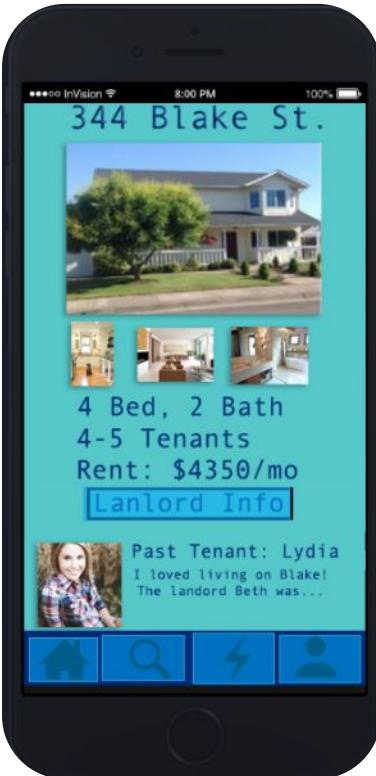
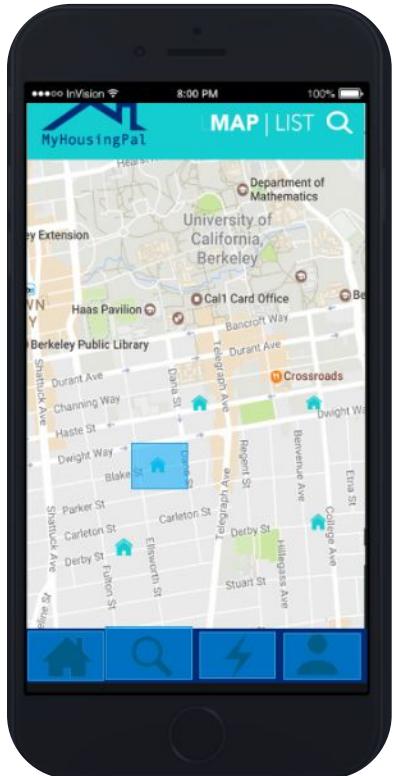
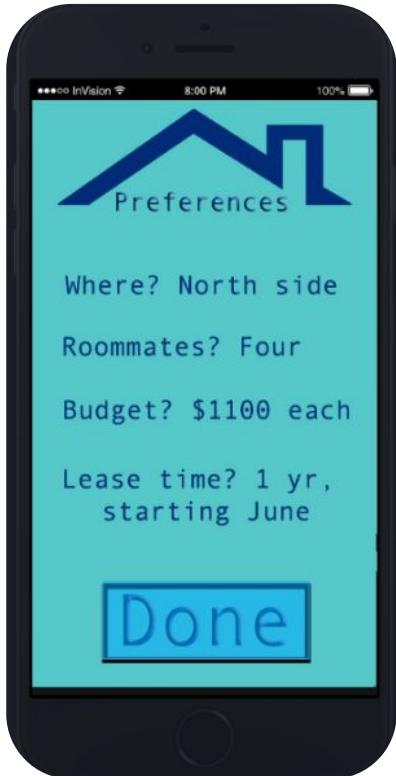
# Final Prototype



Type this link in your iPhone's safari browser to check out a newer, more sophisticated prototype:

<http://bit.ly/2n1Ca8g>

# Screenshots of Final App [1]

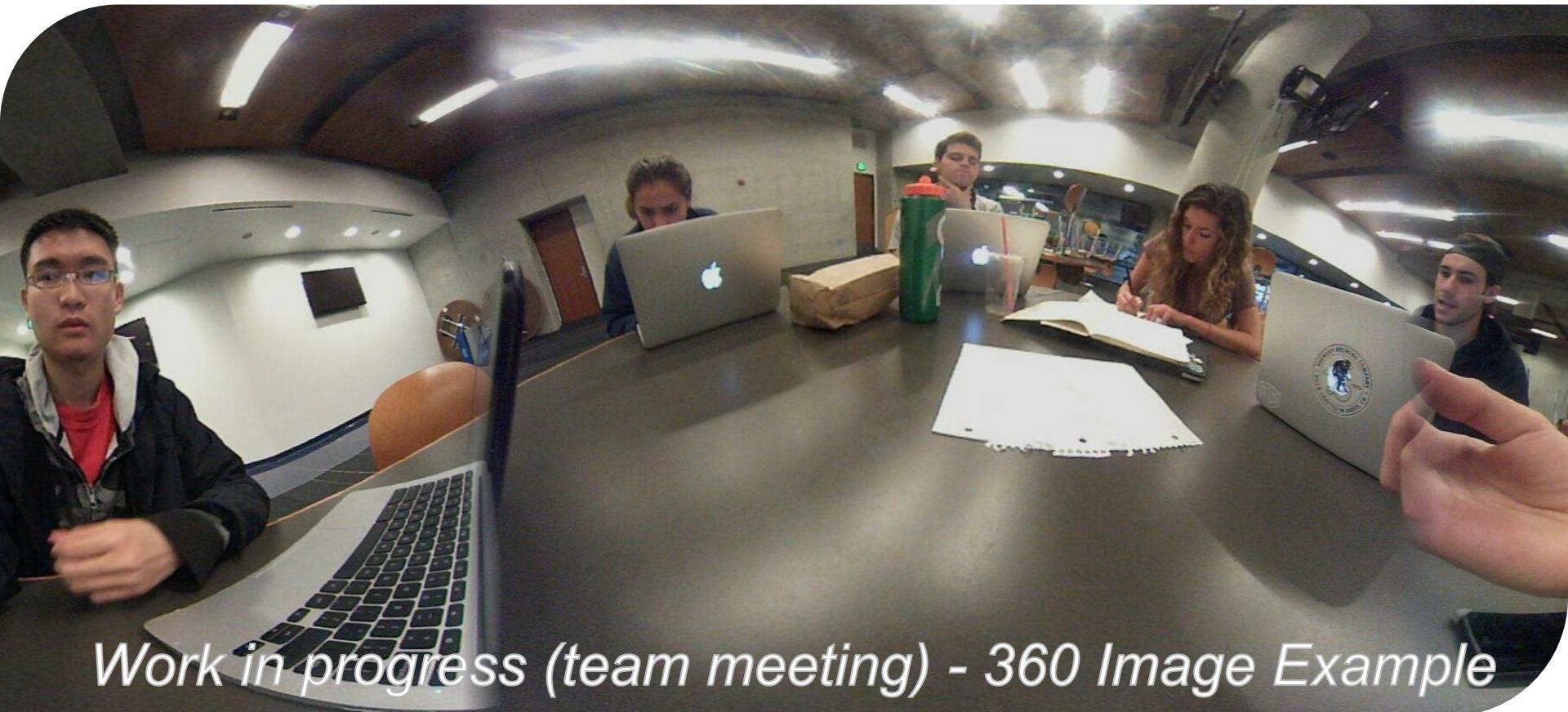


# Screenshots of Final App [2]



- Finalized design implemented after re-considering design/ease-of-use feedback in previous stages [interviews + surveys]
- Final demo showcases the features we have refined + settled on at the end of this RIC cycle

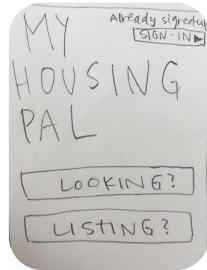
# Who We Are



*Work in progress (team meeting) - 360 Image Example*

# Demo Day: Poster Layout - Working Sample

## Opportunity Recognition

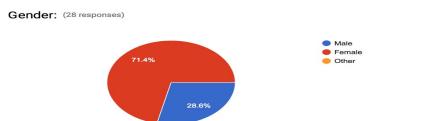


## Solution Selection



## Experiment Results

Problem Type	Respondents Referencing Respective Problem
Finding a place	15
Staying within budget	9
Getting the right amount of people	4
Connecting with landlords/tenants	2
Furnished	1



## Market Experimentation

