An Innovative Way for Local Bartering

CS 4261/8803 Mobile Apps & Svcs

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Team Name: **PayNothing**

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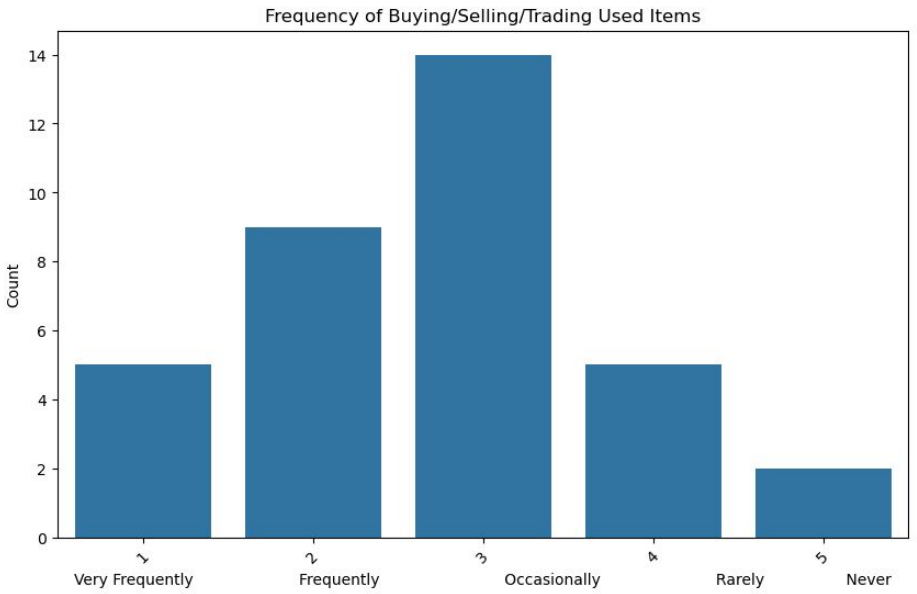
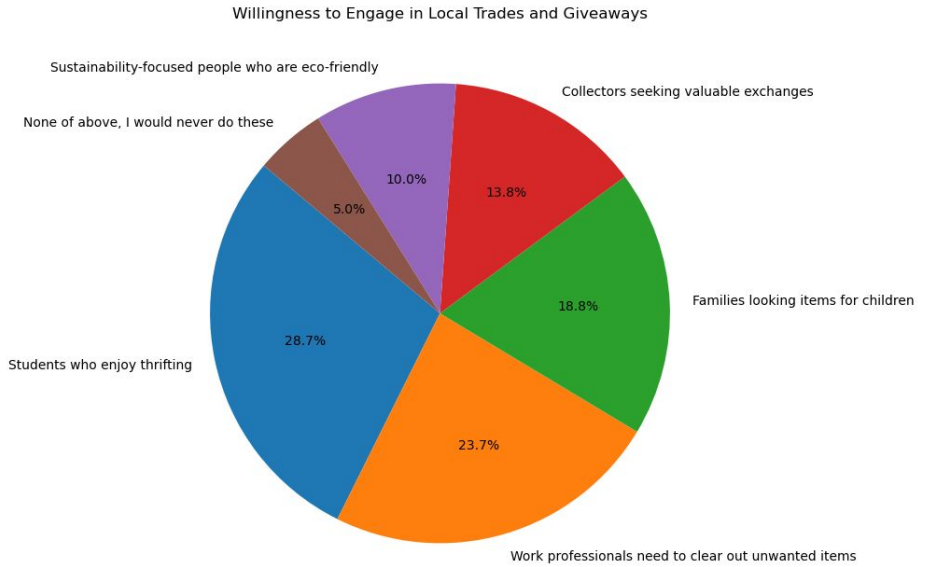
Video: https://drive.google.com/file/d/1JNE42Yqrd-I0_sHj3c3ucydXyCYi8P3Y/view?usp=sharing

Georgia Tech

Problem Overview





Existing online platforms for buying and selling used items — including eBay, Facebook Marketplace, OfferUp, and Craigslist — have long dominated the e-commerce space. However, they increasingly frustrate modern users due to several persistent issues:

1) Time-consuming, repetitive listing processes
2) Hidden or mandatory fees
3) Security and authenticity concerns

Many participants either occasionally or frequently buy, sell, and trade used items.

Primary users who engaging in buying, selling, and trading used items are students, work professionals, and families.

Important Questions and Our Process

Main Questions for Sprint 5:

1) How can we integrate user feedback into our new prototype?
2) What is more important, UI changes or feature updates?

Process to Find a Solution:

1) Prioritize items from high priority to low priority
2) Delegate features and assign deadlines
3) Conduct unit testing
4) Conduct A/B Testing

Solution

Posting Items and Browsing Video Feeds of Items that Users Want to Trade or Giveaway!

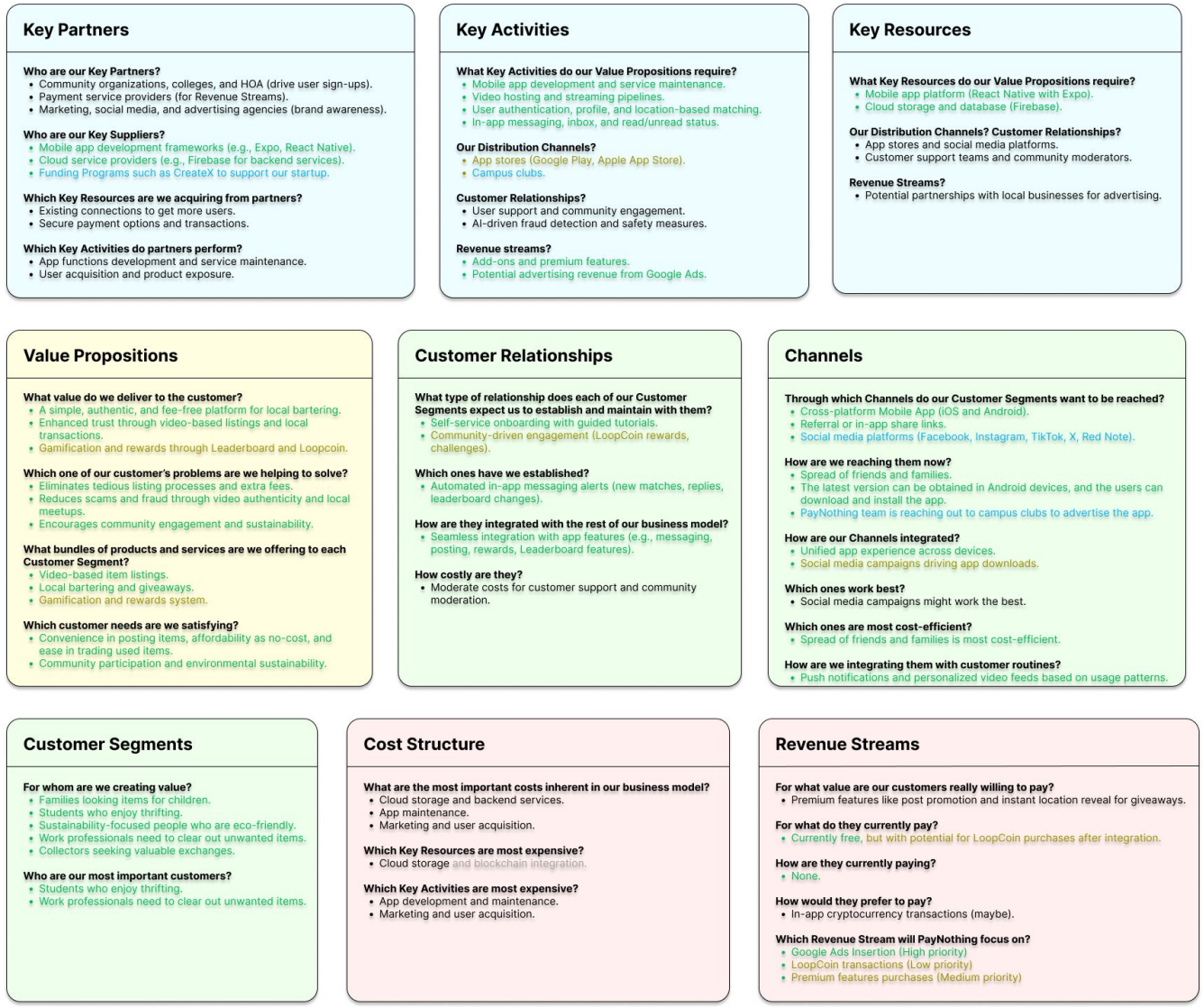
Summary

Users upload short videos of items for barter or giveaway via the “Post” screen. Videos are curated into personalized feeds on the “Home” screen based on location and interests.

Key Benefits

- More Authentic Listings: In-app Video posts prevent scams and fake listings.
- Encourages Local Trades: Promotes in-person exchanges, eliminating shipping costs and wait times.
- Zero Fees: No seller fees, sales tax, or delivery chargers.
- Higher Engagement: A dynamic, video-based marketplace increases interaction.

Summary - Business Model Canvas



Key Partners

Who are our Key Partners?
- Community organizations, colleges, and HOA (drive user sign-ups).
- Payment service providers (for Revenue Streams).
- Marketing, social media, and advertising agencies (brand awareness).

Who are our Key Suppliers?
- Mobile app development frameworks (e.g., Expo, React Native).
- Cloud service providers (e.g., Firebase for backend services).
- Funding Programs such as CreateX to support our startup.

Which Key Resources are we acquiring from partners?
- Existing connections to get more users.
- Secure payment options and transactions.

Which Key Activities do partners perform?
- App functions development and service maintenance.
- User acquisition and product exposure.

Key Activities

What Key Activities do our Value Propositions require?
- Mobile app development and service maintenance.
- Video hosting and streaming pipelines.
- User authentication, profile, and location-based matching.
- In-app messaging, inbox, and read/unread status.

Our Distribution Channels?
- App stores (Google Play, Apple App Store).
- Campus clubs.

Customer Relationships?
- User support and community engagement.
- AI-driven fraud detection and safety measures.

Revenue streams?
- Add-ons and premium features.
- Potential advertising revenue from Google Ads.

Key Resources

What Key Resources do our Value Propositions require?
- Mobile app platform (React Native with Expo).
- Cloud storage and database (Firebase).

Our Distribution Channels? Customer Relationships?
- App stores and social media platforms.
- Customer support teams and community moderators.

Revenue Streams?
- Potential partnerships with local businesses for advertising.

Value Propositions

What value do we deliver to the customer?
- A simple, authentic, and fee-free platform for local bartering.
- Enhanced trust through video-based listings and local transactions.
- Gamification and rewards through Leaderboard and Loopcoin.

Which one of our customer's problems are we helping to solve?
- Eliminates tedious listing processes and extra fees.
- Reduces scams and fraud through video authenticity and local meetups.
- Encourages community engagement and sustainability.

What bundles of products and services are we offering to each Customer Segment?
- Video-based item listings.
- Local bartering and giveaways.
- Gamification and rewards system.

Which customer needs are we satisfying?
- Convenience in posting items, affordability as no-cost, and ease in trading used items.
- Community participation and environmental sustainability.

Customer Relationships

What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
- Self-service onboarding with guided tutorials.
- Community-driven engagement (LoopCoin rewards, challenges).

Which ones have we established?
- Automated in-app messaging alerts (new matches, replies, leaderboard changes).

How are they integrated with the rest of our business model?
- Seamless integration with app features (e.g., messaging, posting, rewards, Leaderboard features).

How costly are they?
- Moderate costs for customer support and community moderation.

Channels

Through which Channels do our Customer Segments want to be reached?
- Cross-platform Mobile App (iOS and Android).
- Referral or in-app share links.
- Social media platforms (Facebook, Instagram, TikTok, X, Red Note).

How are we reaching them now?
- Spread of friends and families.
- The latest version can be obtained in Android devices, and the users can download and install the app.
- PayNothing team is reaching out to campus clubs to advertise the app.

How are our Channels integrated?
- Unified app experience across devices.
- Social media campaigns driving app downloads.

Which ones work best?
- Social media campaigns might work the best.

Which ones are most cost-efficient?
- Spread of friends and families is most cost-efficient.

How are we integrating them with customer routines?
- Push notifications and personalized video feeds based on usage patterns.

Customer Segments

For whom are we creating value?
- Families looking items for children.
- Students who enjoy thrifting.
- Sustainability-focused people who are eco-friendly.
- Work professionals need to clear out unwanted items.
- Collectors seeking valuable exchanges.

Who are our most important customers?
- Students who enjoy thrifting.
- Work professionals need to clear out unwanted items.

Cost Structure

What are the most important costs inherent in our business model?
- Cloud storage and backend services.
- App maintenance.
- Marketing and user acquisition.

Which Key Resources are most expensive?
- Cloud storage and blockchain integration.

Which Key Activities are most expensive?
- App development and maintenance.
- Marketing and user acquisition.

Revenue Streams

For what value are our customers really willing to pay?
- Premium features like post promotion and instant location reveal for giveaways.

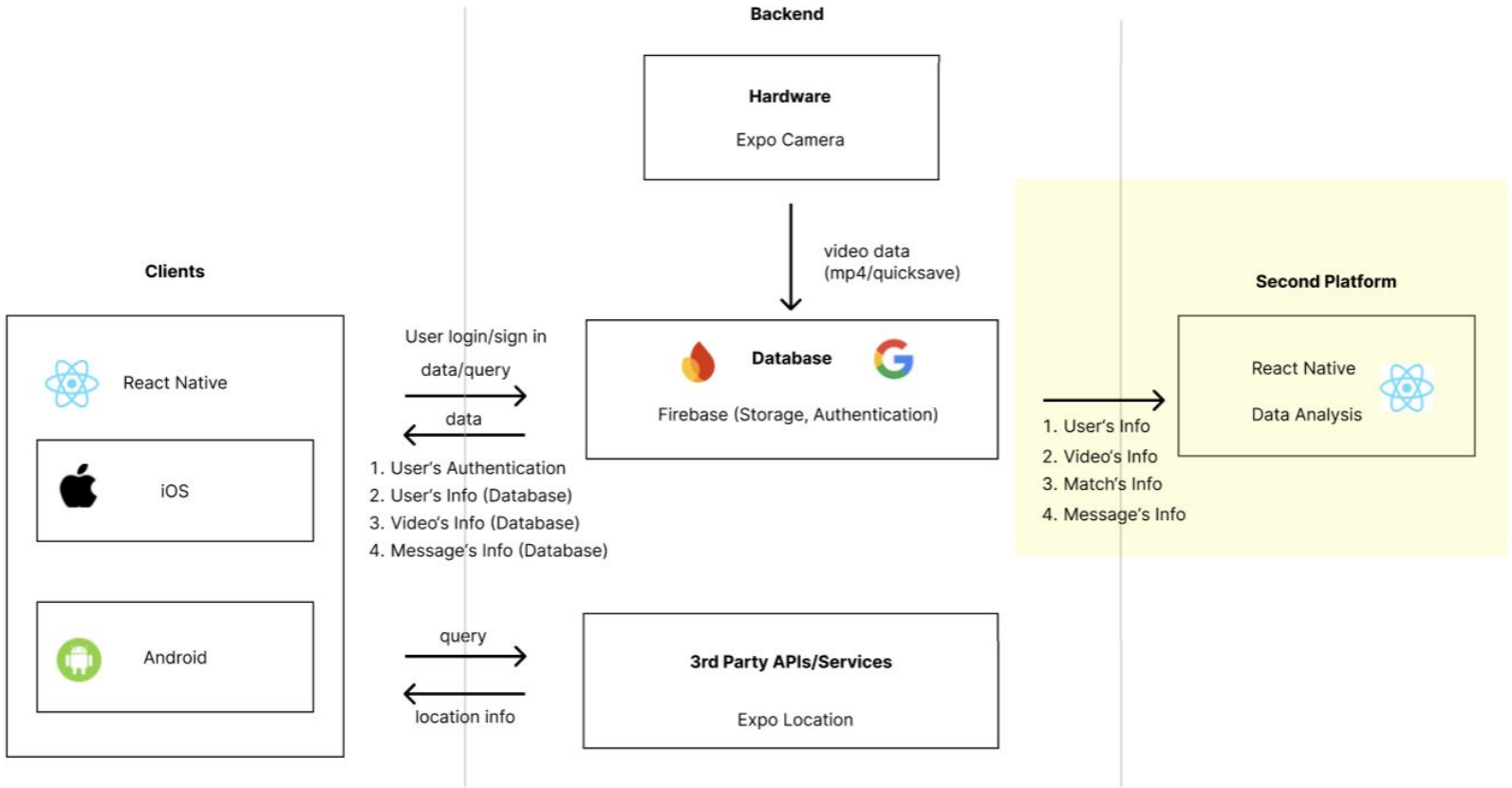
For what do they currently pay?
- Currently free, but with potential for LoopCoin purchases after integration.

How are they currently paying?
- None.

How would they prefer to pay?
- In-app cryptocurrency transactions (maybe).

Which Revenue Stream will PayNothing focus on?
- Google Ads Insertion (High priority)
- LoopCoin transactions (Low priority)
- Premium features purchases (Medium priority)

High-Level Project Architecture



Our app is developed using **React Native with Expo Framework**, making it **cross-platform** for both **iOS** and **Android** devices.

1. **Firebase** for **authentication** such as sign-up, login, and user profile management.
2. **Firestore** for **database storage**
3. **Expo Camera** for media capture and **Expo Location** for location services.
4. **Messaging System** from Firestore, which enables real-time messaging between users.

For the 2nd platform, we also use **React Native** to create a Data Analysis Dashboard to show users' info of PayNothing with **Firebase API**.

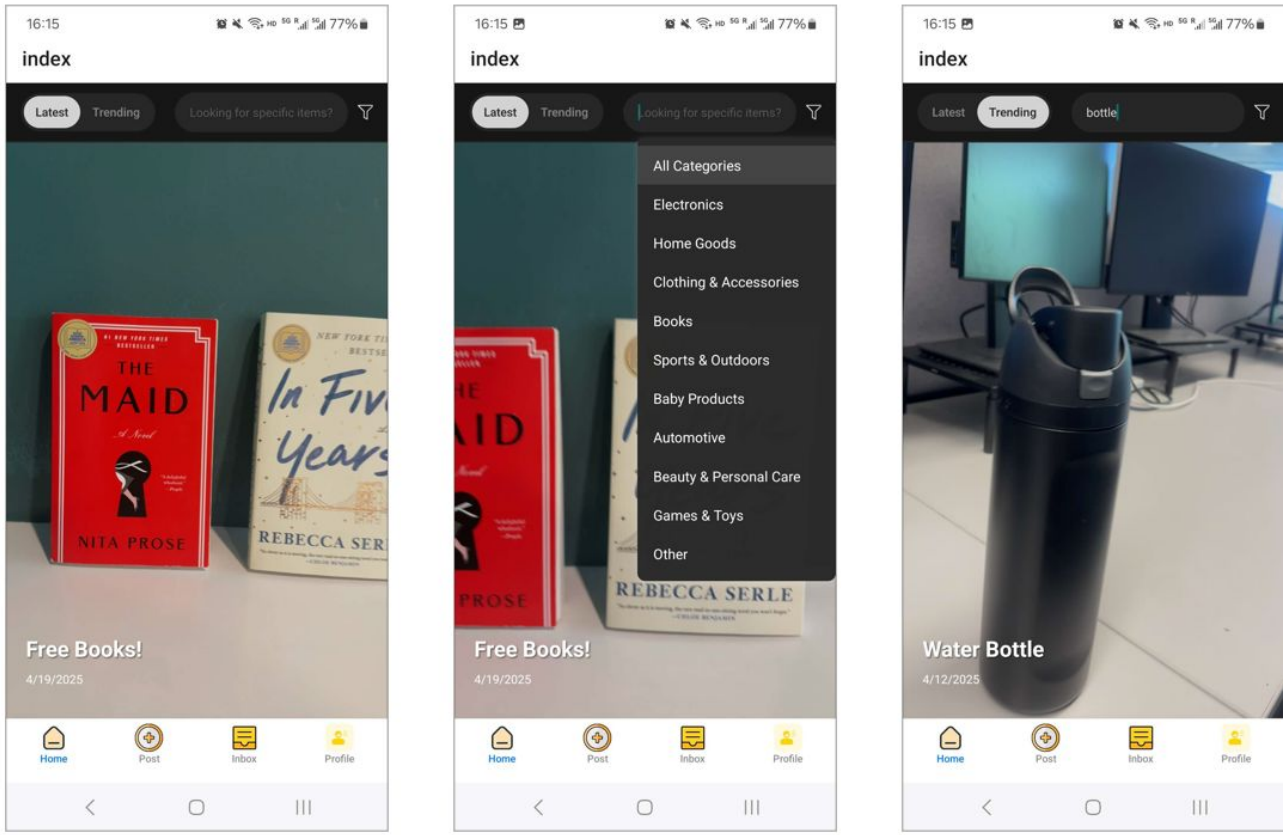
Storyboard & Primary User Case

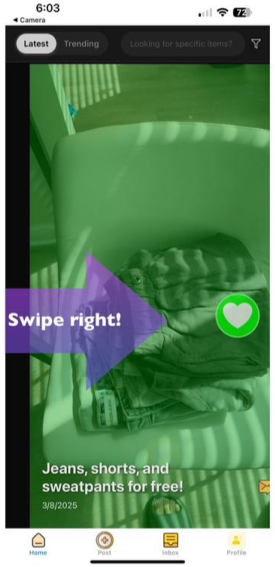


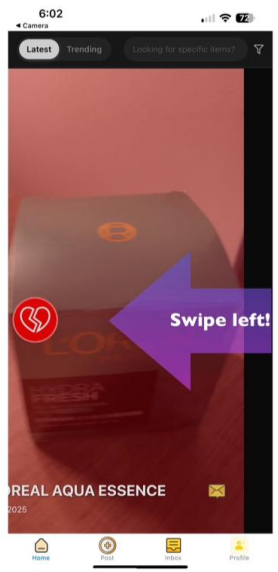

Sign up/sign-in, post items, browse item feeds, message the user to complete transactions

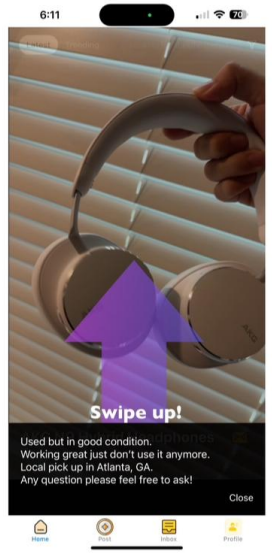
- Tom sets up his profile on the app and enters his location
- Tom takes the old sneakers, shoots a short video with his mobile phone, edits info and gets the location
- After Tom posted the video, nearby users see the video on their mobile phones
- Tom and the other party reply to the message in the app's Inbox to confirm the transaction details

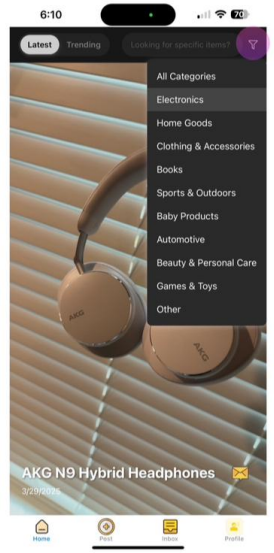
Final Prototype —— Match (A/B test)





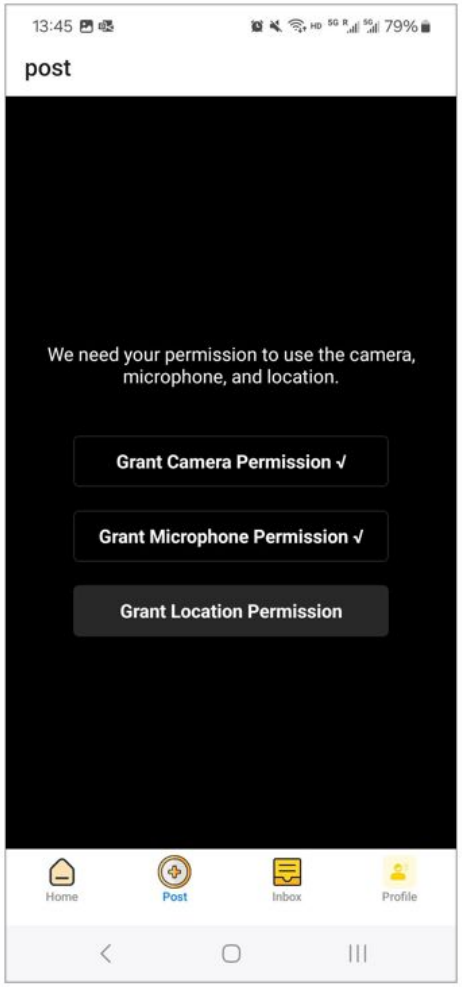


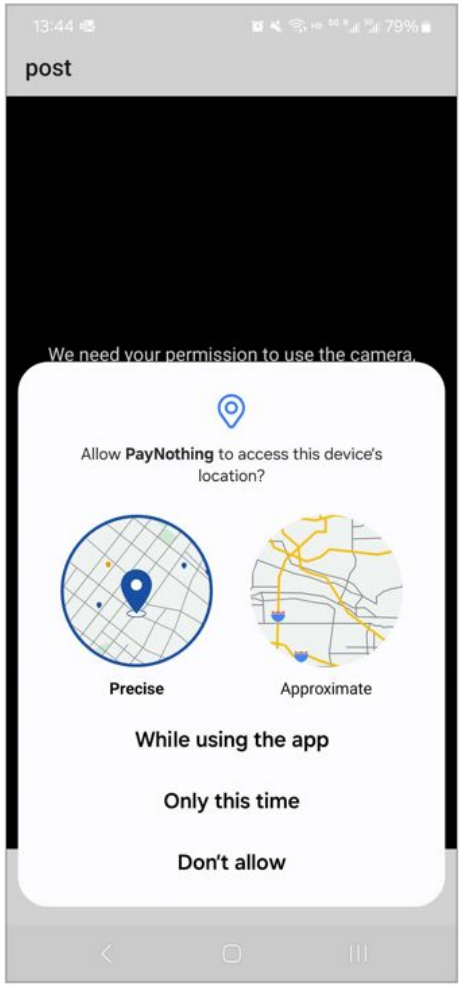


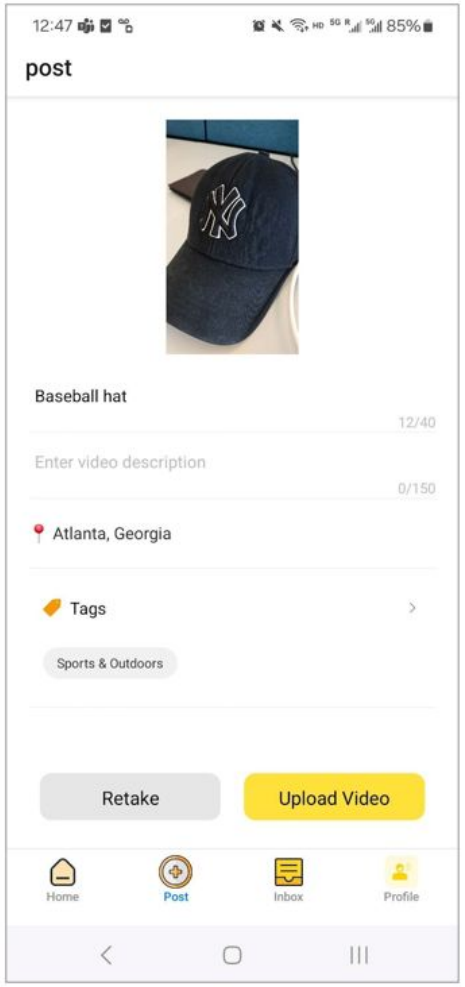


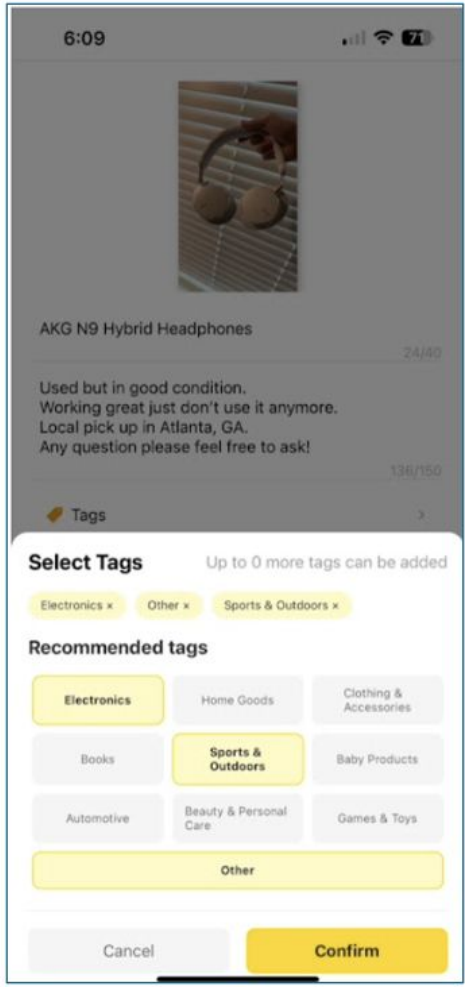
Home

Final Prototype—— Location (A/B test)



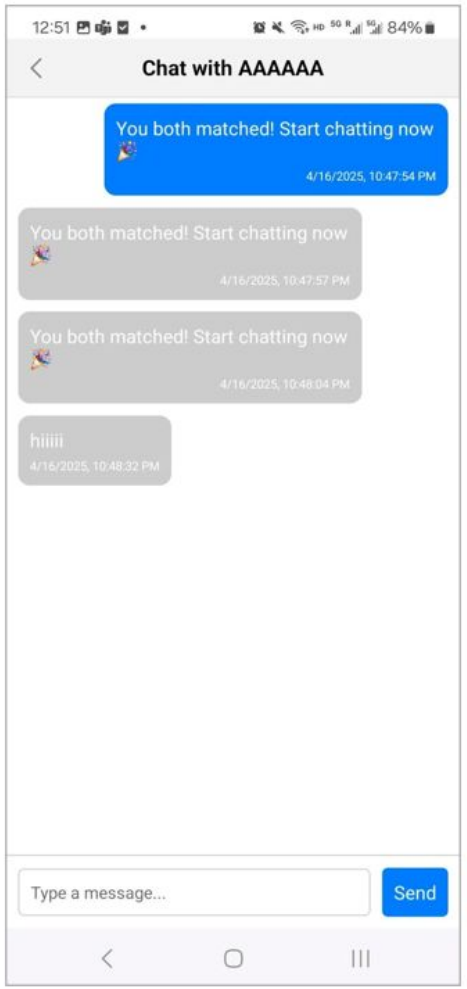


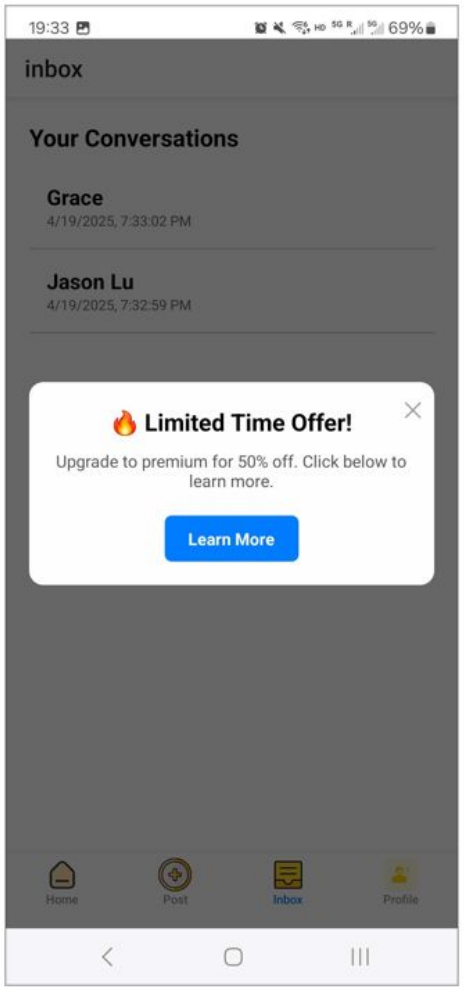




Post

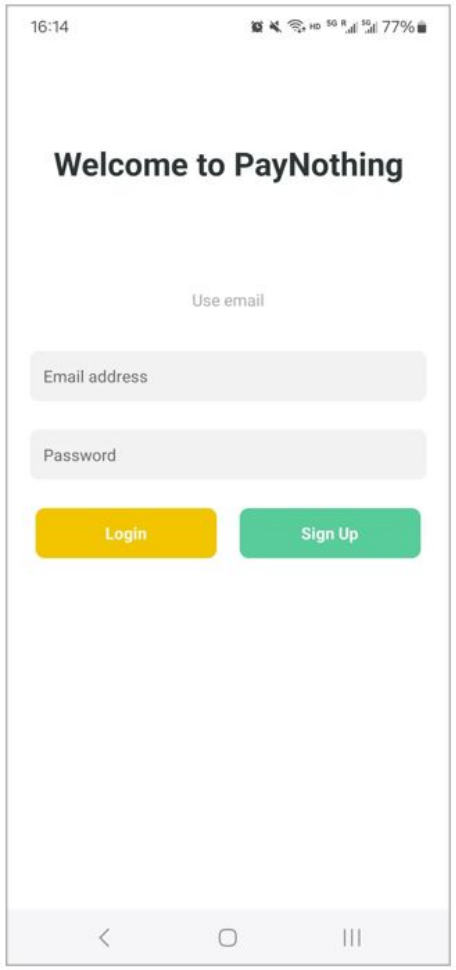
Final Prototype —— Timestamps, Ads (A/B test)

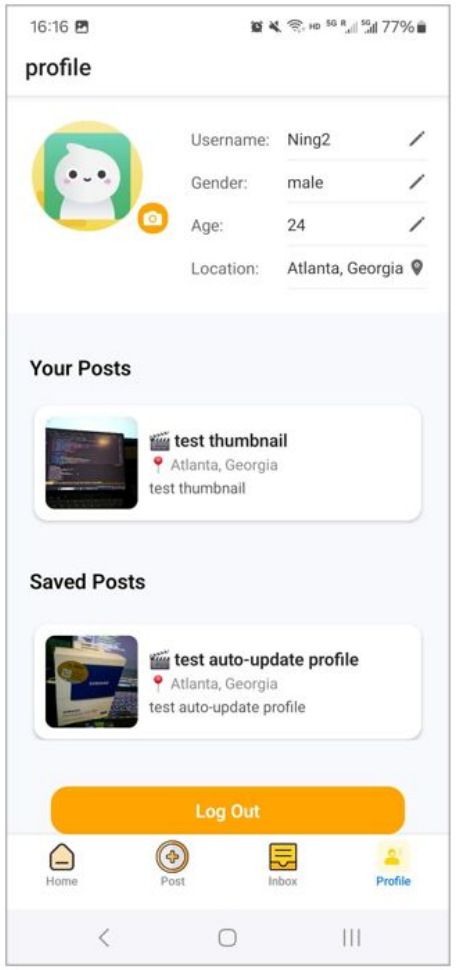


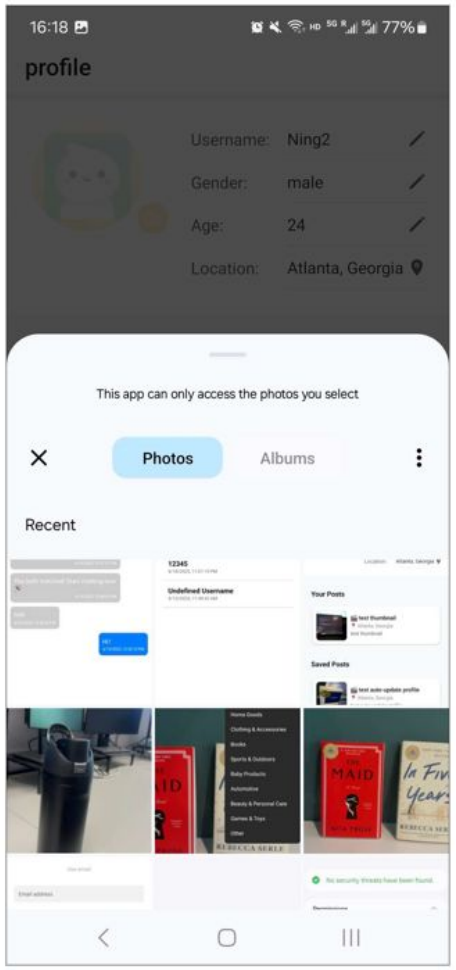


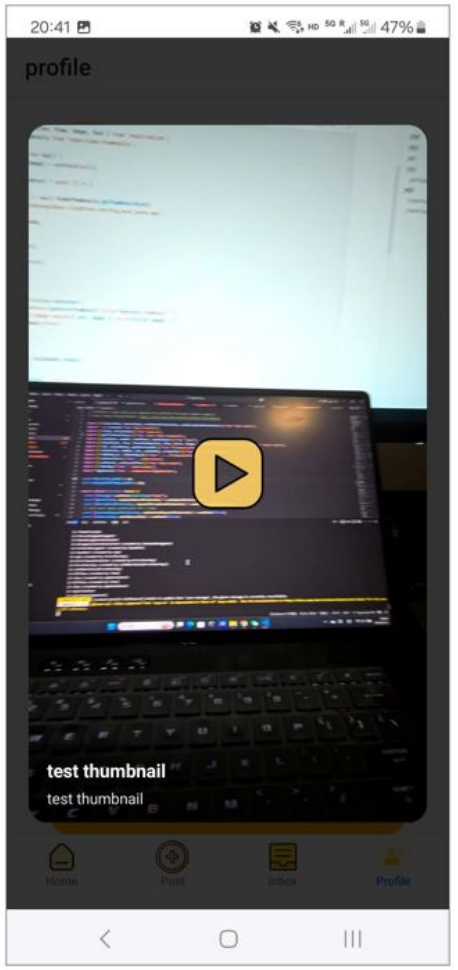
Inbox and Chat

Final Prototype —— Records (A/B test)









Auth

Profile

Summary - Key Insights from A/B Testing Results

Metric	Old App Avg	New App Avg	Change
Post Time	3.02 minutes	3.72 minutes	+23% (tag selection adds time)
Message Responses	0.9 per user	2.35 per user	+2.6x more messages
Ads Clicked	N/A	1.1 per user	New feature usage
Sign-up/Sign-in Time	2.5 minutes	1.8 minutes	+28% faster
App Stay-on Time	11.4 minutes	15.6 minutes	+37% more focus on content
UI/UX Rating	6.7 / 10	7.8 / 10	+16% increase in satisfaction

Insights & Analysis:

- Users now post and browse more purposefully due to categories tags and swiping interaction.
- The match system is more intuitive and successful because matched users already liked each others' items.
- Required login upfront streamlines feature access and improves guidance, while users are only informed to sign-up/sign-in when they decide to post items or message others.
- Ads are noticed in the Inbox screen but not too disruptive.
- Swiping UI and cleaner layout help improve perceived polish and more engagement.

Next learning Prototype

- **Multi-Clip & Scheduled Publishing**

  Enabling sellers to combine 3–5 video clips, auto-select thumbnails, and schedule posts during high-traffic windows.

  Metrics: listing completion rate, scheduled post usage, and swipe-through rate.
- **Rich Chat & Negotiation Tools**

  Expanding messaging with photo and voice support for seamless item verification and faster deal closure.

  Metrics: chat-to-deal conversion, media message frequency, and average chat duration.
- **Personalized Feeds & Ad Optimization**

  Leveraging BigQuery pipelines to capture swipes, matches, and ad interactions for:

  – Smarter "For You" recommendations

  – Real-time ad capping and placement tuning

  Metrics: match success rate, feed engagement delta.

Code Review: The Magic of Matching – How PayNothing Connects Givers and Receivers

```ts
const sendPushNotification = async (expoPushToken: string, message: string) => {
  await fetch("https://exp.host/--/api/v2/push/send", {
    method: "POST",
    headers: {
      Accept: "application/json",
      "Accept-encoding": "gzip, deflate",
      "Content-Type": "application/json",
    },
    body: JSON.stringify({
      to: expoPushToken,
      sound: "default",
      title: "🎉 New Match!",
      body: message,
      data: { screen: "Inbox" },
    }),
  });
};
```

```ts
const createChatBetweenUsers = async (uid1: string, uid2: string) => {
  const chatId = [uid1, uid2].sort().join("_");

  // Create starter message
  await addDoc(collection(FIRESTORE_DB, "messages"), {
    conversationId: chatId,
    senderId: uid1,
    receiverId: uid2,
    senderUsername: user?.displayName || "New Match!",
    text: "You both matched! Start chatting now 🎉",
    timestamp: Date.now(),
    read: false,
    participants: [uid1, uid2],
  });

  // Fetch both push tokens
  const [snap1, snap2] = await Promise.all([
    getDoc(doc(FIRESTORE_DB, "users", uid1)),
    getDoc(doc(FIRESTORE_DB, "users", uid2))
  ]);

  const token1 = snap1.data()?.expoPushToken;
  const token2 = snap2.data()?.expoPushToken;

  if (token1) await sendPushNotification(token1, "You matched with someone!")
  if (token2) await sendPushNotification(token2, "You matched with someone!")
};
```

Match Algorithm

This app uses a **swipe-based matching algorithm** inspired by social and dating platforms. Each video post represents an item available for local bartering. Users interact with these posts through intuitive swipe gestures:

- 👉 **Swipe Right** to send interest in trading (like).
- 👈 **Swipe Left** to skip (dislike).
- 👇 **Swipe Down** to save for later.
- ☝️ **Swipe Up** to see the item full description.

When **two users mutually swipe right on each other's posted item**, a **match is created**. The system then:

1. Automatically initializes a private chat between the two matched users.
2. Sends a **real-time push notification** to both parties.
3. Records the match in a matches Firestore collection for persistence.

Thank you!