SIMPLIFY THE SPREADSHEET

Enhancing Financial and Creative Insights for Maker Entrepreneurs

RESEARCHERS

Courtney Kreitzer & Quentin Romero Lauro

Questions?
quentinrl@pitt.edu
courtney.kreitzer@tufts.edu

ADVISORS

Nik Martelaro, Yasmine Kotturi, Laura Dabbish

BACKGROUND

The rise of the "Maker Movement" in recent years has enabled makers of handmade goods to sell their products for profit. In orrder for these makers to make a sustainable living, they must find their footing not only as craftspeople but also as businesspeople. **Our research goal this summer was to analyze the opportunities and challenges faced by these makers and develop a computational tool to help them become successful business owners.**

Scope

Carnegie Mellon University,
 May - Aug 2023

Task

We participated in a Research Experience for Undergraduates (REU) funded by the National Science Foundation. Our task was to engage in a thorough research design process and prototype a computational tool that could assist maker entrepreneurs in some capacity.
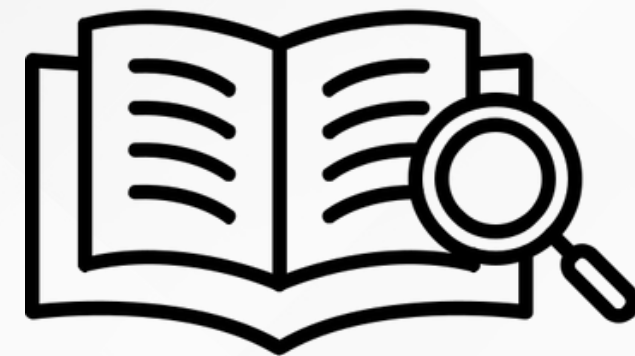
Roles

Courtney Kreitzer - UX Researcher, UX Designer
Quentin Romero Lauro - UX Researcher, Developer

Research Question

What computational tools would help maker entrepreneurs become successful business owners?
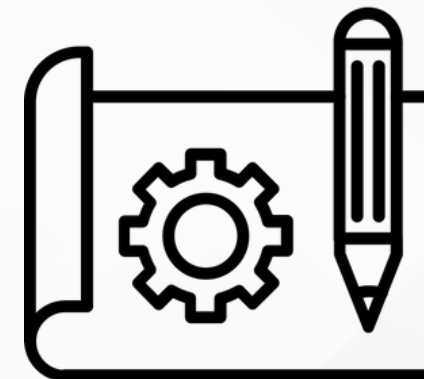
METHODS

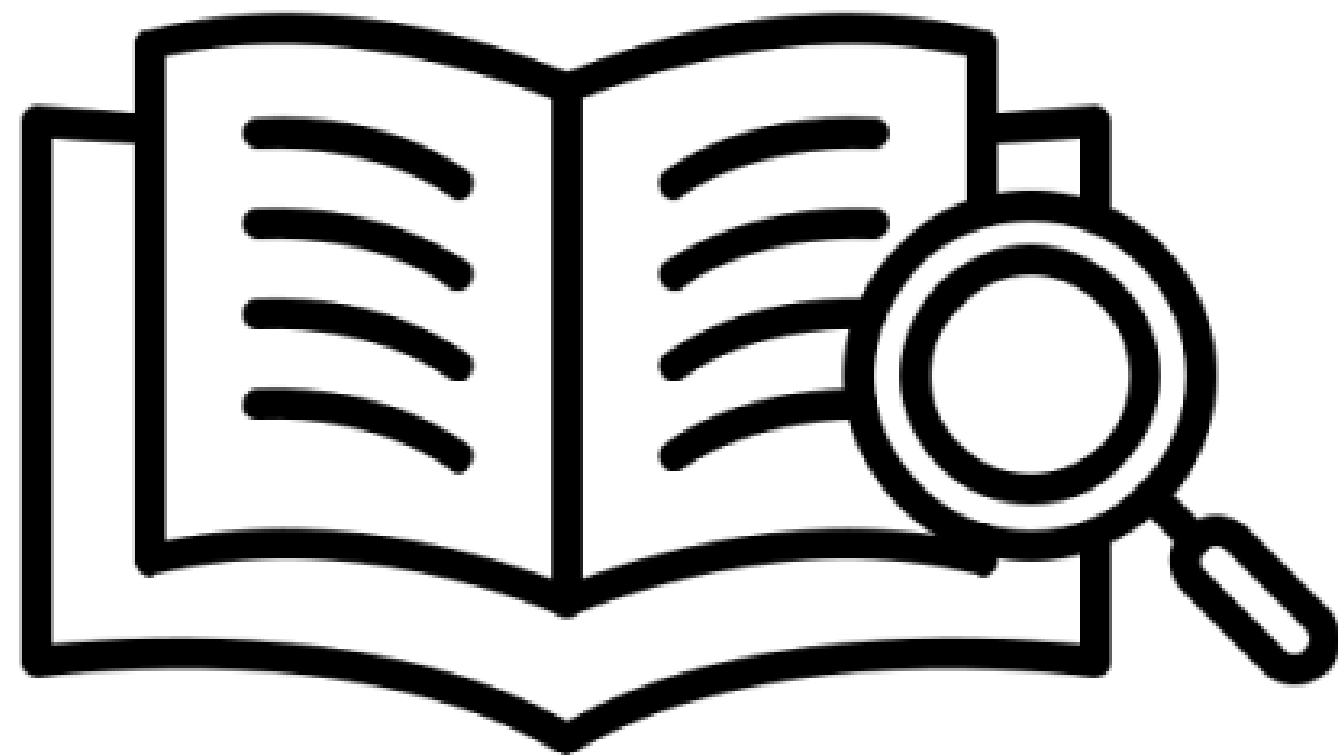Literature Review → Landscape Analysis → Benchmarking → Ideate ↔ Prototype → User Research

LITERATURE REVIEW

LITERATURE REVIEW

In order to gain a thorough understanding of the opportunities and challenges faced by maker entrepreneurs in the digital age, we surveyed the literature. We created a spreadsheet of relevant papers/articles and wrote three-line summaries for each. This lit review was a helpful reference as we started prototyping and were able to rationalize design decisions based on the literature.

LANDSCAPE ANALYSIS
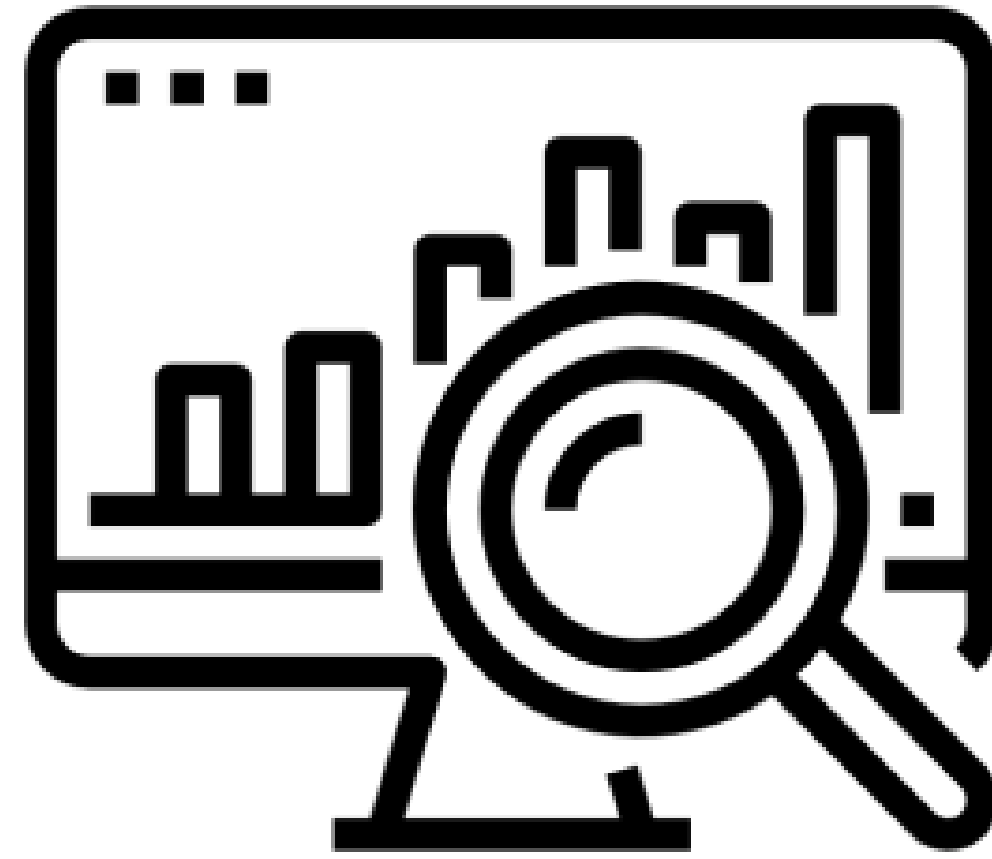
LANDSCAPE ANALYSIS

In an effort to understand what digital technologies already existed in the field, we conducted a landscape analysis. We compiled a list of current tools and explored the features we liked and disliked in each design. This audit was helpful for determining which areas were lean and where there was room for new tools. Additionally, the audit was helpful because we were able to identify features of apps that we liked and implement them in our own design.

BENCHMARKING

BENCHMARKING

Educated by the lit review and landscape analysis, we read and qualitatively coded interviews from maker entrepreneurs that had been previously conducted before we joined the project. Additionally, we spoke with maker entrepreneurs at an art fair. These benchmarking processes were critical in helping us understand the needs of makers on a personal level.

FINDINGS

We found that in order to become successful business owners, maker entrepreneurs must develop a variety of business operation skills while still sustaining the artistic sensibility that engendered their goods in the first place [2]. Many digital technologies exist to help entrepreneurs manage business and finance decisions; however, most makers do not have the time, resources, or training to learn and implement these tools into their business practices [3]. Moreover, few account for the alternative currencies that maker entrepreneurs prioritize such as creative fulfillment and exploration.
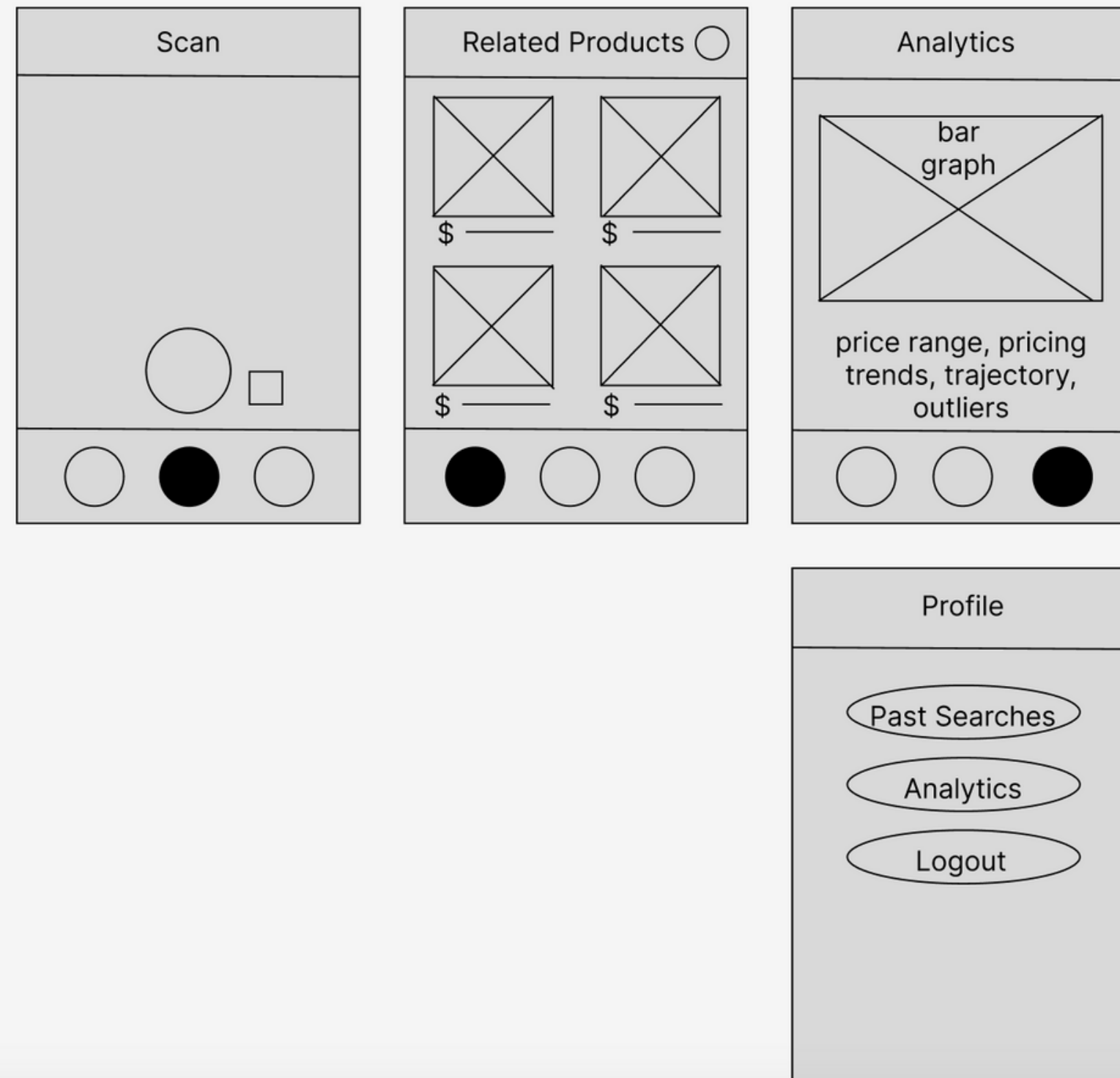
IDEATE

IDEATE

Ideation is an iterative process and we were constantly reappraising our ideas throughout the summer. We began by ideating 30 possible ideas each, then coming together and comparing ideas. Some highlighted ideas include a traveling Makerspace, a socially governed E-commerce platform, an app that helps makers determine how to price their products based on similar items in the field, and an app to swap leftover maker materials.

EARLY SKETCHES
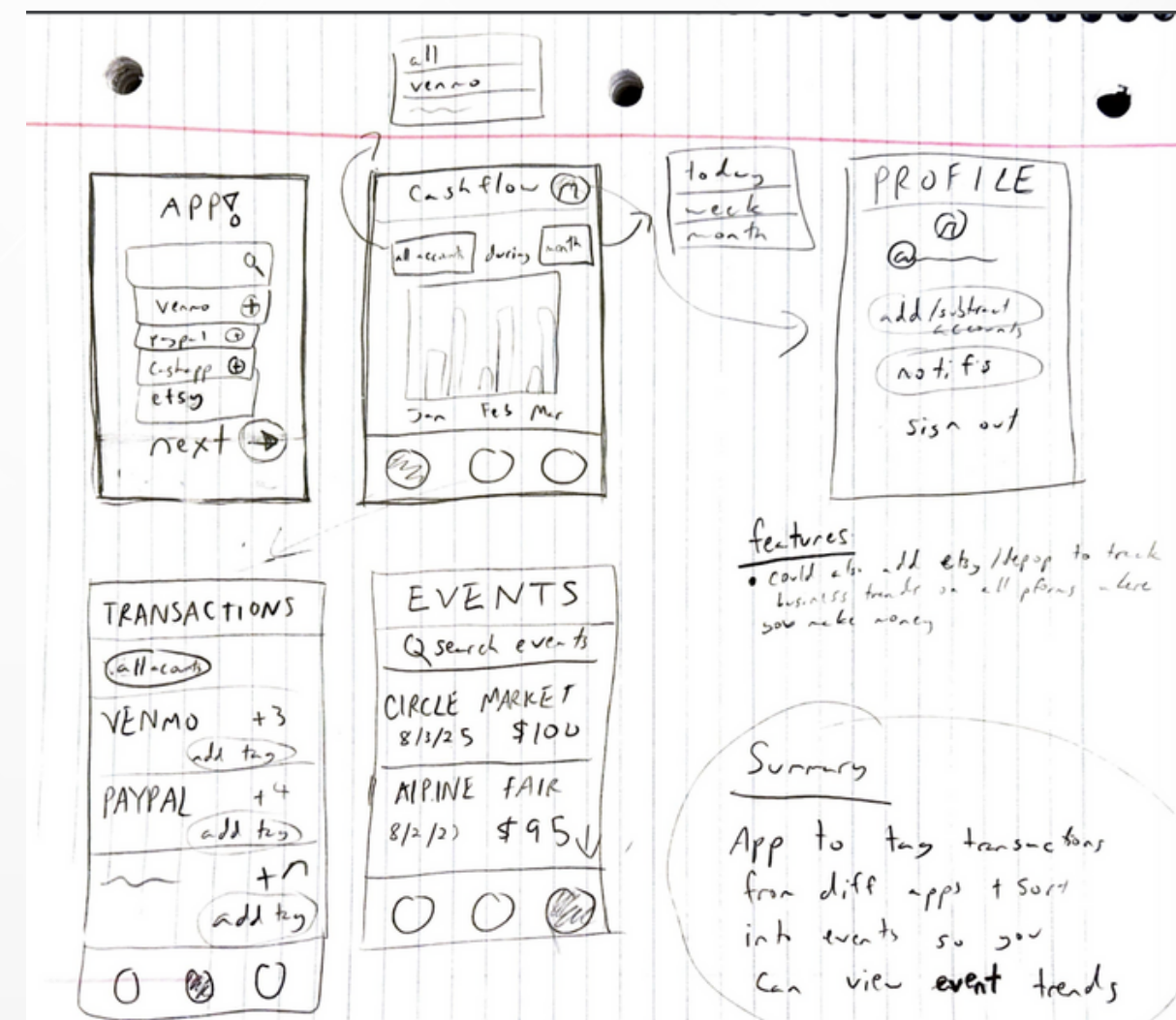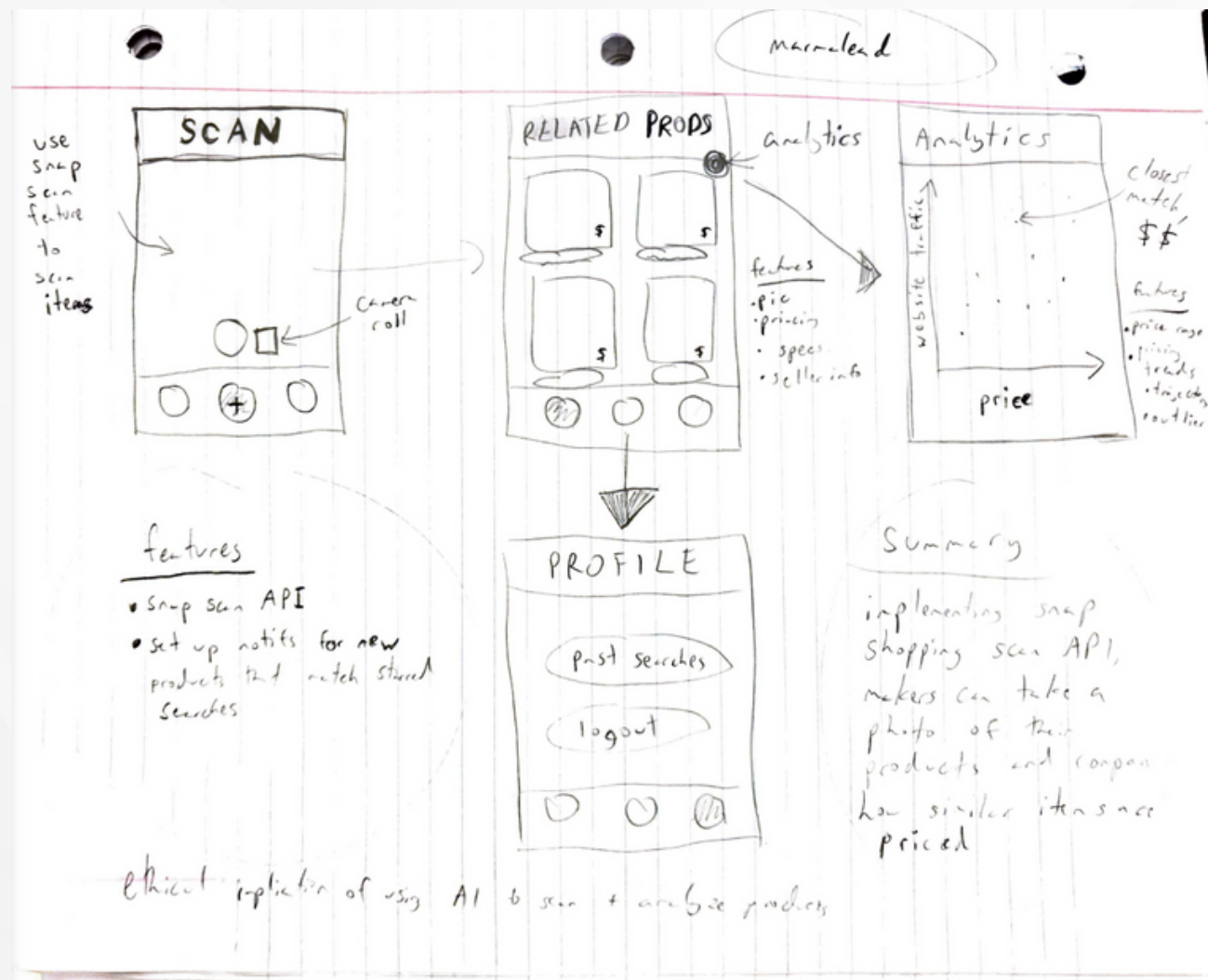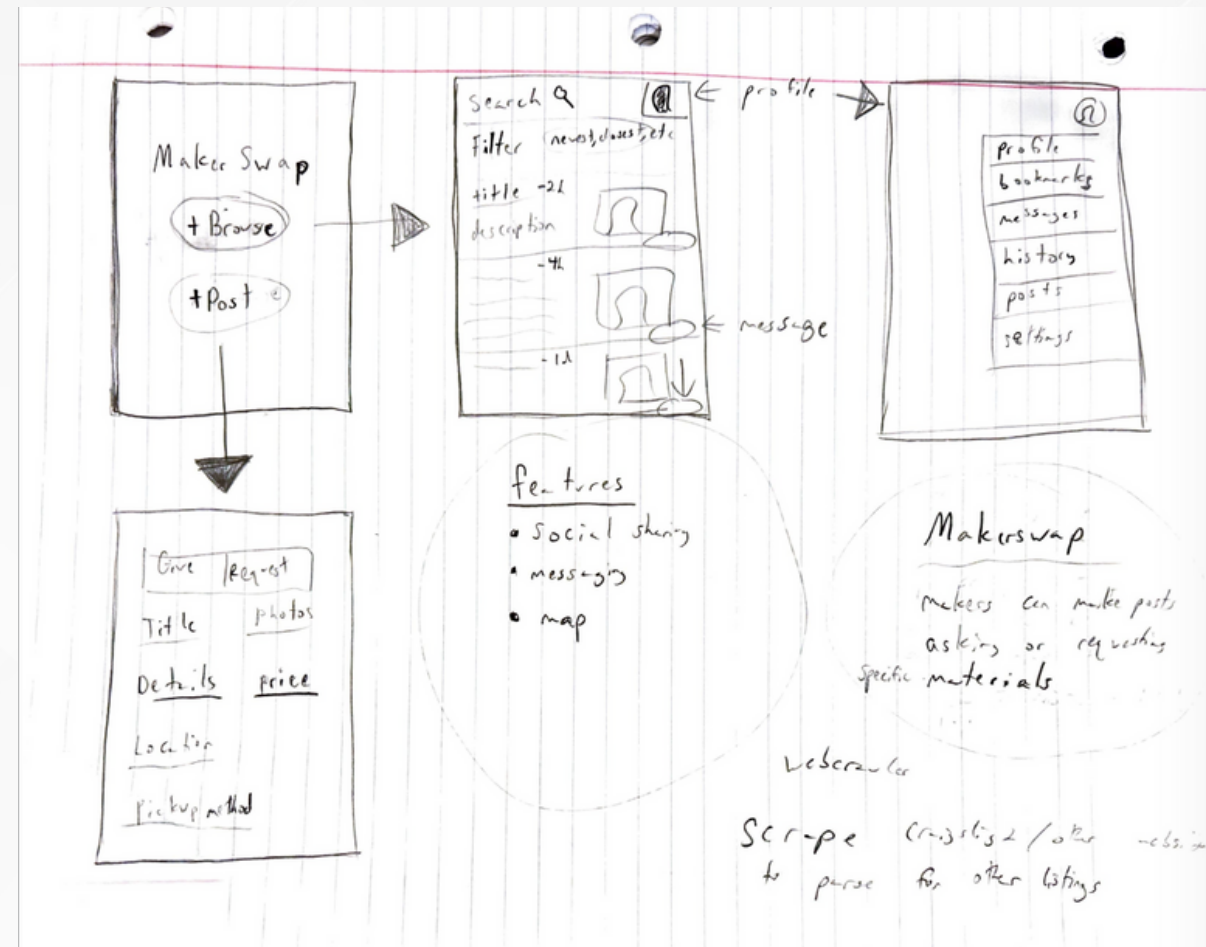
EARLY LO-FI PROTOTYPES

This is an image of my first Figma sketch for an app that has makers take a photo of their product and compares it to items on the market to determine price.

EARLY LO-FI PROTOTYPES

This is an early image of an app idea for a centralized cash app that connects to all platforms where makers are getting money (including venmo, paypal, etsy, etc)

EARLY LO-FI PROTOTYPES

This is an early image of app that allows you to take a photo of your product and put it in a mobile inventory. This idea was later implemented in our final app!
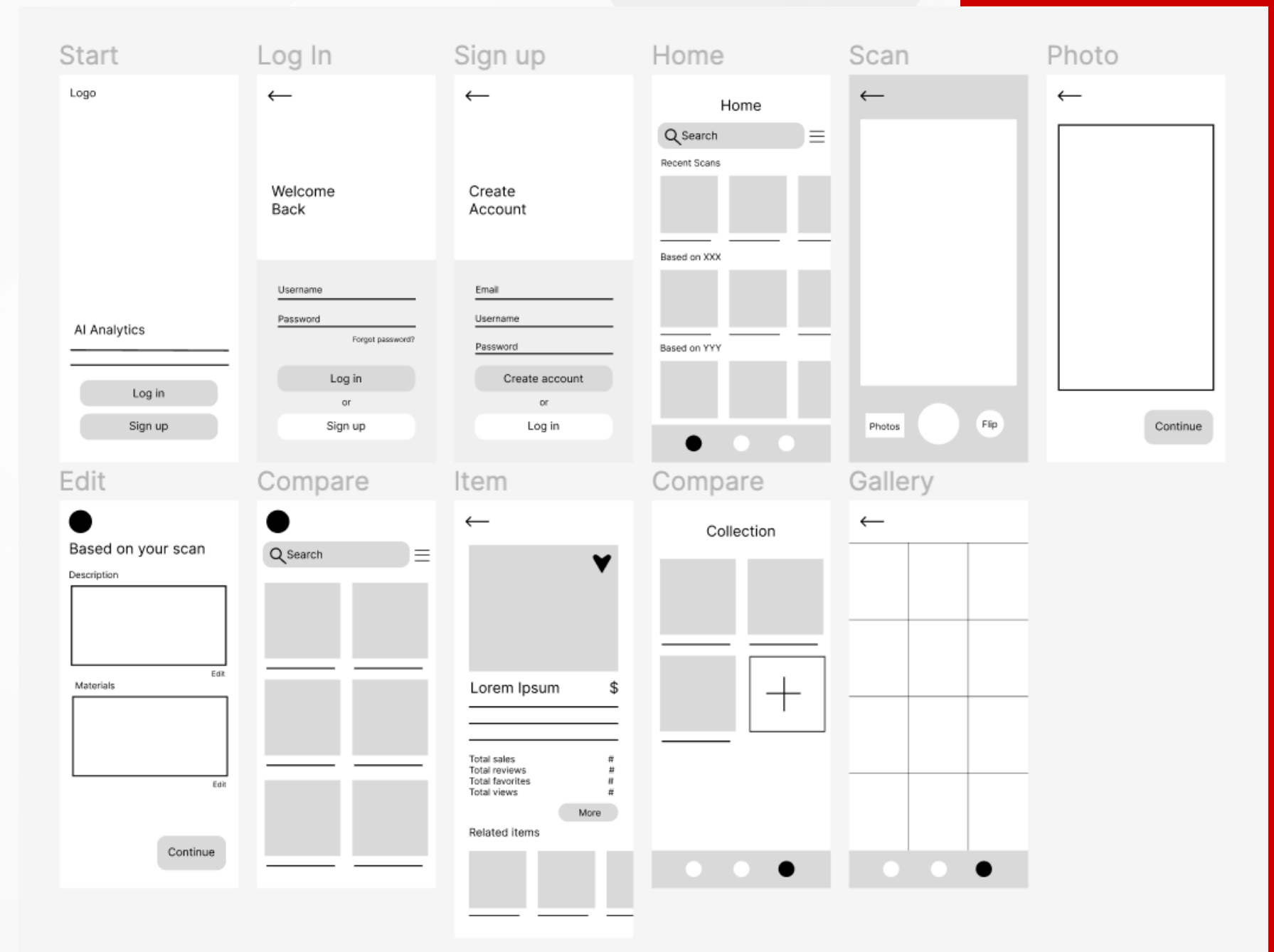
SIMPLIFY THE SPREADSHEET

After a consulting with each other, our mentors, and the literature, we decided to create **Simplify the Spreadsheet**. This tool has maker entrepreneurs take a picture of each product they have made and answer a short survey about their creative process. After creating the product, they can list it on Etsy from the app or manage their full inventory of products. The data we get from the survey and from their linked Etsy account allows us to show makers a visualization of their creative and financial business health. We decided to create a **mobile-based app** [4] because research shows that a rising percentage of Americans use their mobile devices as their main Internet source. We determined that designing a mobile application would optimize the accessibility of the app.

APP FEATURES

1. **INPUT PROCESS**
   a. Upload product and fill out short survey about its creation process
2. **MANAGE INVENTORY**
   a. Easily keep track of all inventory items in one place
3. **LIST ITEMS**
   a. List items on Etsy, where makers hold an online presence
4. **TRACK KEY METRICS**
   a. Visualize the big picture of financial and creative well being

RESEARCH QUESTIONS

- What are the key challenges and benefits for maker entrepreneurs using current business tracking technology?
- What kind of visualizations help maker entrepreneurs make better business decisions?
- How can we collect career fulfillment data from maker entrepreneurs and what does it tell us about them?

PROTOTYPE
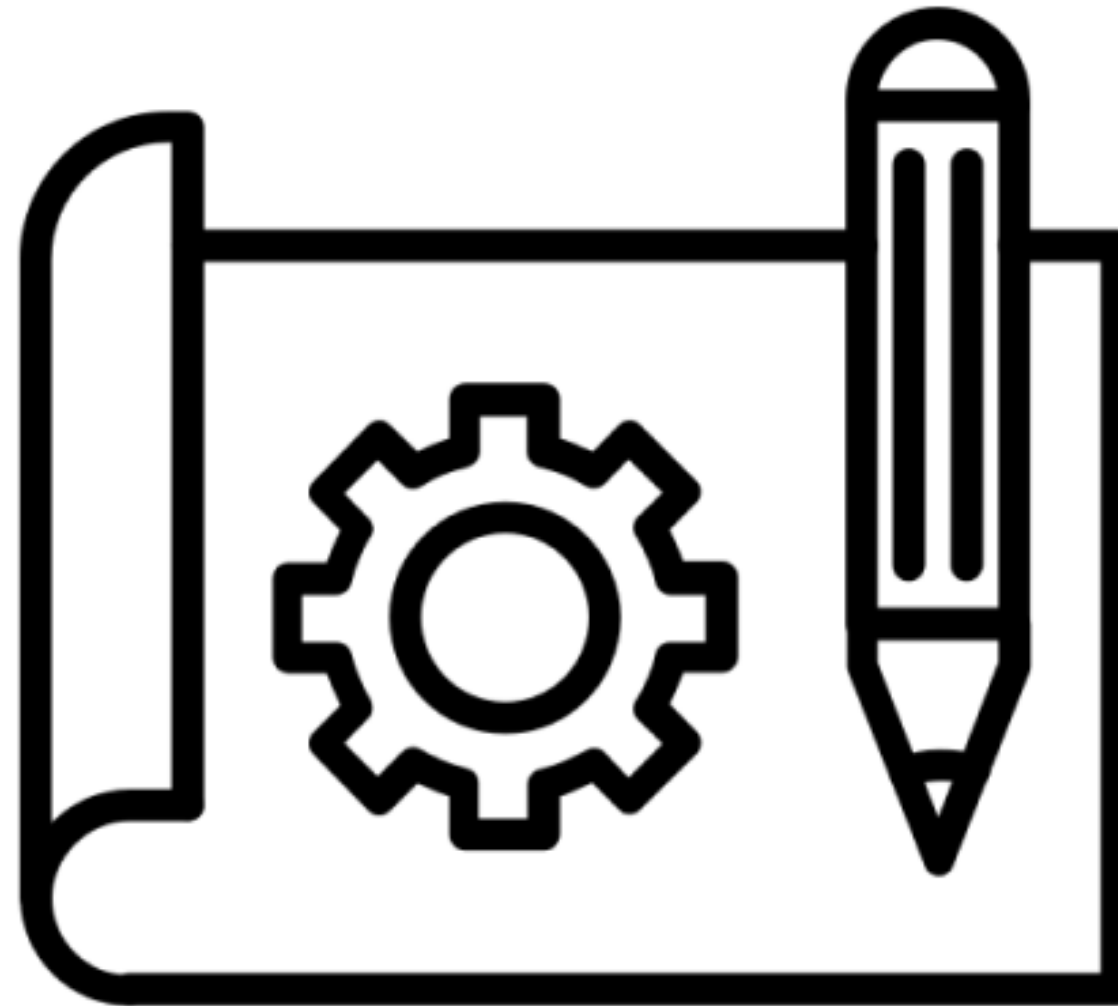
LOW-FIDELITY PROTOTYPES
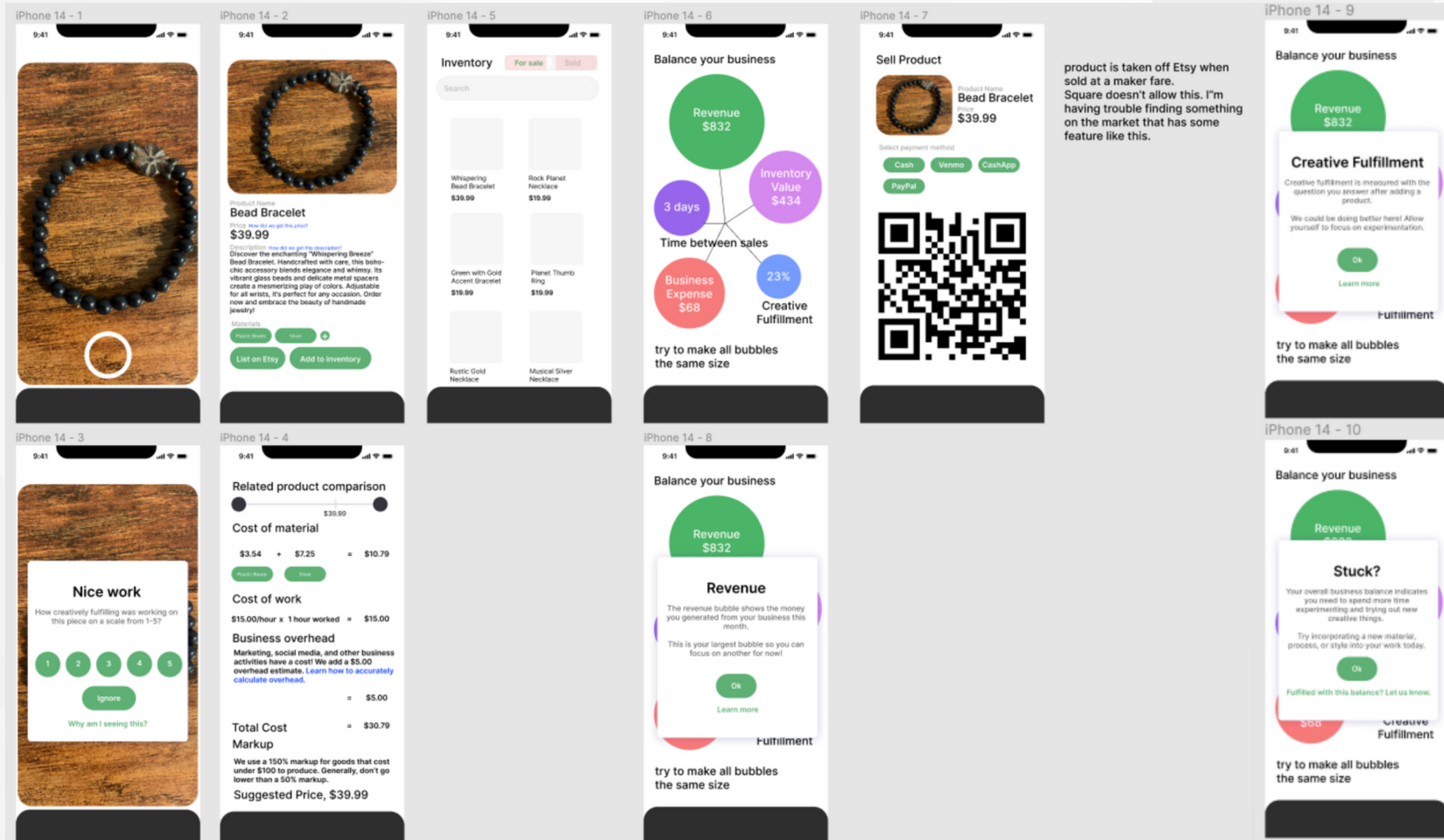
LOW-FIDELITY VISUALIZATIONS

One of our goals withe the app was to show maker entrepreneurs actionable creative and financial insights about their business. I explored different visualizations such as graphical (which are traditional for business apps) as well as gamified (which research show have the potential to impact user behavior [1]). Here are a few prototypes in low-fidelity form.
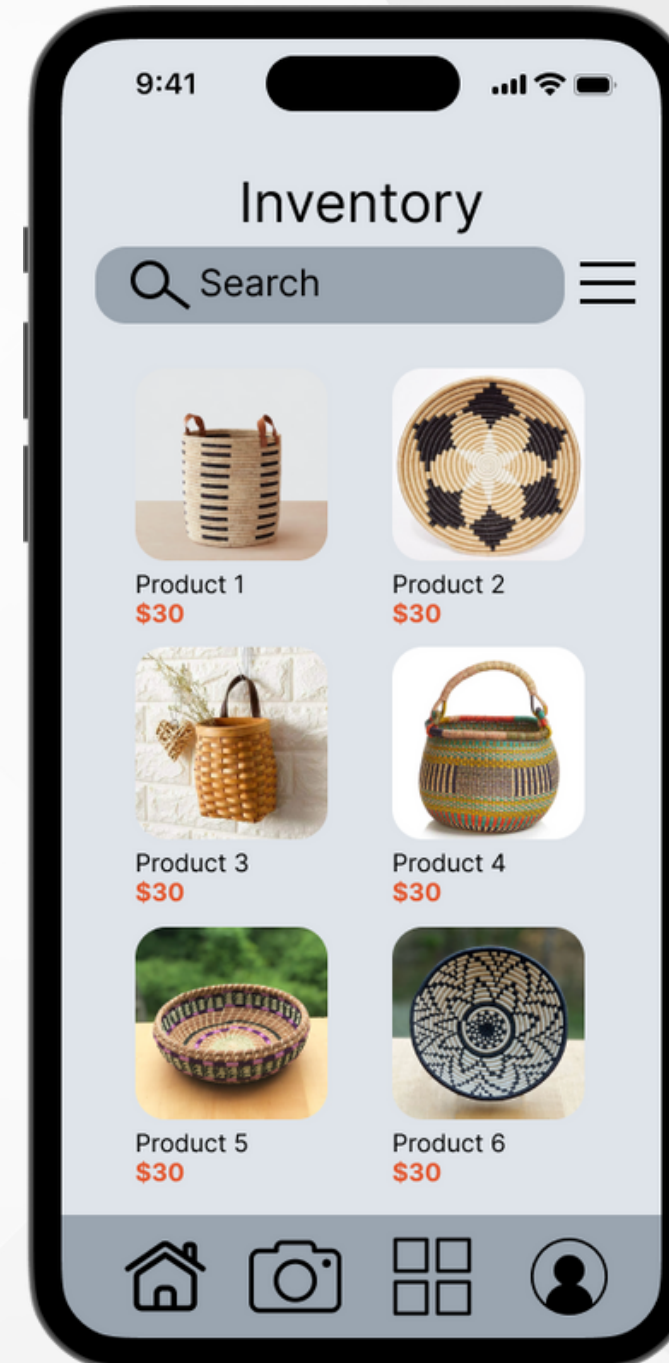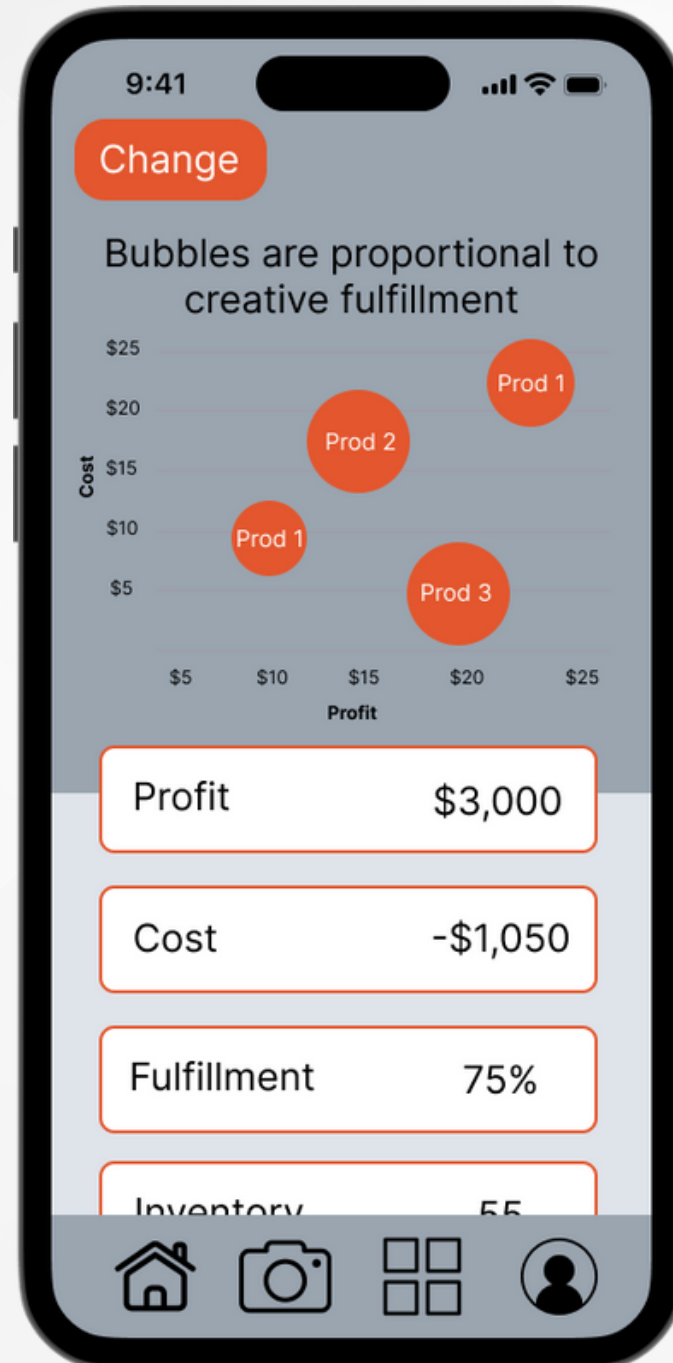

Gamification

Graphical

HIGH-FIDELITY MOCK-UPS

HIGH-FIDELITY VISUALIZATIONS (1/4)

One visualization idea I experimented with was a tree that functioned as an idle game. The tree represents the maker's business as it is a living thing with a life of it's own. The flowers on the tree represent how many different products the maker has uploaded on the app. The maker can water their tree by clicking on a water bucket and reading an update about their business health. If the maker doesn't water their tree for long enough, it will begin to wilt, showing that if a maker does not manage their finances, their business will not be healthy.
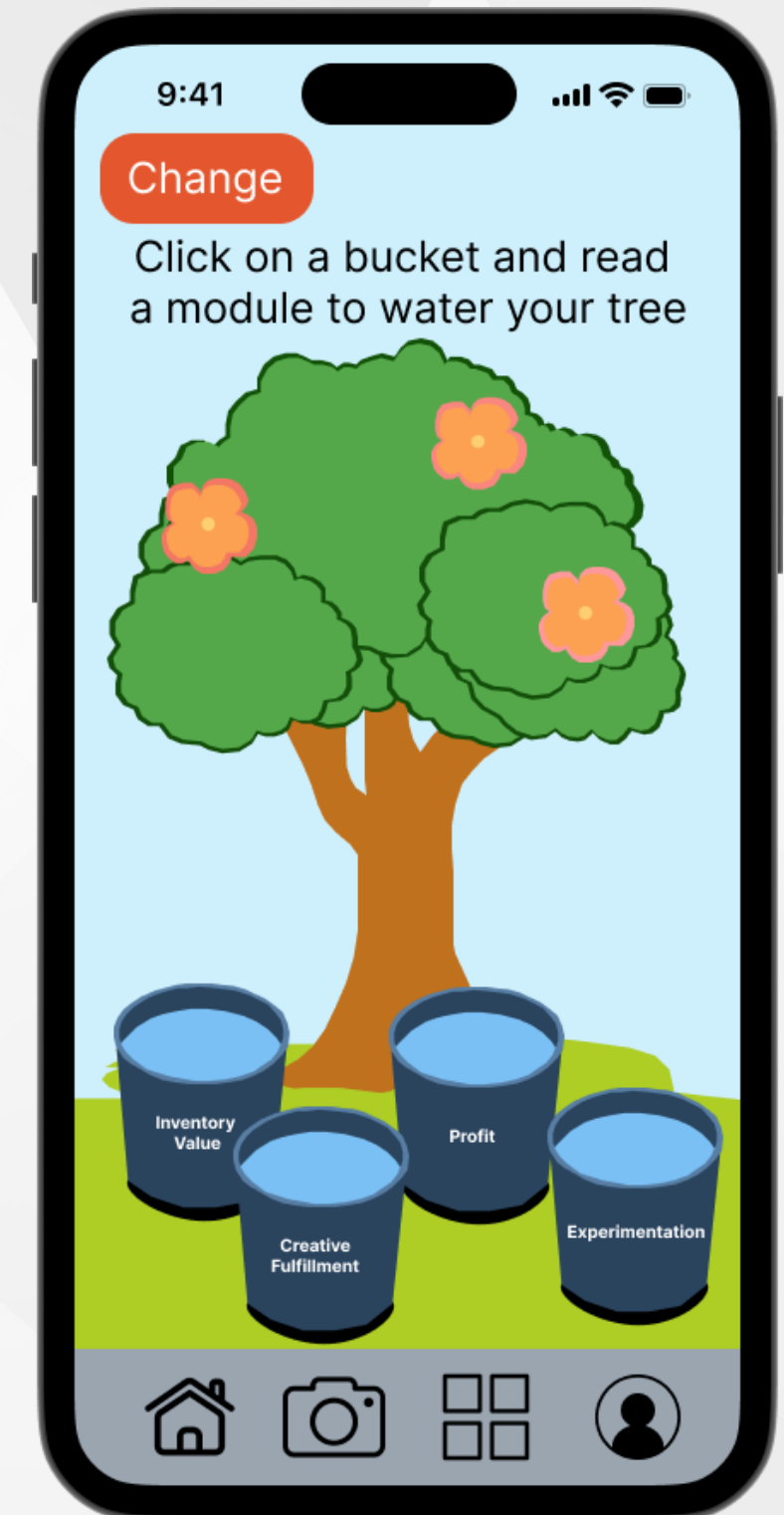
Another gamified visualization I experimented with was a roadmap to success. Makers "drive" a car on a road and encounter roadblock cones along the way. In order to continue on their journey, they must read an update abiout their business health. As they pass certain checkpoints such as selling a certain number of products, a congratulatory flag pops up. Additionally, they have a dashboard to the right that tells them key metrics about their business.

HIGH-FIDELITY VISUALIZATIONS (3/4)

This is a graphical (and also slightly gamified) visualization that shows creative and financial fulfillment as opposite sides of the scale. When they are equal, the scale is balance; when they are unequal, the scale is unbalanced. Makers can re-balance their scales by clicking on the weights and reading an update about their business.

HIGH-FIDELITY VISUALIZATIONS (4/4)

The final visualization I played around with shows a chart of every product the maker has uploaded on the site. The products are arranged on a profit/cost chart so it is clear which products are the most beneficial to the maker. Additionally, the products are arranged so thatt their bubble size is proportional to how creatively fulfilling they were to make, giving makers a lot of insight on how the value of each product they make.
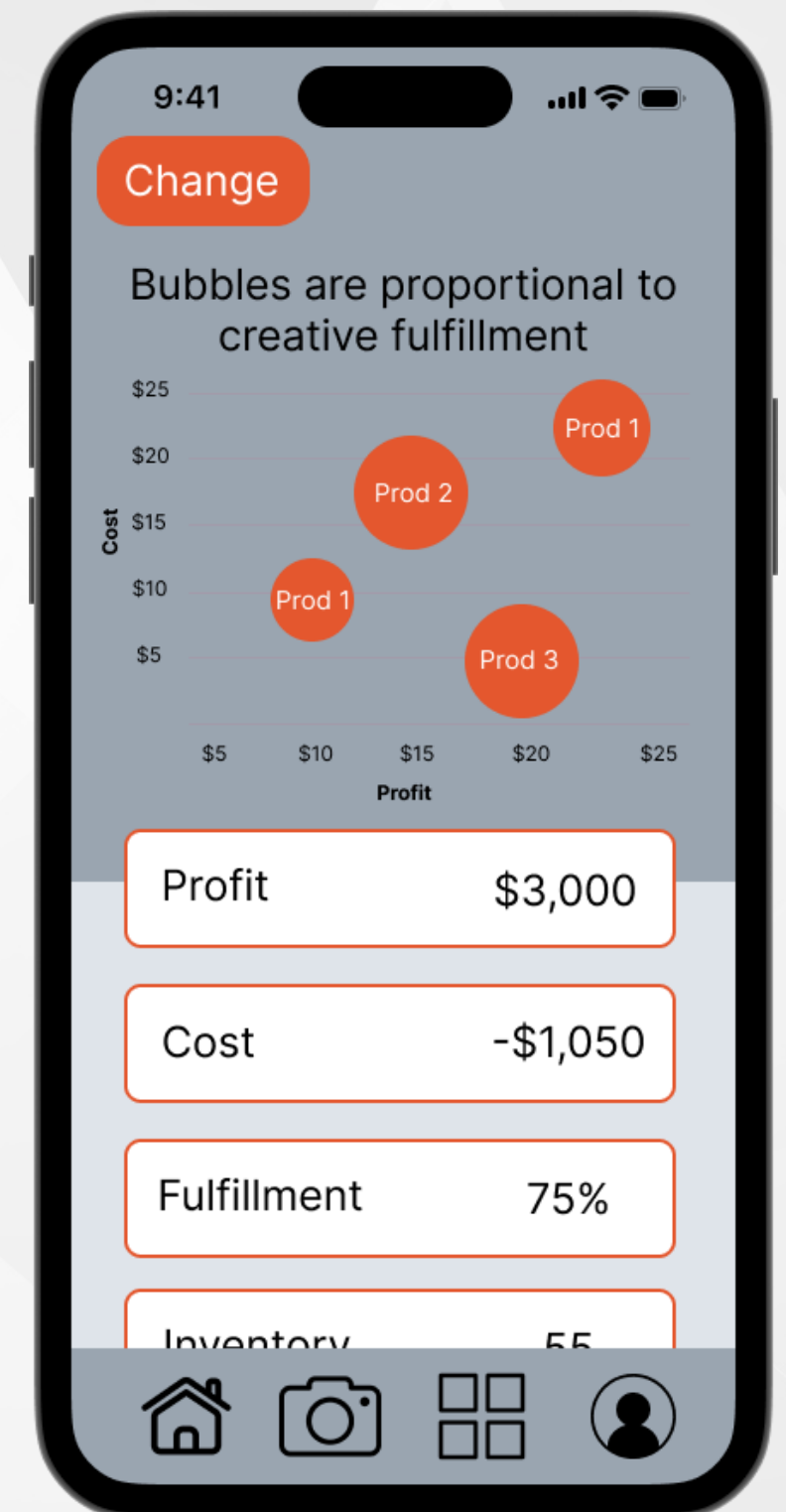
VISUALIZATIONS

I provided a way for users to access all of the visualizations on the app, as we have not decided on one yet. Users can switch visualizations by selecting the orange button in the upper left hand corner
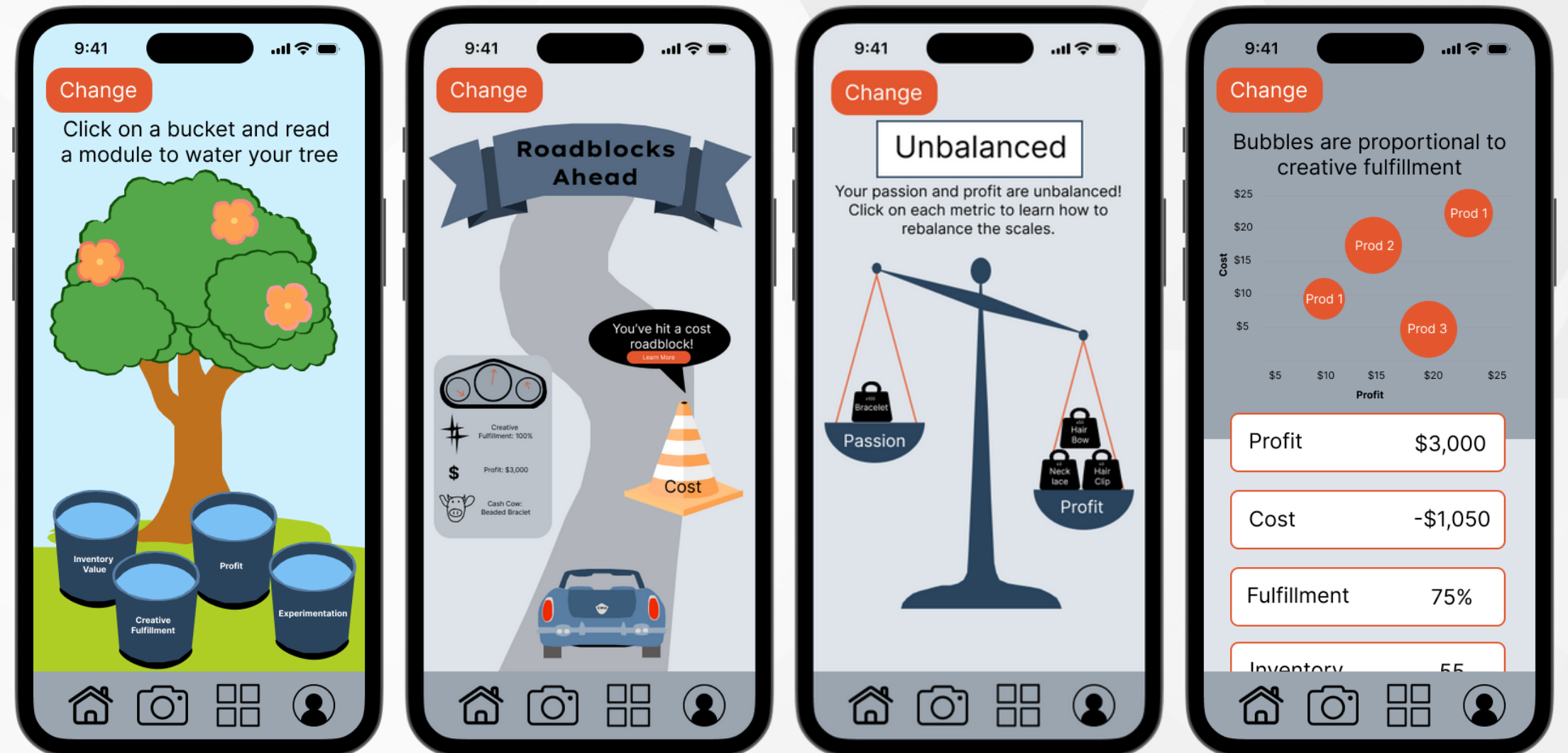
NEW SPREADSHEET DATA INPUT TECHNIQUES

Another goal of ours in the design process was to make the process of entering data as seamless and un-spreadsheet-like as possible for maker entrepreneurs. We experimented with two data input techniques: short surveys and chats with an intelligent business partner
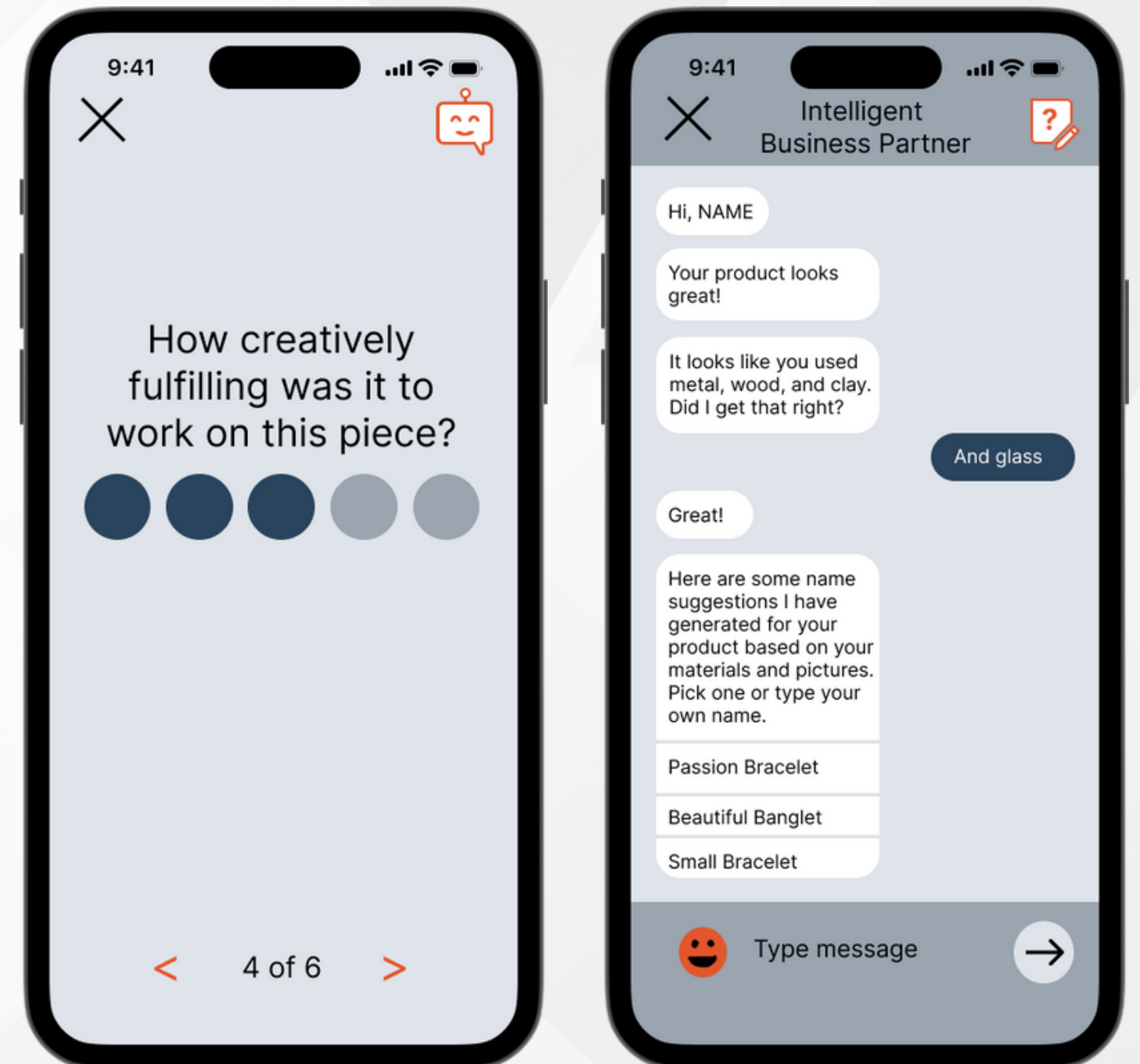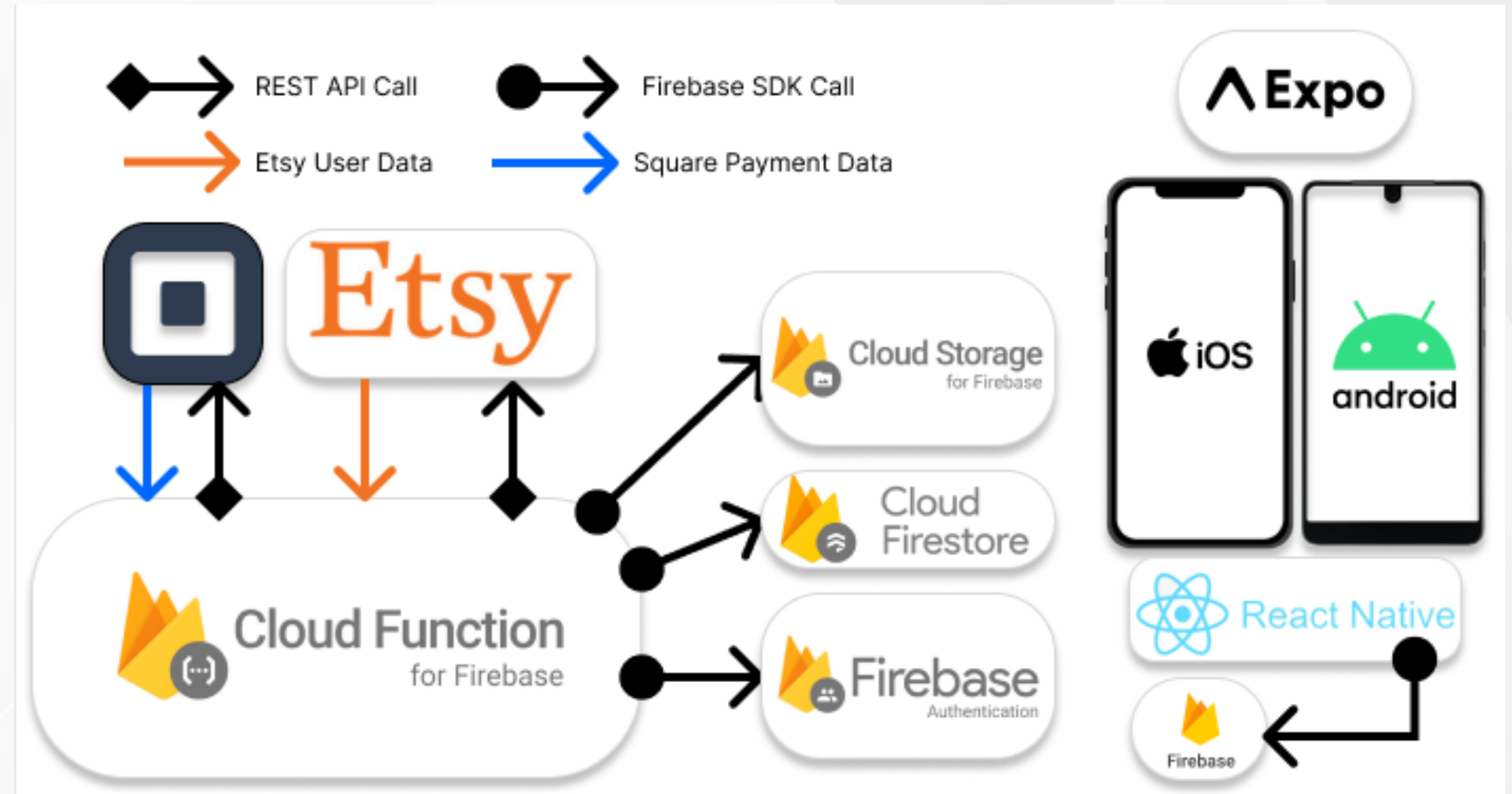
HIGH-FIDELITY PROTOTYPE

View the high-fidelity prototype here

DEVELOPMENT

I worked closely with Quentin as he worked to develop the prototype into a working app. We worked together to make sure the design ideas were translatable and technically feasible. To the right is the working app architecture.

USER RESEARCH

RESEARCH PLAN

I developed a Research Plan to test the usefulness and usability of our tool. The research plan is a **moderated thinkaloud study** that consists of a Pre-Survey, an Opinions section, and a Usability Test. In the opinions section, makers are shown several of the visualizations and rank them from favorite to least favorite. Unfortunately, we had difficulty finding maker entrepreneurs to participate in our study during our short research period, so this usability study is future work.

CONCLUSION

FUTURE WORK

- Conduct user research
  - Determine which visualization works best for maker entrepreneurs
  - Understand preferences regarding data input methods
- Pilot initial prototype
- Implement an autofill feature that fills in an Etsy post with information gathered form the app

WHAT I LEARNED

- Take initiative! Everyone in the academic world is so busy and no one is micromanaging you. If you want to get involved in a project, send those emails, set up those meetings, make it as easy as possible
- Design is an iterative process
- The difference between thinking like a researcher and thinking like an industry worker
- How to receive constructive criticism as an opportunity for growth and be open to feedback in general
- How to design with technical feasibility in mind
- Strengthened my technical skills in Figma
- Strengthened my soft skills in collaboration, constructive criticism, paper writing, and presenting my findings

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- [1] Chaudhry, Sayan, and Chinmay Kulkarni. (2022). Robinhood's Forest: A Persuasive Idle Game to Improve Investing Behavior. 27th International Conference on Intelligent User Interfaces
- [2] Doussard, M., Schrock, G., Wolf-Powers, L., Eisenburger, M., and Marotta, S. (2018). Manufacturing without the firm: Challenges for the maker movement in three U.S. cities. Environment and Planning A: Economy and Space, 50(3):651–670.
- [3] Kotturi, Y., Blaising, A., Fox, S., and Kulkarni, C. (2021). The unique challenges for creative small businesses seeking feedback on social media. Proceedings of the ACM on Human-Computer Interaction, 4(CSCW3).
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THANK YOU!

Feel free to reach out with any
questions, comments, or concerns

Email: courtneykreitzer1@gmail.com
LinkedIn: https://www.linkedin.com/in/courtneykreitzer/