

Second-life App Case Study

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Project overview

1. The product

The Second-life app addresses the growing challenge of electronic waste by providing a platform for recycling, refurbishing, and reselling old electronics. Targeting eco-conscious consumers and tech enthusiasts, the app allows users to schedule pickups, offer delivery services, and purchase refurbished items. Earnings from delivery services can be used as credits for purchases or transferred to bank accounts, blending service and commerce in a seamless user experience.

2. Project Duration

January 2022 – June 2025

3. Problem Statement

Electronic waste continues to pose serious environmental risks due to improper disposal and limited recycling infrastructure.

4. Objectives

The goal of the Second-life app is to create a user-friendly, sustainable platform that simplifies the recycling and reuse of electronics. The app enables users to schedule pickups, act as carriers, and shop for high-quality refurbished products—encouraging environmentally responsible behavior.

5. My Role and Responsibilities

As the sole designer and developer for this project, I independently led the full UX and front-end development process to simulate real-world product constraints. While this project was part of a design thinking course, all research, design, and implementation decisions were self-directed and grounded in user-centered methodologies.

- a. Conducted stakeholder and user interviews to uncover needs and pain points
- b. Defined personas, journey maps, and problem statements
- c. Created wireframes, interactive prototypes, and low-to-high fidelity UI mockups
- d. Performed comparative usability testing with four interface versions
- e. Developed a modular React Native app architecture using Context API and TypeScript
- f. Designed and implemented a token-based design system for consistency and scalability
- g. Collaborated with peers for occasional feedback, but owned the end-to-end design, research, and development lifecycle

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Understanding the user

1. User research summary

Through surveys, interviews, and competitive analysis, we identified key user needs and pain points related to electronic waste management. Initially, we hypothesized convenience and environmental concerns as primary motivators. However, the findings revealed additional priorities: data security and trust in the recycling process. These insights informed the app's direction toward more transparent, secure, and user-reliable features.

2. Key Pain Points & Design Reflections

a. Inconvenient Recycling Options

- Pain Point: Users lack easy access to reliable recycling services.
- Design Response: Introduced a flexible pickup scheduling feature to increase recycling frequency.

b. Lack of Trust in Refurbished Products

- Pain Point: Skepticism about quality and reliability.
- Design Response: Added product ratings, transparent refurbishment info, and warranties to instill trust.

c. Data Security Concerns

- Pain Point: Users worry about personal data on recycled devices.
- Design Response: Implemented secure data-wiping protocols and clear communication about privacy policies.

d. Limited Awareness of E-waste Impact

- Pain Point: Users are unaware of the environmental effects of improper e-waste disposal.
- Design Response: Integrated educational content and eco-tips to raise awareness.

e. Technical Performance Issues

- Pain Point: Users encountered slow performance and poor navigation.
- Design Response: Focused on responsive UI design and robust usability testing to improve performance and reliability.

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3. Persona & User Journey Map

[Tech Enthusiasts]: People interested in refurbished electronics or recycling technology, who might participate in community discussions or purchase related products and services.

	"Turning old gadgets into new opportunities for a cleaner future."	
	Needs and Goals: • Need: Convenient and transparent solution for recycling old electronic devices and purchasing refurbished electronics. • Goal: To be responsible for the dispose of old electronics while potentially benefiting from incentives like discounts or rewards, and to buy affordable and reliable refurbished electronics.	Challenges: • Uncertainty about proper disposal methods. • Lack of convenient options for recycling electronics. • Desire for clear communication and transparency in the recycling and refurbishing processes.
Background: • Age: 35 • Education: Bachelor's degree in computer science • Hometown: San Francisco, CA • Family: Married with two children • Occupation: Software Engineer at a tech startup • Behavior: Keeps old electronic devices in a drawer due to uncertainty about disposal methods and occasionally gives them to friends or family.. • Attitude: "Responsible tech use isn't just about buying the latest gadgets—it's also about what we do with the ones we no longer need."	Summary: Jane Doe, a busy software engineer and mother of two, finds herself with a drawer full of outdated electronics and gadgets accumulated over the years. Concerned about the environmental impact of simply discarding them, Jane decides to explore options for responsible disposal and potential purchases of refurbished electronics. She hears about a new app designed for tech enthusiasts like herself, promising easy scheduling for pickups of old electronics, transparent recycling processes, and a marketplace for refurbished gadgets with warranties. Eager to declutter responsibly and possibly upgrade her gadgets affordably, Jane signs up for the app, hoping it will provide the convenience and reliability she seeks.	

a. Problem Statement

Jane Doe, a tech enthusiast and software engineer, needs a convenient and transparent app solution for recycling old electronic devices and purchasing refurbished electronics because current options lack user-friendly accessibility, fail to provide adequate information on recycling and refurbishing processes, and do not offer reliable incentives or warranties, leaving her uncertain about the environmental impact and quality of her electronic disposal and upgrade decisions.

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b. As-Is User Journey Map for Jane Doe

	Discovery	Consideration	Decision	Usage	Advocacy
Actions: What does the customer do?	Searches for apps or trends related to refurbished electronics or recycling technology.	Reads reviews, compares features of different apps or platforms.	Registers on an app, makes a purchase of a refurbished product.	Schedules a pickup for recycling, makes subsequent purchases.	Shares experience, recommends or discourages app usage or specific products.
Touchpoints: What part of the service do they interact with?	Online forums, social media groups focused on tech or sustainability, and app stores.	App reviews, community discussions, product listings on ecommerce platforms.	Signing up for an app or making a purchase on an ecommerce platform.	Using the app for recycling pickups or buying refurbished products.	Online reviews, social media posts, recommendations to friends and family.
Customer Thought: What is the customer thinking?	"I want to find a reliable way to dispose of my old electronics or buy refurbished ones."	"Which app offers the best value and user experience for recycling or buying refurbished electronics?"	"Will this app deliver on its promises? Can I trust this refurbished product to function properly?"	"Is the recycling process efficient and environmentally friendly? Are the refurbished products of high quality?"	"I want others to benefit from my positive experiences or avoid the frustrations I encountered."
Customer Feeling: What is the customer Thinking?	Curious but cautious, seeking trustworthy solutions.	Frustrated with the lack of transparency in some apps, uncertain about the reliability of product listings.	Anxious about the reliability and performance of the app or product.	Dissatisfied with delays in pickups or disappointed by the quality of refurbished products.	Empowered by the ability to influence others' choices, motivated to promote responsible tech consumption.
Process ownership: Who is the lead on this?	Self-driven research.	App developers, e-commerce platforms.	App developers, ecommerce platforms.	App developers, recycling service providers, ecommerce platforms.	None (self-initiated).
Opportunities	Targeted ads or promotions highlight convenience and benefits of using a recycling or refurbishing app.	Enhance transparency in app features and product descriptions to build trust.	Offer clear communication on product warranties, return policies, and customer support to alleviate concerns.	Improve service efficiency, ensure high standards in product refurbishment, and offer prompt customer support.	Encourage satisfied users to advocate through referral programs or community engagement features, address and resolve issues for dissatisfied users promptly.

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[Business Clients]: Companies with massive quantities of old electronic equipment that need disposal, seeking suitable recycling or refurbishment solutions.

	"Reducing waste isn't just about compliance—it's about setting an example for my community."	
	Needs and Goals: • Efficiently manage and dispose of old electronic devices from her small business. • Reduce environmental impact by responsibly managing e-waste. • Save costs on new electronics by considering refurbished options..	Challenges: • Limited convenient recycling options for e-waste. • Lack of clear guidelines and resources for proper disposal. • Difficulty in scheduling and tracking recycling processes.
Background: • Age: 40 • Education: Holds a bachelor's degree in business administration from a local university. • Hometown: Grew up in a suburban area but now resides in an urban setting due to business operations. • Family: Single. • Occupation: Owns and manages a small retail business specializing in eco-friendly home products.	Summary: Lisa, an initiative-taking small business owner enthusiastic about sustainability, finds herself accumulating a growing pile of outdated electronic devices. Despite her efforts to research local recycling options, she struggles to find convenient and reliable solutions that align with her business schedule. She values transparency and efficiency in environmental practices and seeks an app that not only simplifies the recycling process but also educates her on best practices for extending the life of electronic devices. Lisa's journey underscores her commitment to responsible business practices and her desire to make a positive environmental impact while managing day-to-day operations effectively.	

a. Problem Statement

Lisa Wong is a proactive single small business owner who needs a reliable e-waste management solution because she faces limited local recycling options and struggles with navigating the complexities of e-waste disposal regulations.

b. As-is User Journey Map for Lisa Wong

	Realization	Searching for Solutions	Evaluating Options	Attending a Recycling Event	Storing Electronics
Actions: What does the customer do?	Notices a growing pile of outdated electronics in her office.	search online for e-waste management solutions.	Considers local government recycling events and other services.	Participates in a local government-organized recycling event (Gathers old devices, drives to the event, waits in line, hands over devices.)	Stores electronics until the next available recycling opportunity.
Touchpoints: What part of the service do they interact with?	Office environment.	Search engines, forums, social media.	Community websites, local government announcements, recycling service websites.	Event location, interactions with event staff.	Office storage areas.

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Customer Thought: What is the customer thinking?	"I need to do something about all this old equipment."	"There must be a better way to recycle these devices."	"Are these events reliable and convenient for my schedule?"	"I hope this event is well-organized and efficient. However, this event seems crowded, and it takes me a lot of time "	"After the event, I didn't receive any follow-up or updates. I do not want to attend again. I need to find a more permanent solution soon."
Customer Feeling: What is the customer Thinking?	Frustrated by the clutter and potential hazards.	Overwhelmed by the number of options and uncertain about their reliability.	Skeptical about the frequency and reliability of the events.	Mixed emotions—hopeful but anxious about the process and frustrated with the wait times.	I am frustrated and concerned about the growing clutter.
Process ownership: Who is the lead on this?	None (self-initiated).	None (self-initiated).	None (self-initiated)	Event organizers, Lisa as a participant.	None (self-initiated).
Opportunities	Provide awareness about easy recycling options and educate on the benefits of immediate action.	Create a centralized resource with reviews and comparisons of recycling options.	Provide a reliable and regularly updated schedule of events, with options for reminders.	Streamline the event process with efficient scheduling, minimize waiting times, and ensure clear instructions, quick service, and feedback opportunities.	Offer regular, on-demand recycling pickups to prevent accumulation.

[Environmental Advocates]: Advocates for environmental conservation and sustainability, focused on promoting responsible electronic waste disposal and recycling practices.

	"Every small action we take today can lead to a healthier planet tomorrow."	
	Needs and Goals: • To find convenient and reliable methods to recycle old electronic devices. • To contribute positively to environmental conservation. • Education of the importance of proper e-waste disposal..	Challenges: • Finding convenient recycling options. • Ensuring that recycled electronics are processed responsibly. • Accessing reliable information on e-waste management.
Background: • Age: 29 • Education: Bachelor's degree in environmental science • Hometown: Seattle, Washington • Family: Single, live with a pet dog • Occupation: Environmental Advocate	Summary: Mary Johnson, a 29-year-old environmental advocate from Seattle, is passionate about sustainable practices. Frustrated with the lack of convenient recycling options for her old electronic devices, she searches for a reliable solution. Upon discovering a new e-waste recycling app, she downloads it and schedules a pickup effortlessly. As she tracks the status of her recycled items and earns rewards for her efforts, Mary feels empowered and motivated to continue her environmental stewardship. The app not only simplifies her recycling process but also aligns with her values of transparency and community engagement.	

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a. Problem Statement

Mary Johnson is a 29-year-old environmental advocate who needs a convenient and transparent way to recycle her old electronic devices because she struggles with finding reliable recycling options and desires more information and rewards to stay motivated in her efforts to reduce e-waste.

b. As-is User Journey Map for Mary Johnson

	Awareness	Consideration	Decision and Preparation	Recycling and Tracking	Rewards, Education, and Reflection
Actions: What does the customer do?	Mary learns about e-waste recycling options through her environmental community group and local advertisements.	Mary research local recycling services, reads reviews, and checks their processes.	Mary decides to try a local recycling service she found through her research and prepares her old electronic devices for recycling.	Mary drops off her devices at the local recycling center or schedules a pickup and tries to track the status of her recycled items.	Mary reflects on her experience; shares feedback with her community and seeks rewards or educational content from the recycling service.
Touchpoints: What part of the service do they interact with?	Community group meetings, online forums, social media, local advertisements.	Websites of recycling services, online reviews, social media.	Recycling service websites, customer service, home.	Recycling center, pickup service, recycling service website, customer service.	Community group meetings, social media, online reviews, recycling service websites, emails.
Customer Thought: What is the customer thinking?	"I need to find a reliable way to recycle my old electronics."	"Which service can I trust to recycle my electronics responsibly?"	"I hope this service is reliable and easy to use. Am I preparing these devices correctly for recycling?"	"I hope this process goes smoothly and my devices are recycled properly. What is happening with my devices now?"	"It would be great to get some rewards or learn more about e-waste. I am glad I recycled, but the process could be better."
Customer Feeling: What is the customer Thinking?	Curious and hopeful.	Interested but cautious.	Optimistic but slightly overwhelmed.	Satisfied but still cautious, then frustrated and concerned.	Mixed feelings; satisfied with contributing to the environment but frustrated with the process.
Process ownership: Who is the lead on this?	Environmental community groups, local governments, environmental NGOs.	Recycling service providers, review platforms.	Customer, recycling service providers.	Recycling service providers, logistics companies..	Customer, environmental community groups, recycling service providers.
Opportunities	Increase visibility and awareness through targeted ads and educational campaigns.	Provide detailed information on recycling processes and certifications on websites.	Simplify the decision-making process with clear, concise information, positive customer testimonials, and step-by-step instructions for device preparation.	Ensure a smooth, convenient drop-off or pickup process, provide immediate confirmation of receipt, and offer real-time tracking updates and transparent information on the recycling process.	Introduce a rewards program, provide educational content on e-waste management and environmental impact, gather feedback to improve the service, and encourage community engagement through positive experiences.

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[General Consumers]: Individuals with old electronic devices that need disposal, looking for convenient and cost-effective ways to handle these devices.

	"Recycling shouldn't be a hassle; it should be as easy as taking out the trash."	
	Needs and Goals: - To find a convenient and efficient way to recycle old electronics. - To contribute positively to environmental sustainability. - To save money by purchasing quality refurbished electronics.	Challenges: - Lack of convenient recycling options. - Inconvenience and effort required for existing recycling services. - Uncertainty about the environmental impact of his actions.
Background: - Age: 45 - Occupation: Office Worker - Education: Bachelor's degree in psychology - Hometown: Portland, OR - Family: Married with three children	Summary: John, a 45-year-old office worker from Portland, is determined to manage his old electronic devices responsibly. The lack of convenient recycling options leads him to store these devices at home. Frustrated by the inconvenience, he dreams of an app that allows easy scheduling of pickups, tracks the recycling process, and offers discounts on refurbished products. This app would help him declutter and show his children the importance of environmental responsibility.	

a. Problem Statement

John Smith is a 45-year-old office worker and father of three who needs a convenient and efficient way to recycle his old electronics because current e-waste recycling options are inconvenient and require too much effort, causing him to store the devices instead of disposing of them responsibly.

b. As-is User Journey Map for John Smith

	Realization	Search for Solutions	Evaluation	Decision to Store	Long-term Inaction
Actions: What does the customer do?	John recognizes he has old electronic devices that he no longer uses	John searches online for e-waste recycling options.	John evaluates different recycling services but finds them inconvenient.	John decides to continue storing the old electronics due to lack of convenient options.	John keeps the old electronics stored, feeling frustrated about not finding a better solution.
Touchpoints: What part of the service do they interact with?	Home storage areas	Search engines, websites of recycling services	Websites, online reviews	Home storage areas	Home storage areas
Customer Thought: What is the customer thinking?	"I need to get rid of these old electronics; they're just taking up space."	"There must be a better way to recycle these electronics."	"These options are too complicated or far away."	"I'll just keep these for now until I find a better solution."	"This problem isn't going away, but I don't know what else to do."
Customer Feeling: What is the customer Thinking?	Overwhelmed by the clutter	Hopeful but skeptical	Frustrated and discouraged	Defeated and resigned	Persistent frustration and guilt
Process ownership: Who is the lead on this?	John himself	John himself	John himself	John himself	John himself

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Opportunities	Educate John about e-waste issues and provide awareness about convenient recycling options.	Ensure prominent visibility of easy-to-use recycling services online.	Highlight the ease and convenience of using a specialized e-waste management app.	Reinforce the importance of responsible disposal and the benefits of using the app.	Offer a seamless, incentivized process through the app, providing step-by-step guidance and clear benefits.
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4. Value proposition

a. Cost Savings

- **Affordable Prices:** Offering high-quality refurbished electronics at significantly lower prices compared to new products.
- **Cash-Back and Trade-In Options:** Providing users with opportunities to trade in their old devices for cash or credit towards future purchases.

b. Quality Assurance

- **Certified Refurbished:** Ensuring that all products go through rigorous testing and certification processes to guarantee performance and reliability.
- **Warranty and Returns:** Providing warranties and easy return policies to build trust and ensure customer satisfaction.

c. Environmental Impact

- **Sustainability:** Promoting eco-friendly practices by reducing e-waste through refurbishing and reselling electronics.
- **Transparency in Recycling:** Offering detailed information on the recycling process, reinforcing the app's commitment to environmental responsibility.

d. Convenience

- **User-Friendly Interface:** Featuring a seamless and intuitive app interface for easy browsing, purchasing, and managing orders.
- **Easy Scheduling for Pickups:** Allowing users to schedule pickups for recycling their old electronics, making the process hassle-free.

e. Variety and Selection

- **Wide Range of Products:** Offering a diverse selection of refurbished electronics, including smartphones, laptops, tablets, and more.
- **Up-to-Date Inventory:** Regularly updating the inventory with the latest models and popular brands.

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f. Customer Support

- Responsive Customer Service: Providing robust customer support to assist with inquiries, troubleshooting, and after-sales service.
- Educational Resources: Offering guides, tips, and information on extending device life and making informed purchasing decisions.

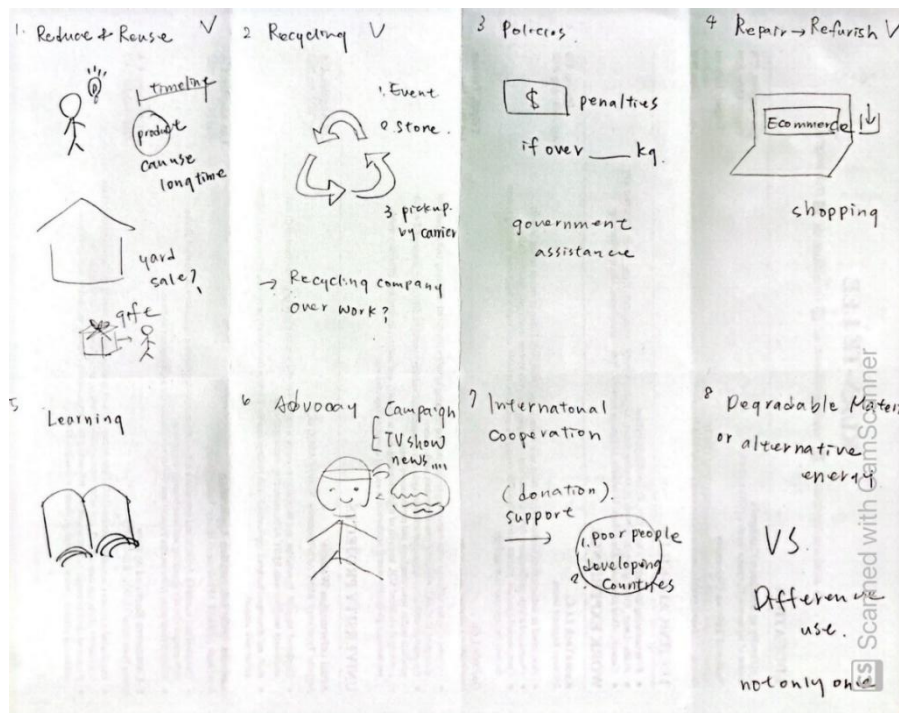
g. Incentives and Rewards

- Discounts and Promotions: Consistently offering discounts, promotions, and loyalty programs to encourage repeat purchases.
- Environmental Impact Tracking: Allowing users to track the positive environmental impact of their purchases and recycling activities, fostering a sense of contribution and responsibility.

Starting the design

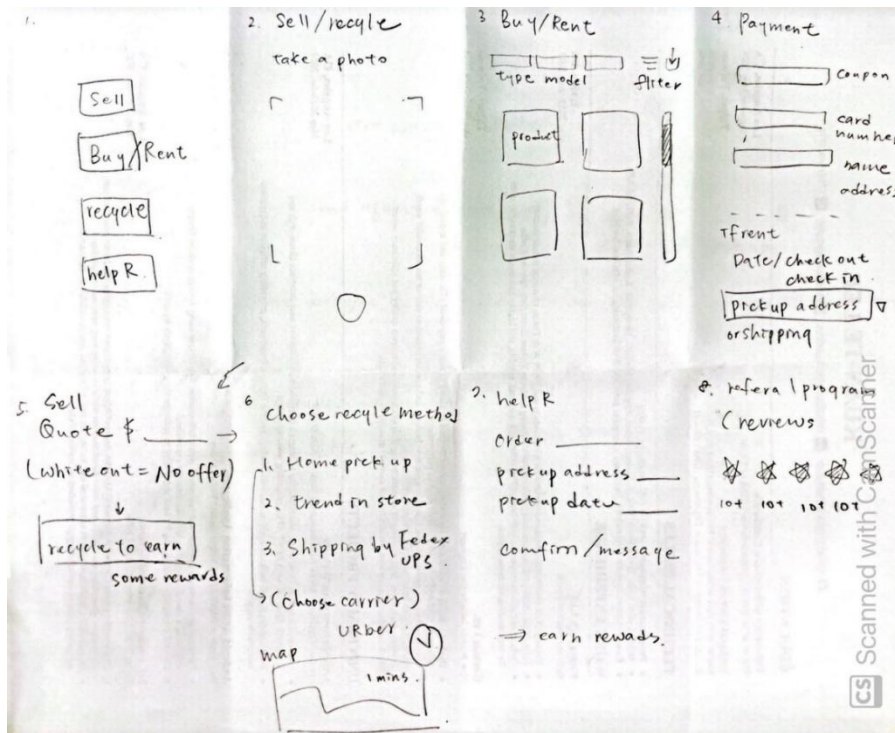
1. Sketch & Idea Note

a. Brainstorm Design

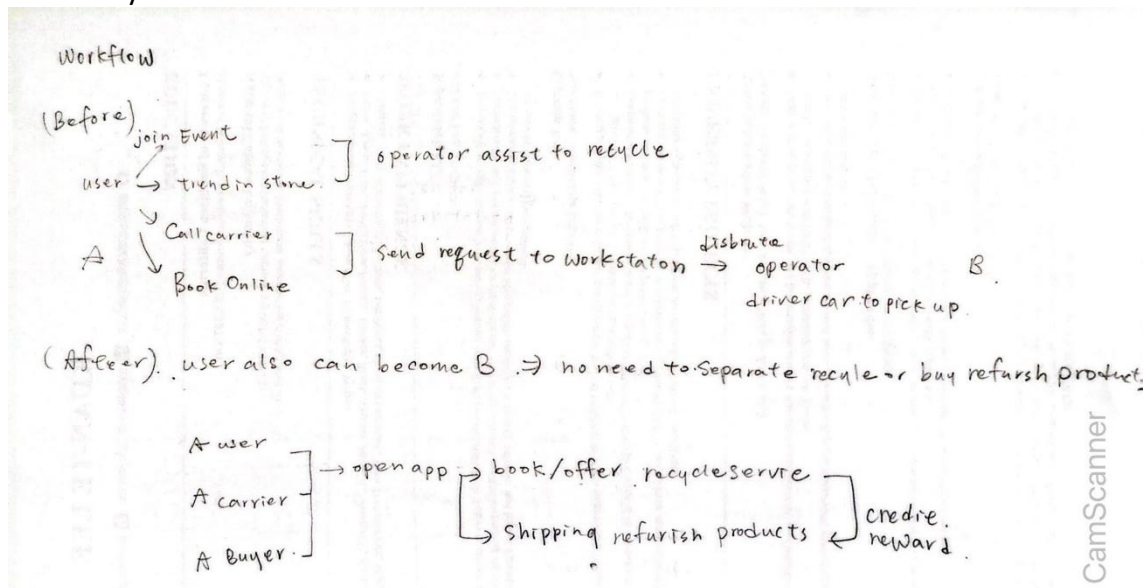


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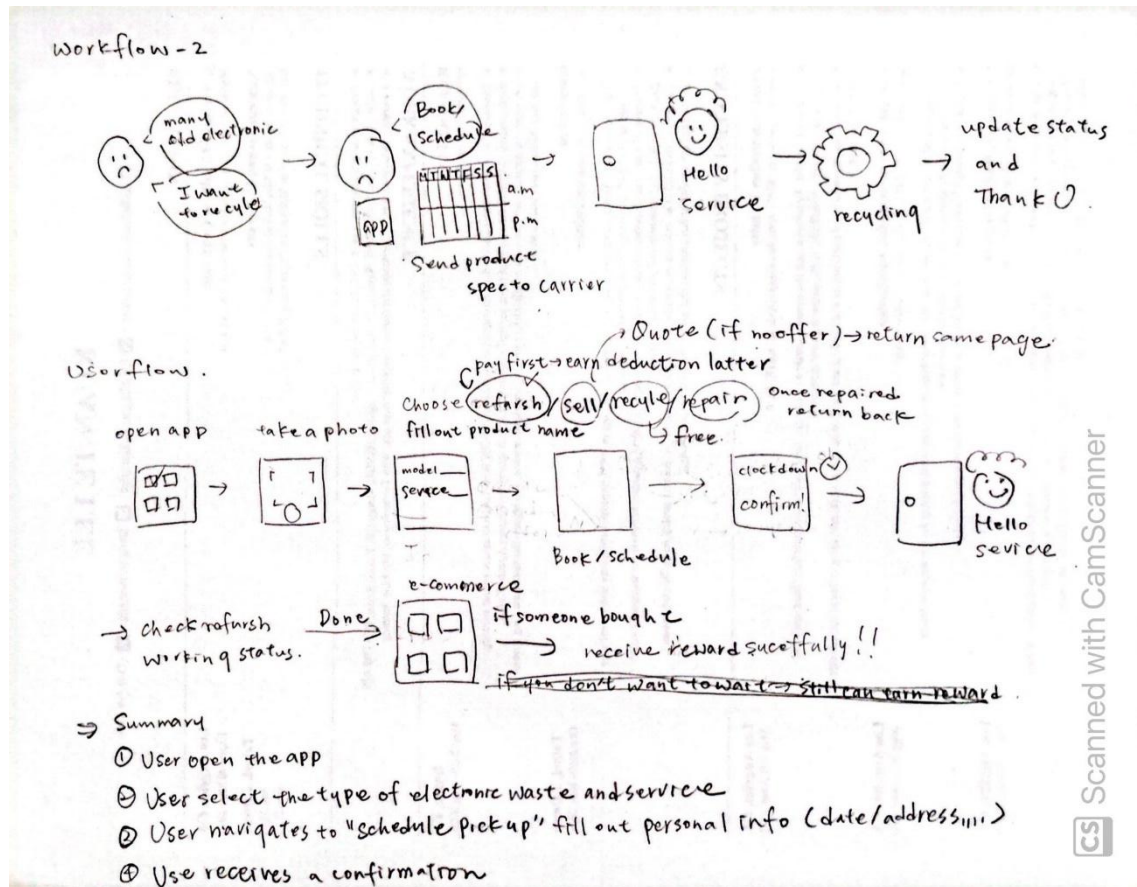


b. User storyboard



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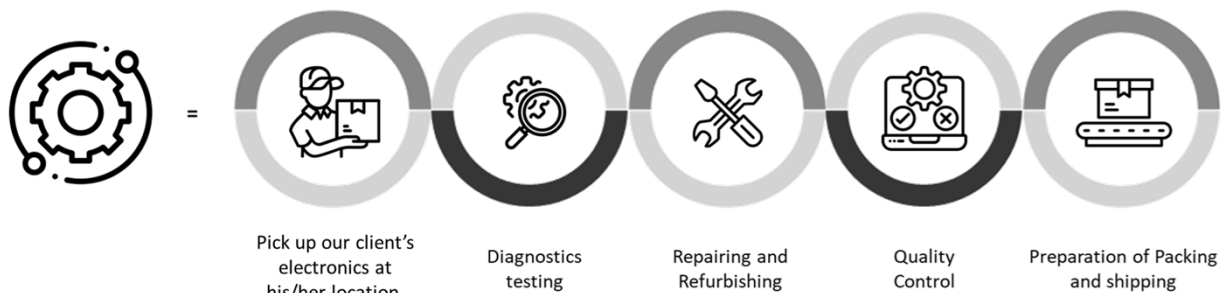
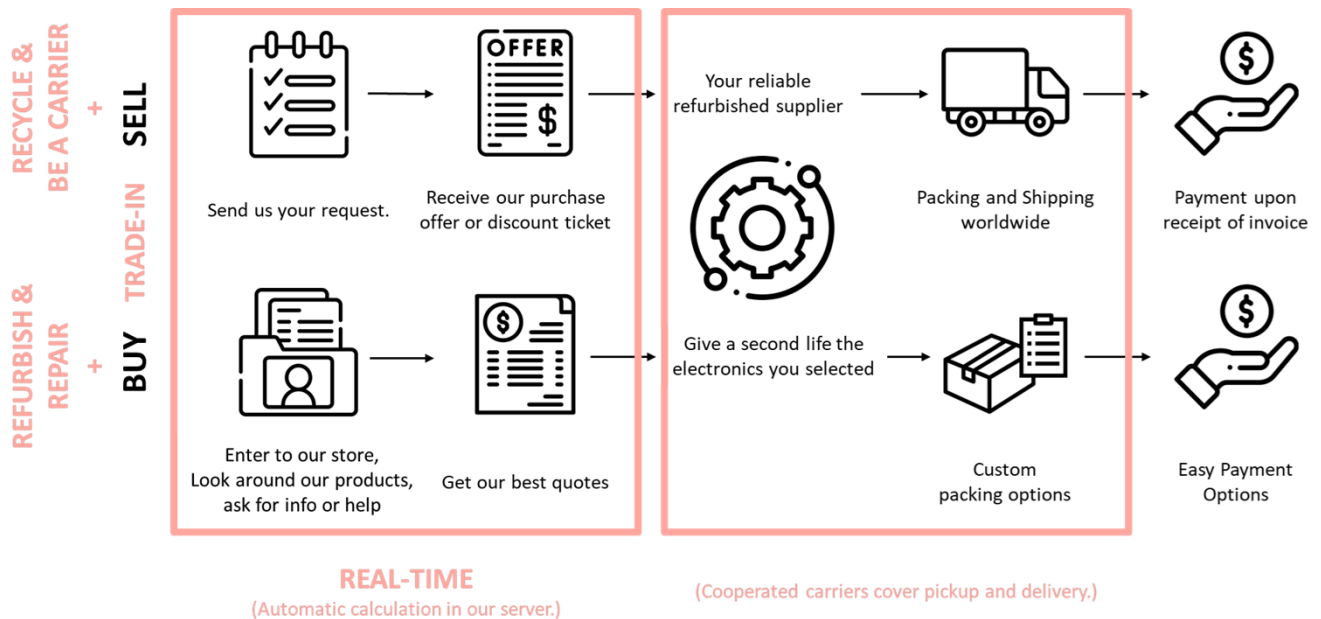
2. Workflow & User Flow

Aspect	Workflow	User Flow
Scope	Broad, covering processes and interactions	Specific, covering user navigation and tasks
Focus	Process efficiency and task management	User experience and task completion
Details	Includes all steps, roles, and systems involved	Includes user actions, decisions, and steps
Application	Often used for operational and administrative tasks	Often used for designing and optimizing user experiences
Example	For a recycling app, a workflow might describe the steps involved in scheduling pickup, processing the electronic waste, and tracking the recycling progress. (1) User requests a pickup. (2) System schedules the pickup and sends confirmation. (3) Pickup service collects the item. Item is transported to a recycling facility. (4) Facility processes the item and updates the status. (5) Users receive an update and a thank-you note.	For the same recycling app, a user flow might show how a user schedules a pickup: (1) User opens the app. (2) User navigates to the “Schedule Pickup” page. (3) Users select the type of electronic waste. (4) User chooses a date and time for pickup. (5) User enters pickup address and confirms details. (6) Users receive a confirmation message and tracking number.

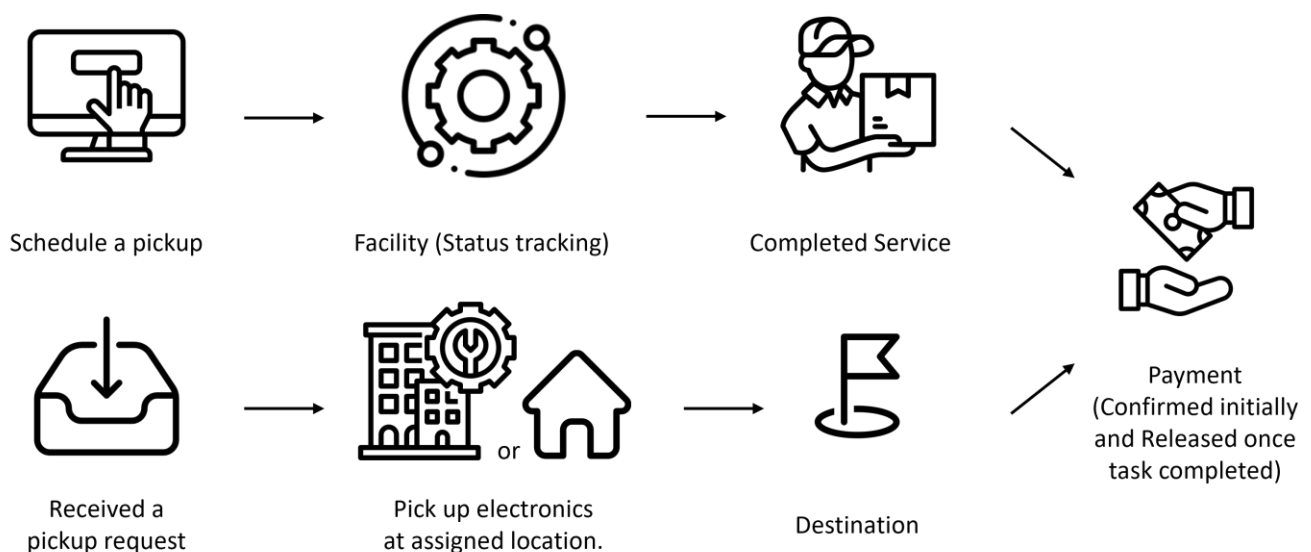
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(Workflow concept)



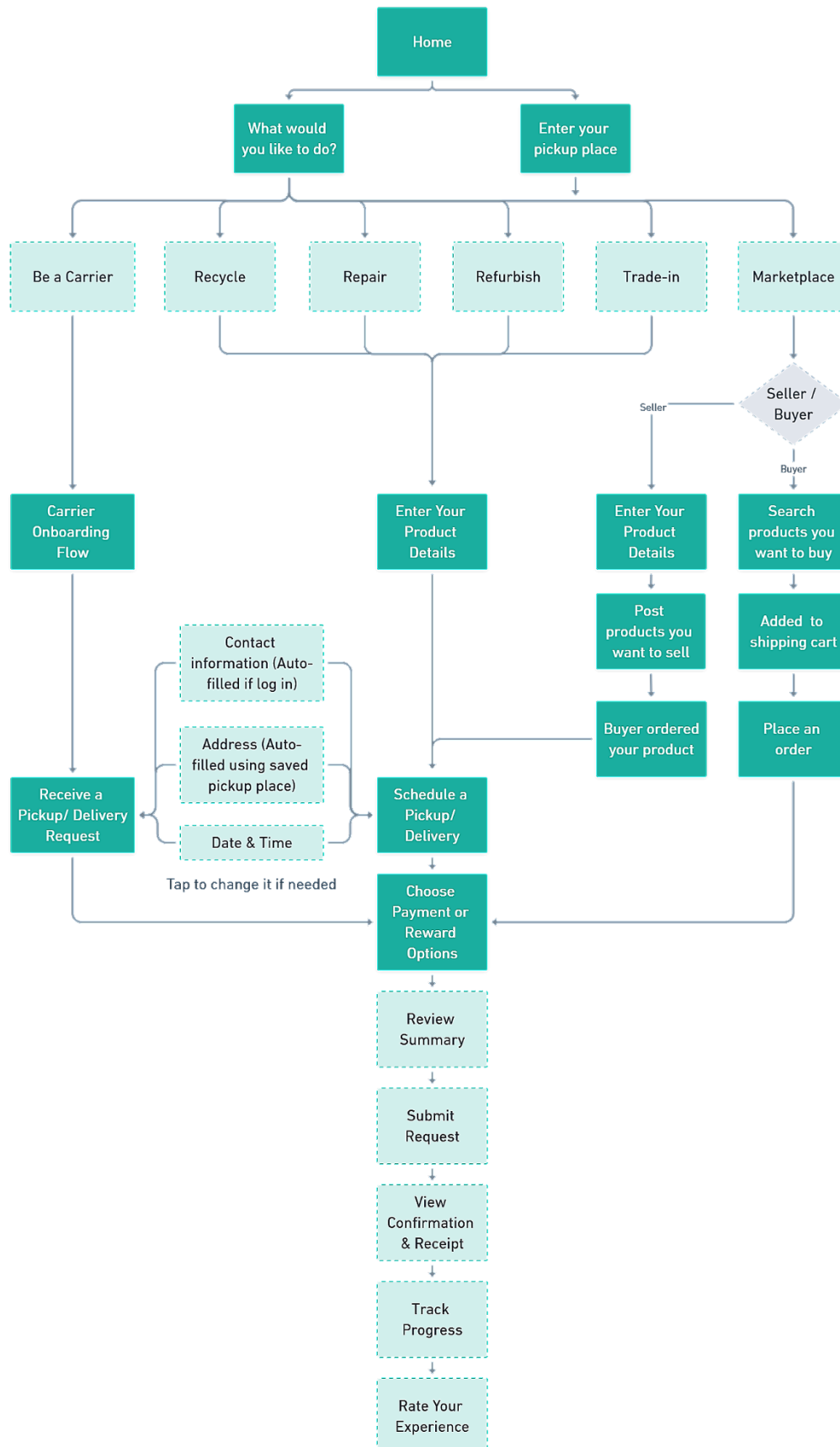
(Refined and Defined Workflow: "Real-time" implementation)



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(Refined and Defined User flow)



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a. User Flow for the Else Services

Type	Trade-In/ Recycle	Repair	Refurbish
	Step 1: Select Items for Trade-In: - User selects items for trade-in. - Receive an estimated trade-in value. Step 2: Purchase New Product: Apply trade-in discount at checkout. Step 3: Shipping: Schedule pickup of the trade-in items.	Step 1: Request Repair: - User describes the issue and selects the device. - Option to upload images and describe the problem. - Schedule a pickup. Step 2: Diagnosis and Estimate: - Technician provides a diagnosis and cost estimate. - User approves or declines the repair. Step 3: Repair and Return: - Device repaired. - Schedule return delivery or pickup.	Step 1: List Item: - User provides details and images of the item. - App owner assists in listing the item on the marketplace. Step 2: Sale and Reward: - Item listed for sale. - User earns reward points or cashback once the item is sold.
	Marketplace	Carrier	
	Step 1: List Item for Sale: - User provides details, images, and price. - Item listed on the marketplace. Step 2: Manage Sales: - User tracks offers and sales. - Manages communication with buyers. Step 3: Shipping: Schedule pickup or shipping once sold.	Step 1: Register as Carrier: User registers as a carrier and completes verification. Step 2: Accept Deliveries: - Browse available delivery requests. - Accept and schedule deliveries. Step 3: Delivery and Earnings: - Complete deliveries. - Earn delivery fees and ratings.	

b. Summary User Action

Service	Purpose	User Action	Outcome
Trade-In	Trade old electronics for discounts on new purchases	Get trade-in estimate, choose new product, schedule pickup	Discount applied; old item collected
Recycle	Dispose of electronics responsibly	Schedule pickup/drop-off for e-waste	Items are recycled; user gets rewards
Repair	Fix malfunctioning or broken electronics	Describe issue, schedule service, approve estimate	Item is repaired and returned
Refurbish	Restore used electronics to sell	Send item for refurbishment, approve estimate	Item is refurbished and listed for sale
Marketplace	Sell used electronics directly	List item, manage offers, handle transaction	Item is sold; user receives payment
Delivery	Enable users to become carriers and deliver items	Register as carrier, accept delivery requests, complete delivery	Carrier gets paid for deliveries

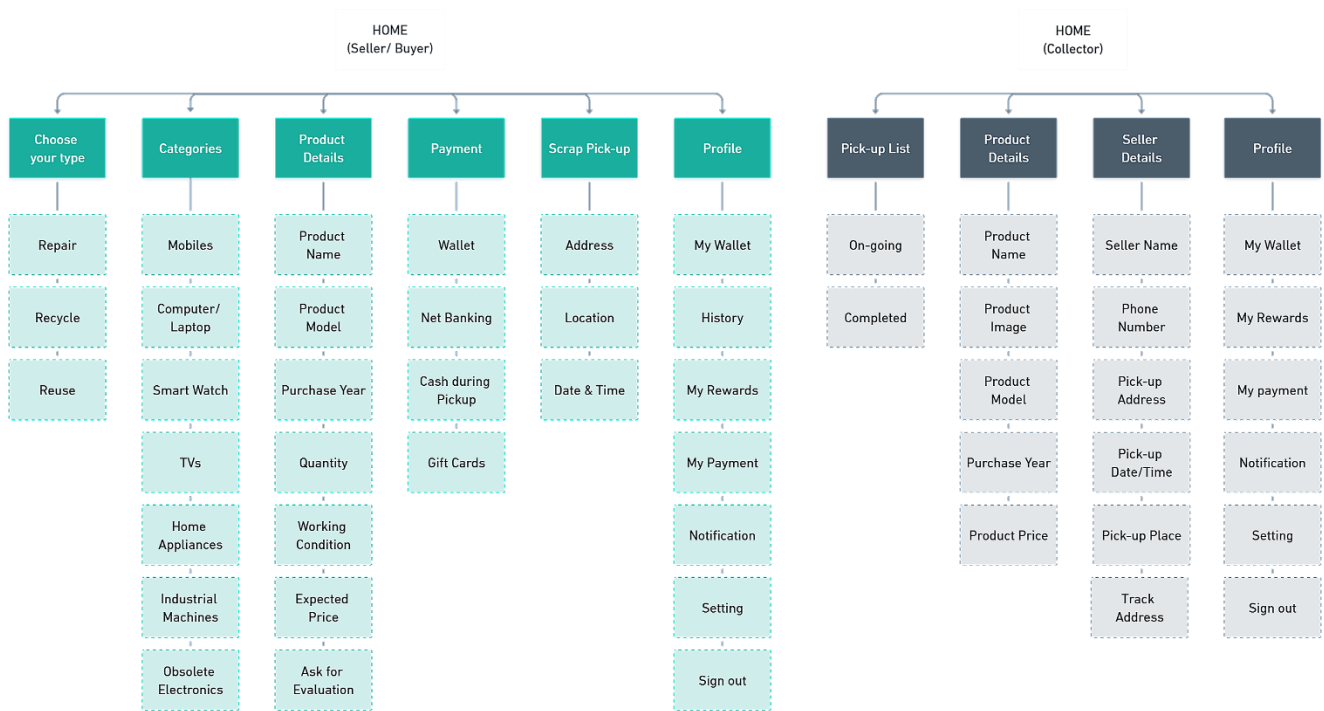
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3. Information Architecture (UX Design-side)

(Note: React Native Folder Structure (Markdown Tree View) is for Frontend-side)

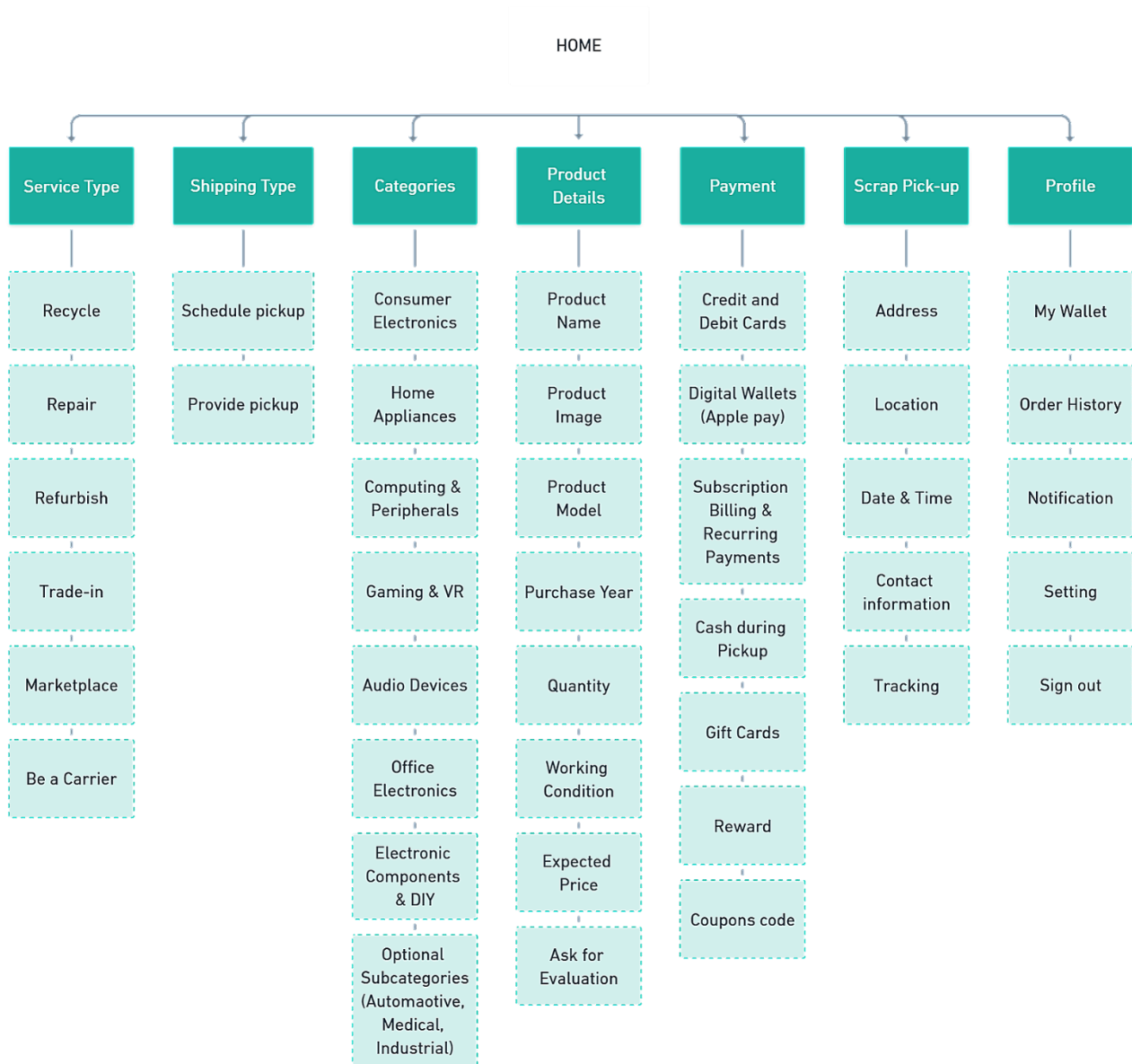
a. Before:



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b. After:



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c. Comparison and Summary:

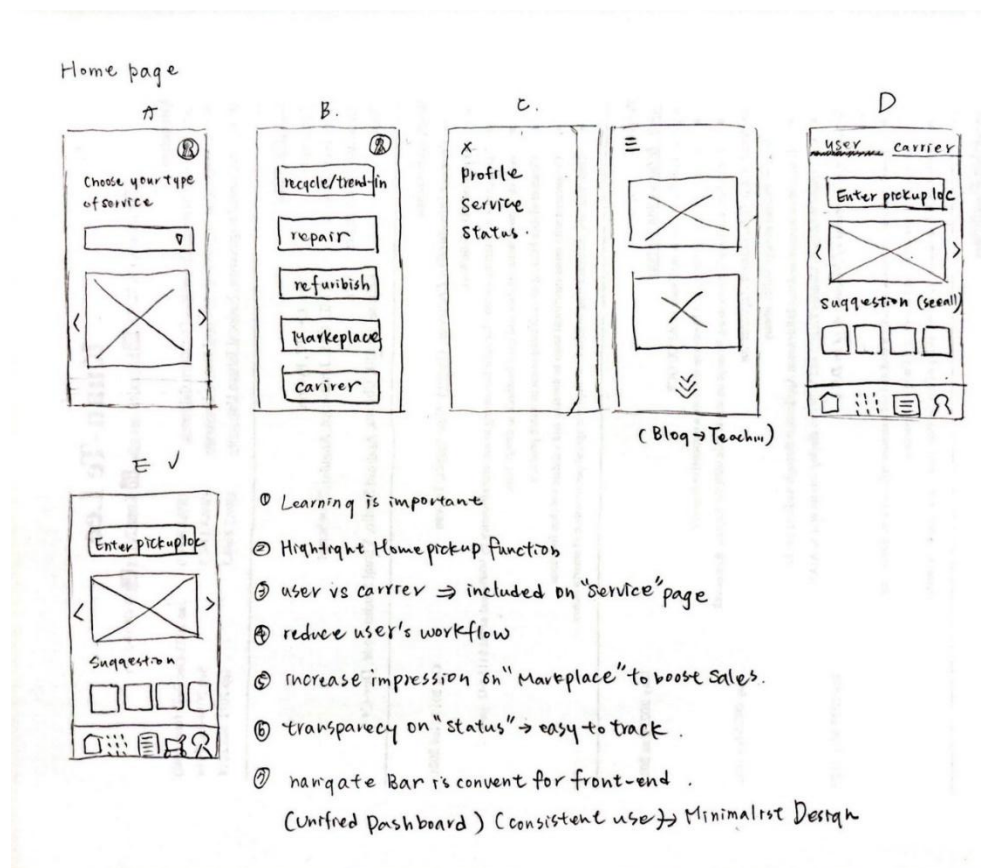
● Strengths & Weaknesses

Aspect	Original Version	Refined Version
✓ Role-based clarity	Strong	Weak
✓ Feature richness	Moderate	Strong
✓ E-commerce/Marketplace readiness	Weak	Strong
✓ Modern payment options	Weak	Strong
✓ Flexibility for new features	Moderate	Strong
✗ User onboarding simplicity	Moderate (Role complexity)	Strong (Unified)
✗ Role switching support	Needs more integration	Easily extendable

● Efficiency Evaluation

Metric	Original Version	Refined Version
Task Completion Time	🔴 Moderate — role switching adds steps	🟢 Faster — streamlined, role-agnostic
Ease of Use	🟢 Good for first-timers (guided by role)	🟢 Better for multi-service users (flexible)
Learning Curve	🟢 Clear roles help new users	🔴 Slightly complex, but more consistent
Feature Scalability	🔴 Slower — need full role trees	🟢 Easier — same structure
Developer Maintenance	🔴 More duplication	🟢 Shared components = easily maintain

4. Paper wireframes (with Usability Study – Home Page of Second-life App)

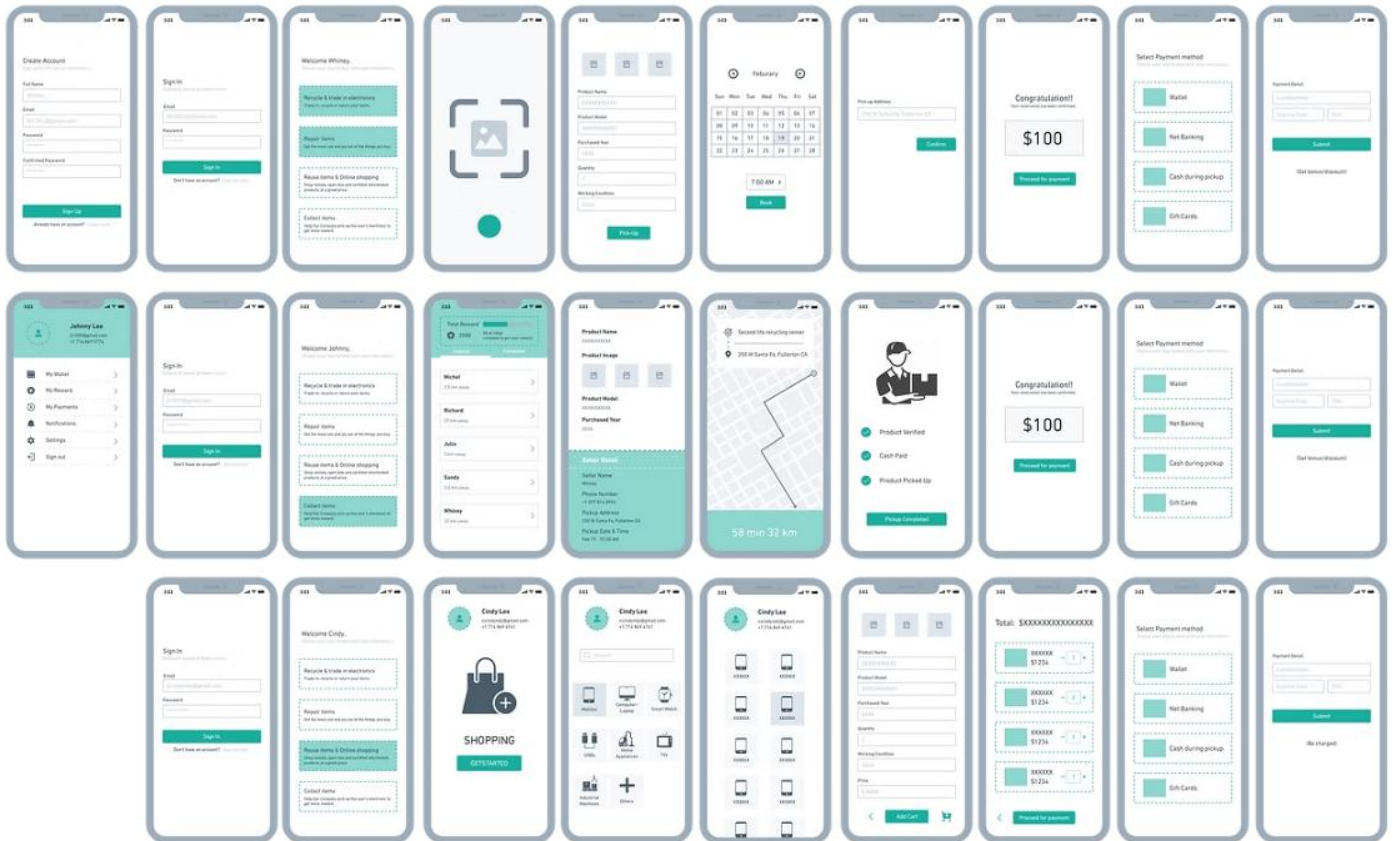


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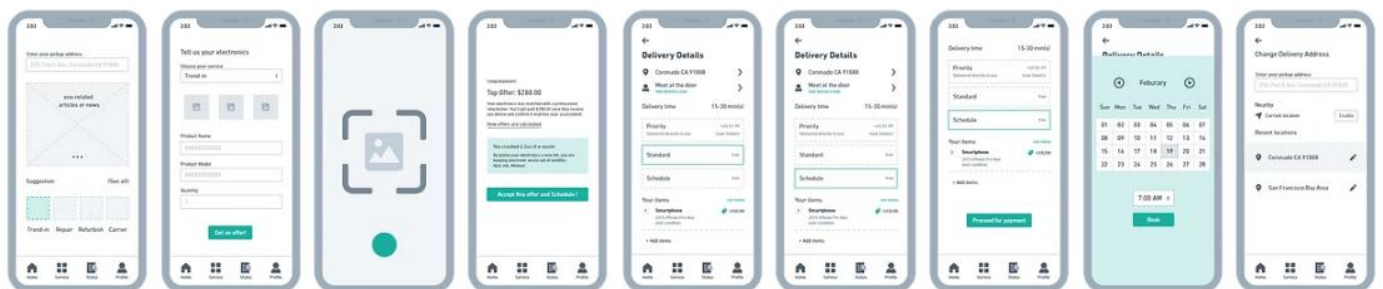
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5. Low-Fidelity Digital wireframes (with Comparative Usability Testing – B Version vs E Version Wireframes)

a. B version



b. E version (Listed difference only)

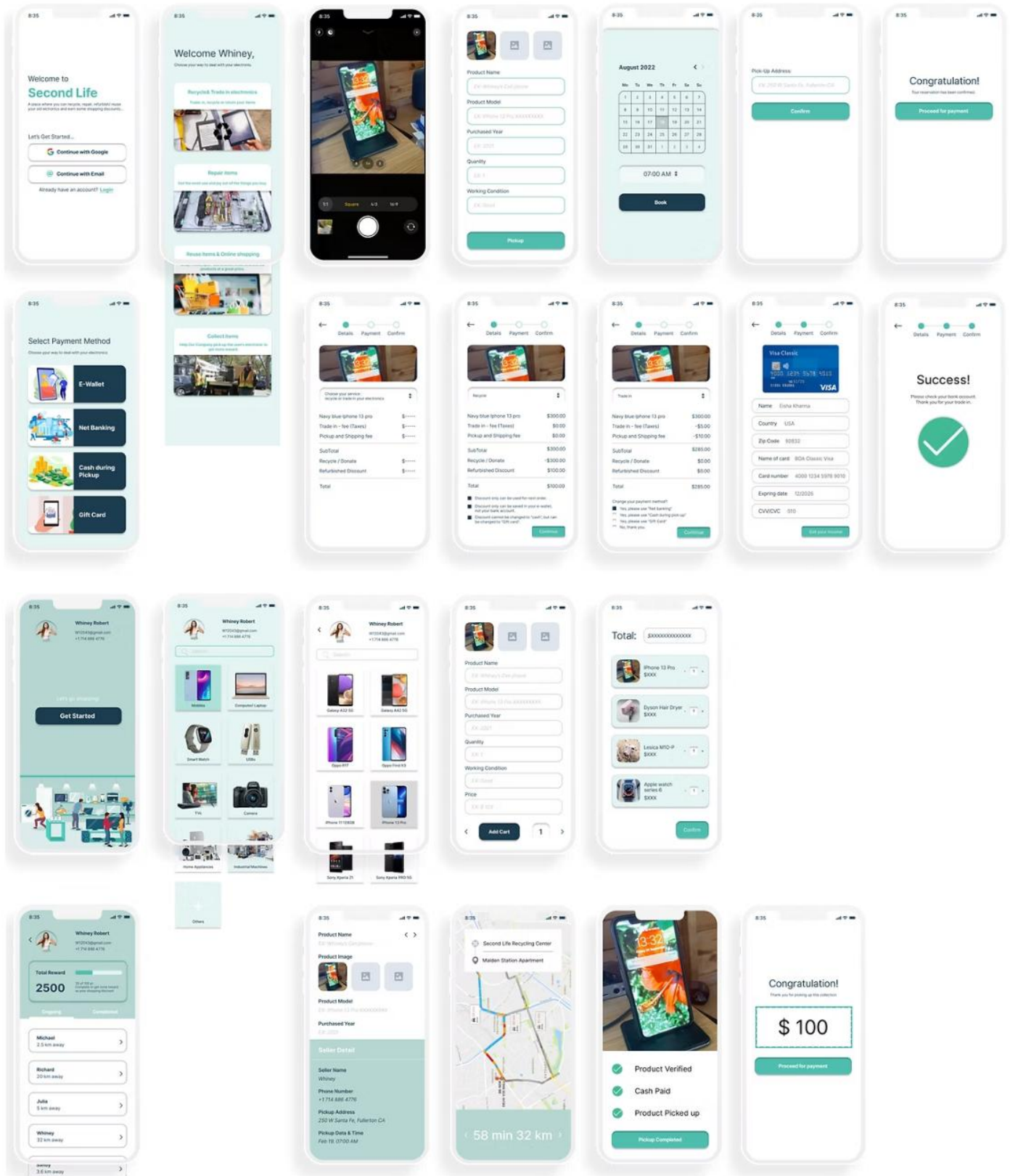


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6. Mid-Fidelity Mockup with prototype

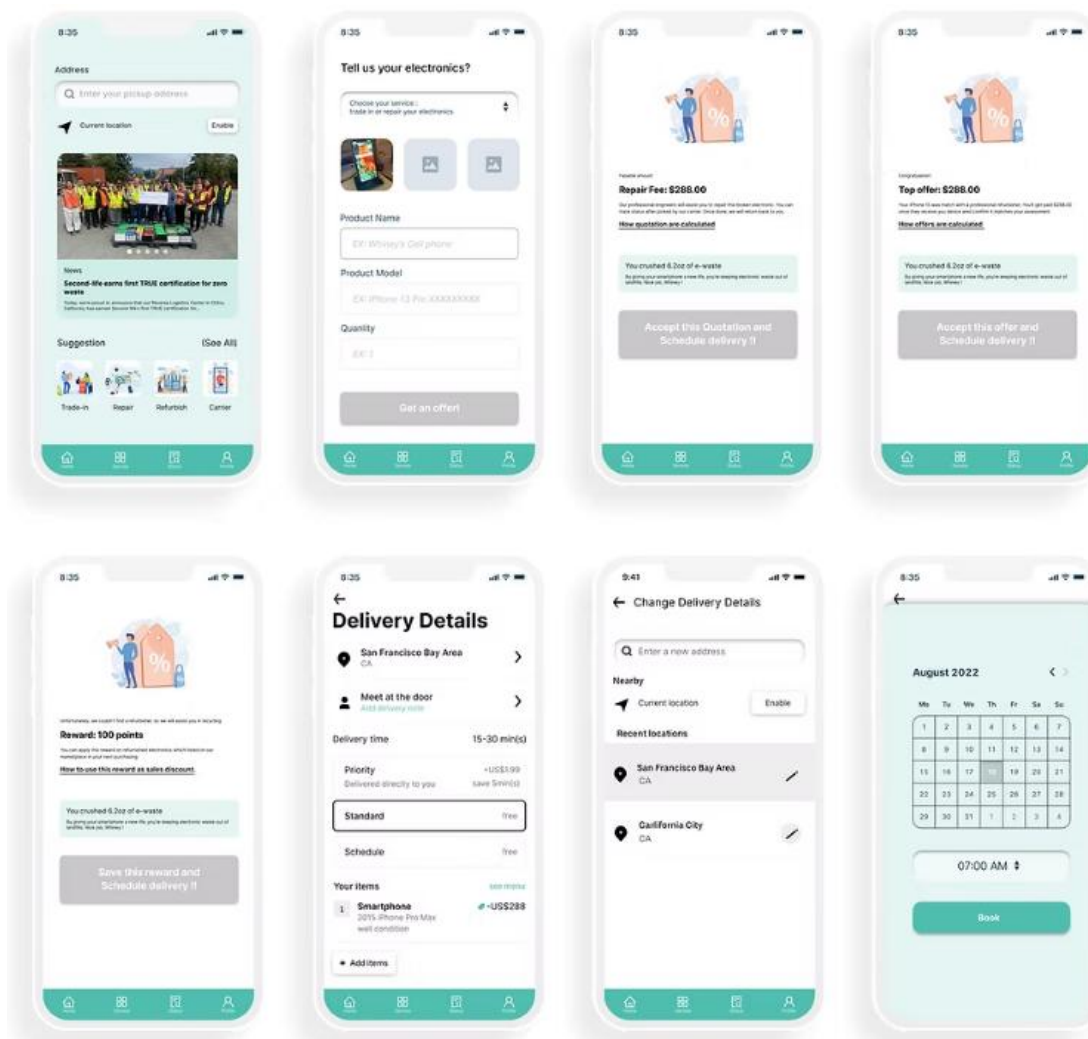
a. B version



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b. E version (Listed difference only)



The usability testing of the Second-life app wireframes—comparing B and E versions—revealed clear differences in user efficiency, satisfaction, and task flow clarity. Across seven participants with varied backgrounds, the E version consistently outperformed the B version in terms of task completion speed, navigation ease, and overall user preference. Participants appreciated the E version’s streamlined scheduling flow that begins with entering an address, aligning with natural user behavior and reducing cognitive load. The bottom navigation bar, article section, and clear visual hierarchy also contributed to faster orientation and stronger engagement, particularly for returning users or those familiar with sustainable practices. In contrast, while the B version’s step-by-step structure and large buttons offered clarity for first-time users, its linear flow introduced friction—especially due to delayed address input and the lack of dynamic content. Users expressed frustration when required to backtrack or re-enter data, which the E version handled more smoothly through editable scheduling fields and visible confirmation steps. Overall, the E version demonstrated stronger usability across the entire app—not just the home page—by better supporting user autonomy, task efficiency, and environmental value alignment, making it the preferred direction for final iteration and refinement.

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Developing Frameworks with iterations (in progress)

1. Design System Implementation

- a. Color Palette: Defined a soft, eco-conscious palette to reflect the brand’s environmental values. Each color serves a clear purpose in UI hierarchy.

Color Name	Hex Code	Usage
Primary	#4DC5B8	Primary actions, buttons, highlights
Soft Mint	#E7F4F3	Backgrounds, cards, soft surfaces
News Highlight	#D7F0ED	News cards or awareness content
Background	#FFFFFF	App screen base
Text Primary	#1F2937	Main headings and readable content
Text Subtle	#666666	Hints, helper text, labels
Border / Shadow	#E5E7EB / rgba(0,0,0,0.1)	Light dividers and shadows
Surface / Cards	#FAFAFA / #F5F5F5	Elevation, surface contrast
Success	#4CAF50	Success states, confirmations
Danger	#EF4444	Warnings, destructive actions
Error	#D32F2F	Input validation, error toasts

- b. Typography: Used a clean, modern sans-serif font stack for clear readability on mobile. Font sizes and weights are tokenized for consistent application across the UI.

Text Style	Font Size	Weight	Usage
Heading	24	Bold	Page titles, cards
Body	16	Regular	Standard paragraph text
Label	14	Medium	Form fields, captions
Step	16	Medium	Instructions, CTAs

(Font Family: -apple-system, Helvetica Neue, Arial, sans-serif)

- c. Spacing System: Spacing tokens bring structure and rhythm to all UI layouts. They are applied consistently in padding, margin, and layout grids.

Token	Value (px)	Purpose
xs	4	Fine-tuning spacing
sm	8	Between components
md	16	Standard padding
lg	24	Section gaps
xl	32	Major group spacing
xxl	40	Hero / top spacing

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- d. **Border Radius:** Rounded corners provide a modern and approachable feel. Tokens ensure reusable radii across components.

Token	Value	Usage
sm	4	Small buttons or chips
md	8	Cards, containers
lg	16	Large surfaces like modals
full	9999	Circular avatars, pill buttons

- e. **Button Variants:** Buttons are built using consistent padding, radius, and color styles, optimized for touch accessibility.

Primary Button	Secondary Button
Background: #4DC5B8	Background: #FFFFFF
Text Color: #FFFFFF	Border: 1px solid #4DC5B8
Font Weight: Semi Bold	Text Color: #4DC5B8
Full radius for pill shape	

- f. **Layout Utilities:** Defined layout utility objects reused across components to keep code maintainable and flexible.

```
rowSpaceBetween = {  
  flexDirection: 'row',  
  justifyContent: 'space-between',  
}
```

```
rowCenter = {  
  flexDirection: 'row',  
  justifyContent: 'center',  
  alignItems: 'center',  
}
```

- g. **Image Styling:** All preview or marketplace images are styled responsively for mobile screens.

```
image.preview = {  
  width: screenWidth,  
  height: 200,  
  border Radius: 8,  
  margin Vertical: 8,}
```

- h. **Shadow:** Use light shadows to give components subtle elevation and separation from background layers.

```
shadow.default = {  
  shadowColor: 'rgba(0, 0, 0, 0.1)',  
  shadowOffset: { width: 0, height: 2 },  
  shadowOpacity: 0.1,  
  shadowRadius: 4,  
  elevation: 3,}
```

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i. Technologies Used

- React Native (with TypeScript)
- Design Tokens code as constants.
- Atomic + Utility-first styling patterns

2. Markdown Tree View:

(Initial V0)

```
src /
├── App.tsx
├── design-system.ts
├── types.ts
├── assets /
│   ├── data
│   │   ├── newsData.ts
│   │   └── forms
│   │       ├── AppointmentForm.tsx
│   │       ├── CarrierSignupForm.tsx
│   │       ├── MarketplaceForm.tsx
│   │       ├── Step1_PersonalInfo.tsx
│   │       ├── Step2_UploadDocs.tsx
│   │       └── Step3_Verification.tsx
│   └── icons
├── navigation /
│   ├── AppNavigator.tsx
│   └── ModalStack.tsx
├── components /
│   ├── AddressInput.tsx
│   ├── MapScreen.tsx
│   ├── NewsCarousel.tsx
│   └── SuggestionGrid.tsx
├── screens /
│   ├── HomeScreen.tsx
│   ├── ServiceScreen.tsx
│   ├── StatusScreen.tsx
│   ├── ProfileScreen.tsx
│   ├── RecycleScreen.tsx
│   ├── RefurbishScreen.tsx
│   ├── RepairScreen.tsx
│   ├── TradeInScreen.tsx
│   ├── CarrierDashboardScreen.tsx
│   ├── CarrierHistoryScreen.tsx
│   ├── CarrierMapScreen.tsx
│   ├── CarrierNearbyPickupCase.tsx
│   ├── CarrierScreen.tsx
│   ├── CarrierWalletScreen.tsx
│   ├── MarketplaceScreen.tsx
│   ├── NewsDetail.tsx
│   ├── SummaryScreen.tsx
│   ├── ConfirmationScreen.tsx
│   ├── RewardOptionsScreen.tsx
│   ├── FeedbackScreen.tsx
│   ├── TrackStatusScreen.tsx
│   ├── OrderHistoryScreen.tsx
│   ├── WalletScreen.tsx
│   └── WithdrawScreen.tsx
└── utils /
    ├── haversine.tsx
    └── location.tsx
```

Path	Purpose
0 src/	General or uncategorized logic
1 src/assets/data/	Static or mock data
2 src/assets/forms/	Multi-step service forms
3 src/components/	HomeScreen UI components
4 src/navigation/	Routing and navigation configuration
5 src/screens/	Page-level screens
6 src/utils/	Helper functions and utility logic

(Updates V1)

```
src /
├── App.tsx
├── design-system.ts
├── ProviderTree.tsx
├── types.ts
├── assets /
│   ├── data
│   │   ├── newsData.ts
│   │   └── forms
│   │       ├── AppointmentForm.tsx
│   │       ├── MarketplaceForm.tsx
│   │       └── Carrier
│   │           ├── CarrierSignupForm.tsx
│   │           ├── Step1_PersonalInfo.tsx
│   │           ├── Step2_UploadDocs.tsx
│   │           └── Step3_Verification.tsx
│   ├── icons
│   └── images
├── components /
│   ├── Section.tsx
│   ├── PrimaryButton.tsx
│   ├── MapScreen.tsx
│   ├── AddressInput.tsx
│   ├── NewsCarousel.tsx
│   ├── SuggestionGrid.tsx
│   ├── SearchBarWithDropdown.tsx
│   └── MarketplaceCard.tsx
├── context /
│   ├── index.ts
│   ├── UserContext.tsx
│   ├── WalletContext.tsx
│   ├── OrderHistoryContext.tsx
│   ├── RecycleContext.tsx
│   ├── RefurbishContext.tsx
│   ├── RepairContext.tsx
│   ├── TradeInContext.tsx
│   ├── CarrierContext.tsx
│   └── MarketplaceContext.tsx
├── navigation /
│   ├── AppNavigator.tsx
│   └── ModalStack.tsx
```

```
├── screens /
│   ├── Home
│   │   ├── HomeScreen.tsx
│   │   └── NewsDetail.tsx
│   ├── Service
│   │   ├── ServiceScreen.tsx
│   │   └── Carrier
│   │       ├── CarrierDashboardScreen.tsx
│   │       ├── CarrierScreen.tsx
│   │       ├── CarrierHistoryScreen.tsx
│   │       ├── CarrierMapScreen.tsx
│   │       ├── CarrierNearbyPickupCase.tsx
│   │       └── CarrierWalletScreen.tsx
│   ├── Marketplace
│   │   ├── MarketplaceScreen.tsx
│   │   └── MarketplaceDetailScreen.tsx
│   ├── RequestServices
│   │   ├── RecycleScreen.tsx
│   │   ├── RefurbishScreen.tsx
│   │   ├── RepairScreen.tsx
│   │   └── TradeInScreen.tsx
│   ├── Settlement
│   │   ├── ConfirmationScreen.tsx
│   │   ├── FeedbackScreen.tsx
│   │   ├── RewardOptionsScreen.tsx
│   │   └── SummaryScreen.tsx
│   ├── Status
│   │   ├── ServiceStatusSummaryScreen.tsx
│   │   ├── ServiceLiveMapScreen.tsx
│   │   └── ServiceTimelineScreen.tsx
│   ├── Profile
│   │   ├── ProfileScreen.tsx
│   │   └── OrderHistoryScreen.tsx
│   └── Wallet
│       ├── WalletScreen.tsx
│       └── WithdrawScreen.tsx
└── utils /
    ├── haversine.tsx
    └── location.tsx
```

	Path	Purpose
0	src/	Main source directory for app code.
1	App.tsx	Entry point of the app; initializes navigation and providers.
2	ProviderTree.tsx	Wraps app with all global context providers.
3	design-system.ts	Defines colors, spacing, and styles used app-wide.
4	types.ts	Centralized TypeScript type definitions.
5	src/assets	Stores static assets like images, icons, and form modules.
6	src/components/	Reusable UI components and widgets.
7	src/context/	App-wide state management using Context API.
8	src/navigation/	Manages screen stacks and modal navigation.
9	src/screens/	All screen-level UI, grouped by feature or user role. (e.g., Home, Service, Status, Profile)
10	src/utils/	Helper functions and utility logic

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(Architecture Review - User Flow Alignment)

Step	Screen Implemented	Matched to User flow	Notes
1 Select service on Home	✓ HomeScreen + SuggestionGrid	✓ Yes	User can select from services
2 Enter pickup place	✓ AddressInput in AppointmentForm	✓ Yes	Pulled from navigation or user
3 Input product condition	✓ AppointmentForm.tsx (camera & gallery)	✓ Yes	Can upload product photos
4 Schedule pickup	✓ DateTimePicker in AppointmentForm	✓ Yes	Time selection built in
5 Review summary	✓ SummaryScreen.tsx	✓ Yes	Shows selected service, image, address, date
6 Choose reward	✓ RewardOptionsScreen.tsx	✓ Yes	Options: Cash / Credit / Donate
7 Submit confirmation	✓ ConfirmationScreen.tsx	✓ Yes	Final confirmation page
8 Track progress	✓ TrackStatusScreen.tsx	✓ Yes	Shows milestone updates
9 Rate experience	✓ FeedbackScreen.tsx	✓ Yes	Rating and comment field
10 Carrier flow	✓ Carrier, CarrierDashboardScreen, Wallet etc.	✓ Yes	Integrated into ServiceStackParamList
🛒 Marketplace flow	✓ MarketplaceScreen.tsx + forms	✓ Yes	Allows user to browse/sell

3. High- Fidelity React Native UI Section Breakdown. V1

Only show summary details (The demo is available at <https://github.com/cicindyndy/SecondLife.git>.)

Main Screen/Module	Functional Role	State & Navigation	Context Integration	UI Components	Optimizations	Accessibility
Home	Entry point with service shortcuts and dynamic news content	useState (address), useMemo (CTA enable), useNavigation (navigate to AppointmentForm)	None directly, but supports service route entry	Section, PrimaryButton, NewsCarousel	keyboardShouldPersistTaps, removeClippedSubviews	Role tags, accessibilityLabel on buttons and sections
Service	Router hub for Recycle, Repair, Refurbish, Trade-in, Marketplace, Carrier services	React Navigation stack linking to each feature module	Routes connect to multiple contexts (RecycleContext, TradeInContext, etc.)	Section, IconButtons for each service	Preloads service screens for faster transition	Buttons use accessibilityLabel and icons use descriptive names
Marketplace	List, browse, and search second-hand electronics	useState, useRef, useMemo, navigation to detail with route.params	MarketplaceContext (listings, addListing, filters)	MarketplaceForm, SearchBarWithDropdown, FlatList, MarketplaceCard	FlatList for efficient rendering, useMemo for filtering logic	Form inputs labeled, interactive cards wrapped with labels
Marketplace -Detail	Shows selected product info with buy or remove actions	Receives listing via route.params	MarketplaceContext for removeListing (admin only)	Image, Price, Description, CategoryTag, PrimaryButton	useMemo for conditional CTA rendering	Descriptive button labels, image alt text equivalents
Carrier	User-to-carrier transformation + Pickup opportunities	useState (isSignedUp), useUserContext (hasRole), navigate to Dashboard	UserContext for role management	CarrierSignupForm, CarrierNearbyPickupCase, Section, PrimaryButton	Conditional rendering avoids re-loading signup form	Form fields and dashboard button have proper labels

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Carrier - Dashboard	Bottom tab view of carrier maps, earnings, and history	Tab Navigator, useUserContext to gate access	CarrierContext and WalletContext within subtabs	BottomTabs (Map, Wallet, History), Icons	UnmountOnBlur for better memory performance	Tab icons labeled and keyboard accessible
Request Services - (Recycle/Repair/Refurbish/Trade-in)	Unified form for scheduling pickup with user input and location	useContext (per service), navigation to ConfirmationScreen on submit	RecycleContext, RefurbishContext, RepairContext, TradeInContext	AppointmentForm, AddressInput, CalendarPicker, Upload	Shared form reduces component duplication	Input fields and upload buttons follow a11y standards
Settlement - (Confirmation, Feedback, Reward, Summary)	Post-service interaction flow including confirmation, review, reward, and summary	Props-driven; navigation between flow steps via buttons	None (read-only state, completion-based screens)	Section, PrimaryButton, Text, Icons	Lightweight components for fast transitions	Icons and buttons labeled, screen titles centered
Status	Track real-time progress of service with live map and timeline	Static status list, MapScreen receives props	None directly; could be extended	Timeline bullets, MapScreen, Section, PrimaryButton	Minimal renders, ScrollView performance	Label for support button and timeline events
Profile	Switch between roles and view personal wallet & history	useState (role), navigation to Wallet or OrderHistory	UserContext for dynamic role display	Section, RoleToggleButton, TextSummary	useMemo for rendering summaries based on role	Switch toggle has a11y roles and headings

Learnings

The Second-life app was created as a simulated UX and product development project aimed at tackling the pressing issue of electronic waste. Throughout this project, I applied an end-to-end UX process—from research and personas to wireframes, prototypes, usability testing, and front-end implementation—to simulate how a real-world e-waste management app could function.

This case study reflects my ability to integrate UX research, system thinking, and React Native development in a modular, scalable way. More importantly, it highlights how insights—even in a simulated context—can lead to better user-centered design decisions.

1. Key Achievements

- Unified Design System (ds.): Built a token-based design system ensuring consistent spacing, typography, colors, and UI patterns across 20+ screens and components.
- Modular Architecture Using Context API: Created separate contexts (RecycleContext, CarrierContext, MarketplaceContext, etc.) for clean logic separation and scalable state management.
- Responsive Multi-Role Navigation: Designed adaptive UI flows based on user roles (e.g., user vs. carrier), using React Navigation stacks, tabs, and role-aware screen switching.
- Research-Driven UI Decisions - Usability study (12 participants, 4 interface versions) revealed key insights:
 - Version B: High usability due to clear button-based UI.
 - Version E: Strong performance with intuitive location-first design.
 - Version E was selected for refinement, integrating the strengths of Version B.

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- e. **Accessibility-First Components:** Applied semantic labels, consistent structure, and focusable components to promote screen reader compatibility and clarity.
- f. **Component Reusability:** Reused form logic across AppointmentForm, MarketplaceForm, and CarrierSignupForm, reducing duplication and improving UX consistency.

2. Hypothetical Impact & Business Outcomes

Although this was a simulated project, each design decision was grounded in realistic user needs and product strategy. Based on usability testing insights and system design enhancements, the following outcomes are projected:

a. 30% Reduction in Scheduling Time

The Version E redesign streamlines the scheduling process by starting with address input and reducing unnecessary steps—leading to an estimated 30% decrease in task completion time for pickup requests.

b. 20% Increase in User Trust and Delivery Engagement

By implementing real-time carrier tracking and status updates, the platform is projected to build stronger trust with users, especially for sensitive services like Trade-In and Repair, encouraging more frequent engagement.

c. 15% Boost in Refurbished Product Conversions

Introducing transparent refurbishment descriptions, warranties, and user reviews is expected to increase conversion rates in the marketplace for refurbished items.

d. 25% Increase in Pickup Volume per Active User

With the addition of easy scheduling, incentive tracking, and educational content, the app may drive more repeat recycling behavior among environmentally conscious users.

e. 40% Faster Onboarding Completion for Carriers

A simplified, step-by-step registration and verification process for carriers aims to reduce drop-offs and expedite sign-up completions, helping scale delivery logistics efficiently.

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3. Next Steps:

Area	Recommendation	Description
Backend Integration	Connect Firebase/Supabase	Enable real-time syncing of profiles, pickup statuses, and listings.
Usability Testing 2.0	Focus on refined Version E	Validate role-switching logic, onboarding flow, and Carrier Dashboard.
Analytics & Funnel Tracking	Track user drop-offs	Use journey tracking to optimize conversion in trade-in, carrier sign-up, and checkout.
Security & Consent UX	Add encryption and data workflows	Especially important for trade-in and refurbish services involving personal devices.
Design System Expansion	Build Figma tokens + documentation	Prepare tablet and web rollout with consistent components.
Microcopy & Emotional Design	Refine tooltips, errors, empty states	Improve tone, clarity, and user trust through micro interactions.
Offline Support	Draft-saving & retry logic	Crucial for carriers in low-connectivity zones.

4. Final Thought

This project taught me how to balance technical scalability with human-centered design, even within a simulated setting. From stakeholder mapping to role-based architecture, every design decision was grounded in insights—even when those insights came from role-playing or peer feedback.

The Second-life app now stands as a robust concept for tackling e-waste—ready for future backend integration, pilot testing, and full deployment in real-world scenarios. Next, I aim to continue improving the interface based on refined Version E and run another usability test focused on multi-role interaction and real-time feedback mechanisms.