

PORTFOLIO

Wu Qihang · Designer | Projects from 2024.01 to 2024.12

SEE MY WORKS

01 Urban Agriculture

Product and Digital Platform
(Individual Project)



2024.05-2024.07

02 GoldenYears Sanctuary

Digital Platforms, Architecture, Product,
and Interactive Installations (Team Project)



2024.08-2024.11

03 Futuristic Diet

Architecture and Digital Platform
(Individual Project)



2024.11-2024.12

04 Phoenix

Product and Digital Platform
(Individual Project)



2024.01-2024.03

Urban Agriculture

This project focuses on service design to address challenges in urban agriculture by integrating **product and interface solutions**. It facilitates seamless collaboration between elderly and young gardeners through **interactive devices and systems**.

Using a user-centered approach, the project tackles issues such as **physical limitations, knowledge gaps, and social isolation**, providing intuitive interfaces and assistive tools for planting, care, and task management in urban green spaces.

Time: 2024.05–2024.07 Type: Individual Project

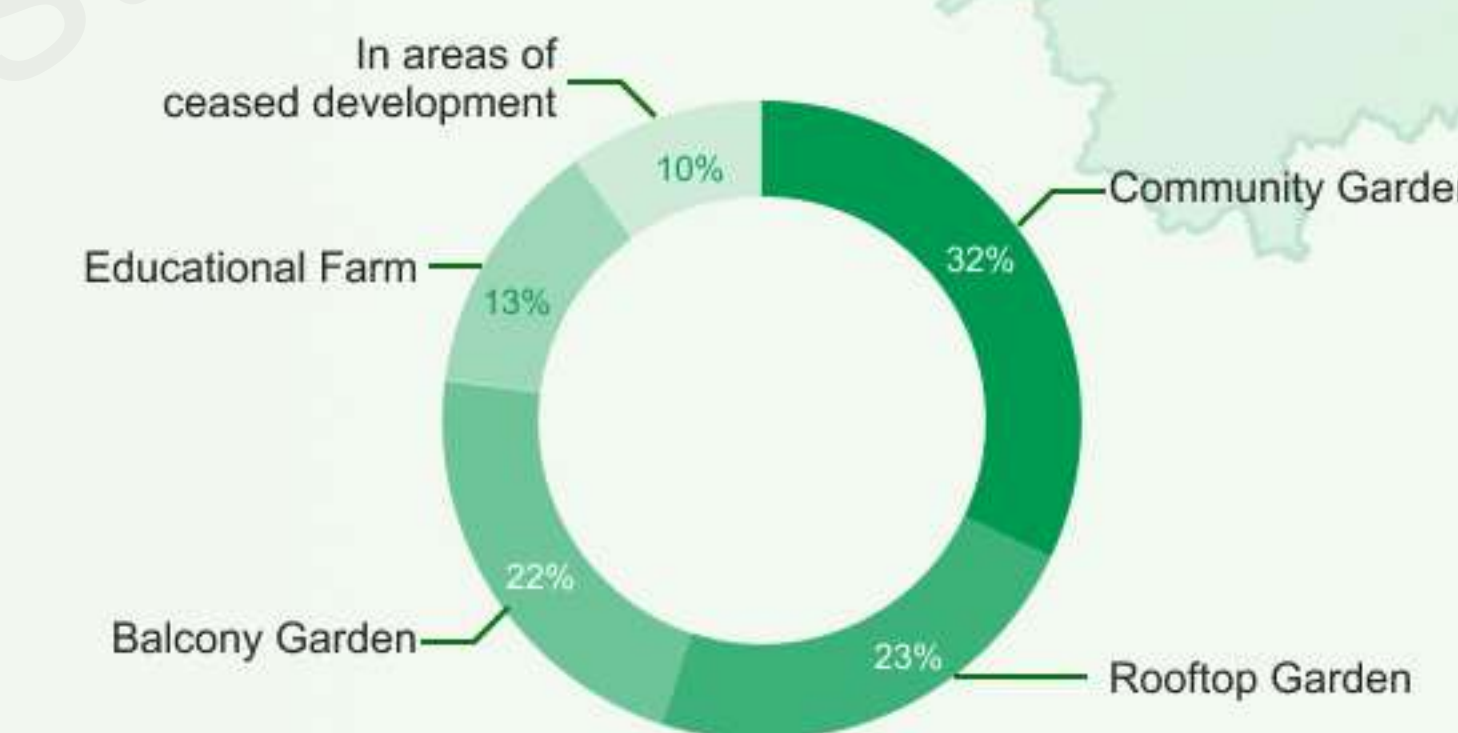
Desk Research

Definition Of Urban Agriculture

Urban agriculture refers to agricultural activities carried out **in or around cities**, including planting, breeding, and agricultural processing.

Urban agriculture in China is mainly concentrated in big cities such as **Beijing, Shanghai, Guangzhou, and Shenzhen**. The reason is that land resources in big cities are scarce, and urban residents have a **higher demand for green space and healthy food**.

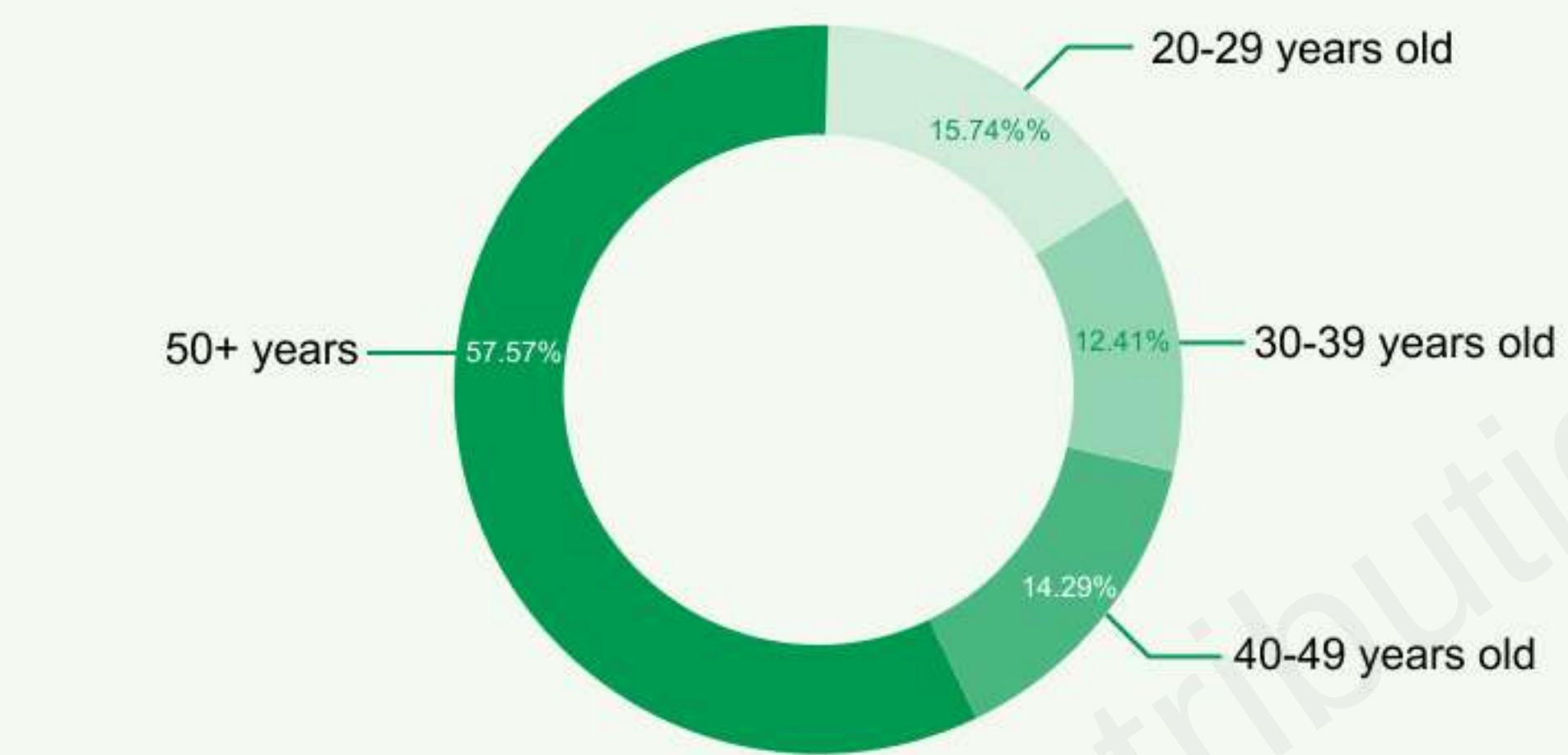
Types Of Urban Agriculture In China



Research Of Participants

Urban agriculture participants are generally **well-educated**, living in the city center, and from the upper middle class.

Age of Participants



Motivation



Challenges And Strategies

- Lack of urban land and resources
- Passive community engagement
- Limited government support

Challenges

- Consumption pattern
- Food waste
- National grain demand

Production

- Adopt community gardens, rooftop gardens, and vertical farms.
- Community participation
- Funding and resources support

Strategies

- Optimize resident dietary pattern
- Reduce food waste
- Adjust grain demand structure
- Moderate food imports policy

Consumption

Urban agriculture in Chinese cities includes **community gardens, rooftop gardens, balcony gardens, and educational farms**. Participants are typically **urban retirees, white-collar workers, and families**. Available space and supportive policies facilitate this practice, promoting sustainable urban living.

Stakeholder Map

Description Of Reason

By systematically identifying and analyzing stakeholders, urban agriculture projects can be designed to be more effective, inclusive, and sustainable, addressing the diverse needs and leveraging the strengths of all involved parties.



Key Stakeholder List



Relationships

- Support grower and enjoy the benefits of the harvest
- Directly interacts with residents, manages and supports them
- Ensures urban farming activities comply with community regulations
- Formulate and implement relevant policies, provide resource support
- Develop relevant policies and provide guidelines
- Offer scientific research and technical guidance
- Provide planting resources and technical support
- Purchase and consume products from urban farming

Interview

Urban Planter Interview



Q: How do you plan your planting space before starting planting?

A: The flowers struggled on the balcony due to poor lighting, so vegetables were planted on the rooftop instead, with support from residents and the landlord.

Q: Do you think the nutrients needed to grow crops are sufficient?

A: Choose organic fertilizer, applying once or twice a week based on plant growth. Reduce if yellowing, increase if thriving. I will not choose homemade fertilizer because it is troublesome.



Q: How do you choose plants or seeds suitable for an urban environment?

A: I buy from the flower market; they generally offer plants that are well-suited for cultivation.

Q: Is your planting area easy to water?

A: Yes, it's easy. I use an automatic irrigation system. If the water supply is insufficient, I adjust the system. The automatic irrigation is convenient, though occasionally the batteries run out.

Q: Do you believe the nutrients for your crops are sufficient?

A: To ensure better plant growth, I buy fertilizer and use it every 10-15 days. I've experienced both nutrient deficiencies and over-fertilization.

Government Research Interview

"Major Chinese cities like Beijing, Shanghai, Guangzhou, and Shenzhen actively promote urban farming through supportive policies, integrating green spaces and innovative practices to enhance community welfare in urban areas."

Food Safety

Residents must use qualified seeds, soil, and adhere to planting standards for food safety.

Public Hygiene

Watering, fertilizing, and spraying must not impact neighbors' hygiene. Trim hanging plants regularly.

Planting Areas

The committee issues licenses and designates planting areas for approved residents.

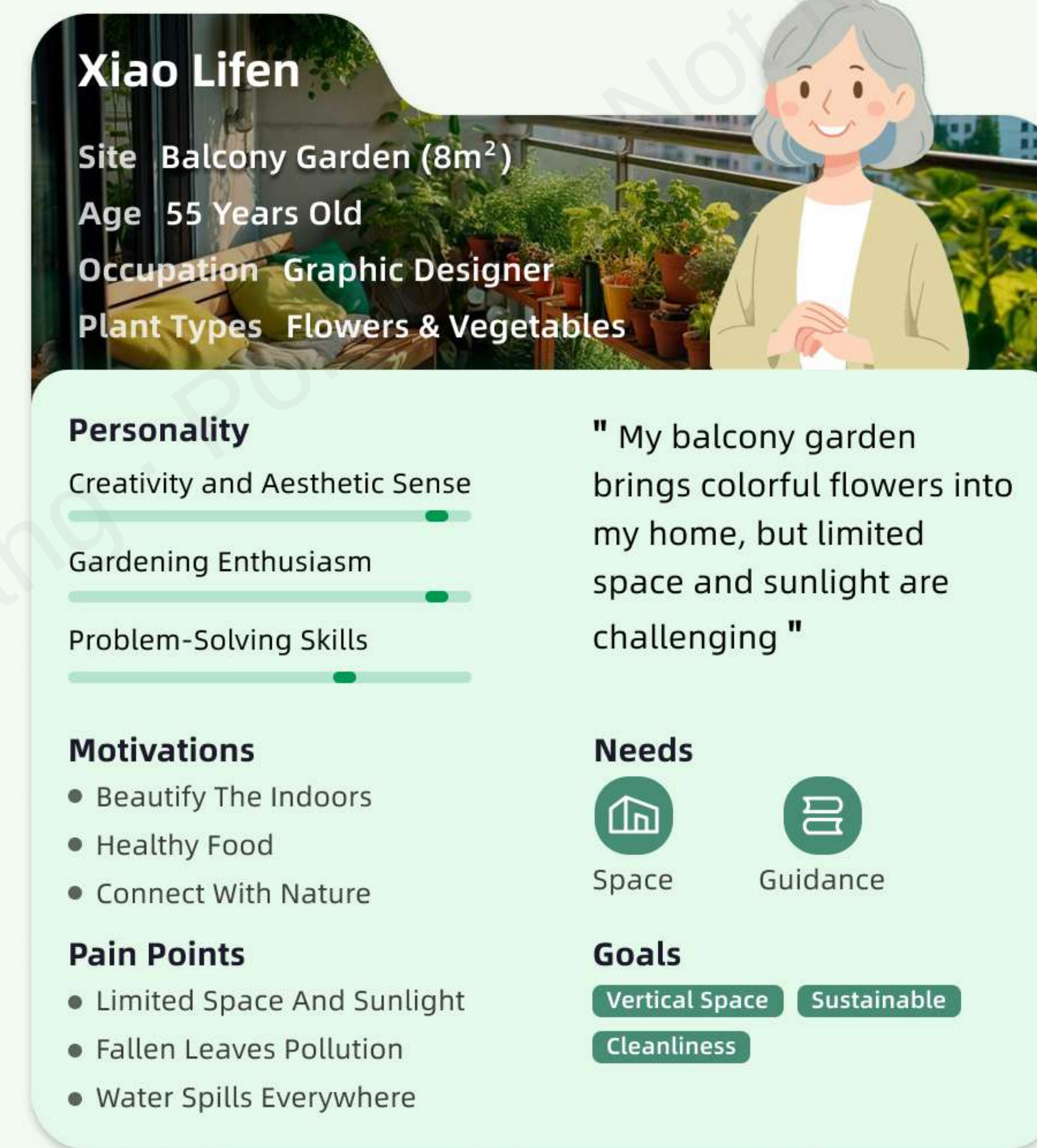
Vegetable Varieties

Residents' vegetable varieties must comply with laws, regulations, and environmental protection standards.

Public Safety

Ensure safety with secure flower pots and racks; avoid installing them on high-rise buildings.

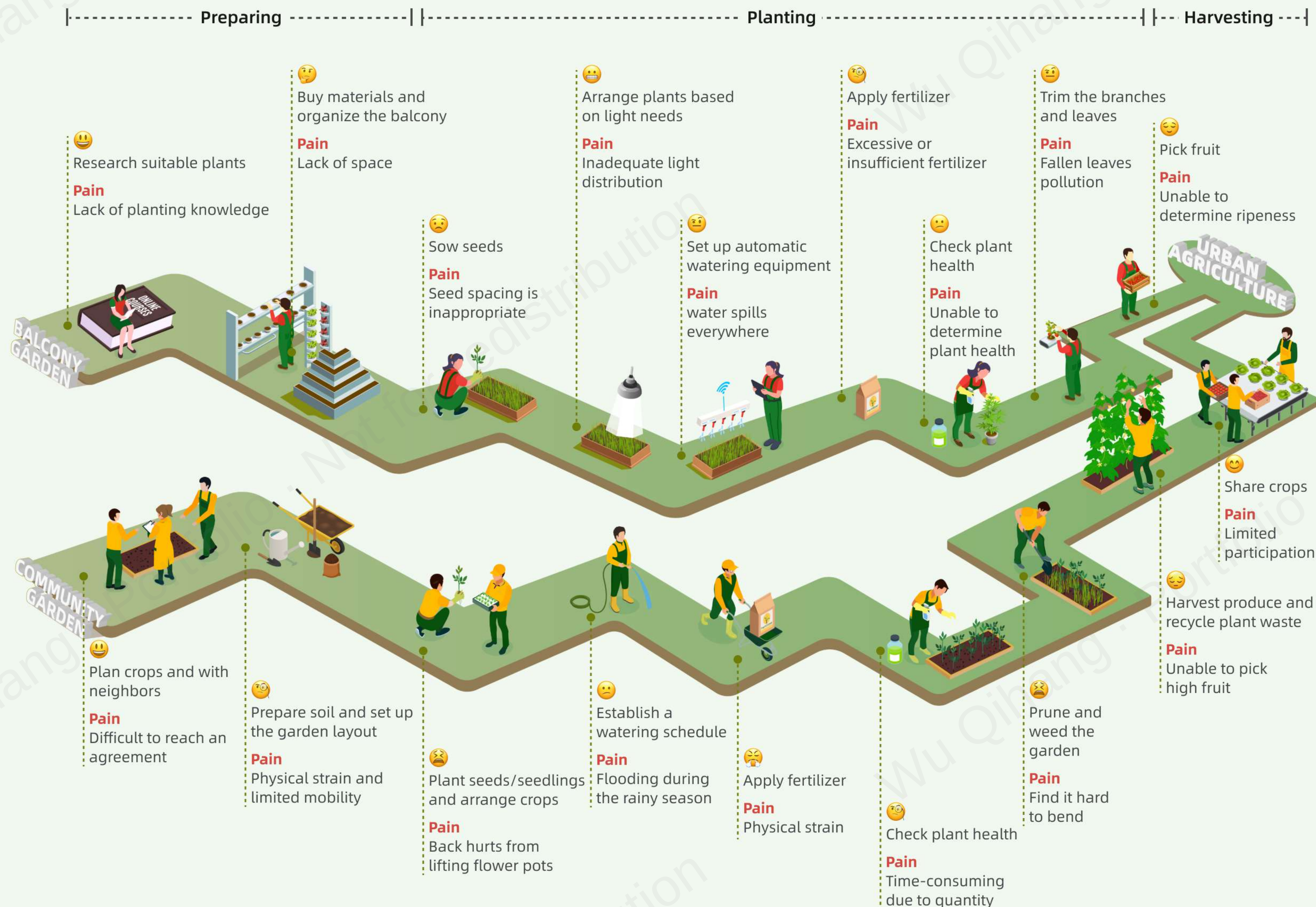
Persona





Process Map

This image compares balcony and community gardening across "Preparation," "Planting," and "Harvesting," highlighting planting challenges at each stage



Problems And Insights

Problem Tree

Seniors find it hard to bend

Back hurts from lifting flower pots

Physical Adaptation

Seniors unable to pick high fruit

Can't carry heavy water jug

Limited opportunities for knowledge sharing

Feel lonely gardening alone

Social Isolation

Hard to find local gardening communities

Privacy concerns when sharing garden photos online

Cold weather kills new plants

Too much water, roots turn black

Not enough sun, plants turn yellow

Knowledge & Skills

Too much fertilizer burns leaves

Small bugs eat rose leaves

Rain drowns small herbs

Sad when flowers won't bloom

Insufficient recognition for gardening efforts

Achievement & Motivation

Lack of benchmarks for gardening progress

Dirt falls on living room floor

Insights

Knowledge & Skills
Provide personalized assistance to seniors with varying skill levels.

Physical Adaptation
Facilitate peer support through gardening community social activities.

Social Networking
Create a social network for gardening enthusiasts to share and discuss.

Achievement & Motivation
Enhance users' sense of achievement in their gardening endeavors.



Case Study

Nutri AI Kitchen Scale

Smart nutrition tracker that automatically records detailed food intake. It identifies and logs nutrition facts of foods, eliminating manual data entry.

Key points

Automated Identification Nutritional Analysis Data Logging



Dibble

It is a garden tool with interactive features. When inserted and rotated, it sends help requests to volunteers. Volunteers respond similarly, earning points for market vegetables.

Key points

Task Request System Reward Mechanism

Betty

Tangible interface device with three points. Place a contact on a point to send them a message, simplifying communication for users.

Key points

Tangible Interface Personalized Messaging



Pet Communication Button

The pet communication button recorded the corresponding language. After training, the dog can use the button correctly to communicate with people, and even learn more than 29 words.

Key points

Multi-Modal Interaction Customizable Command Set

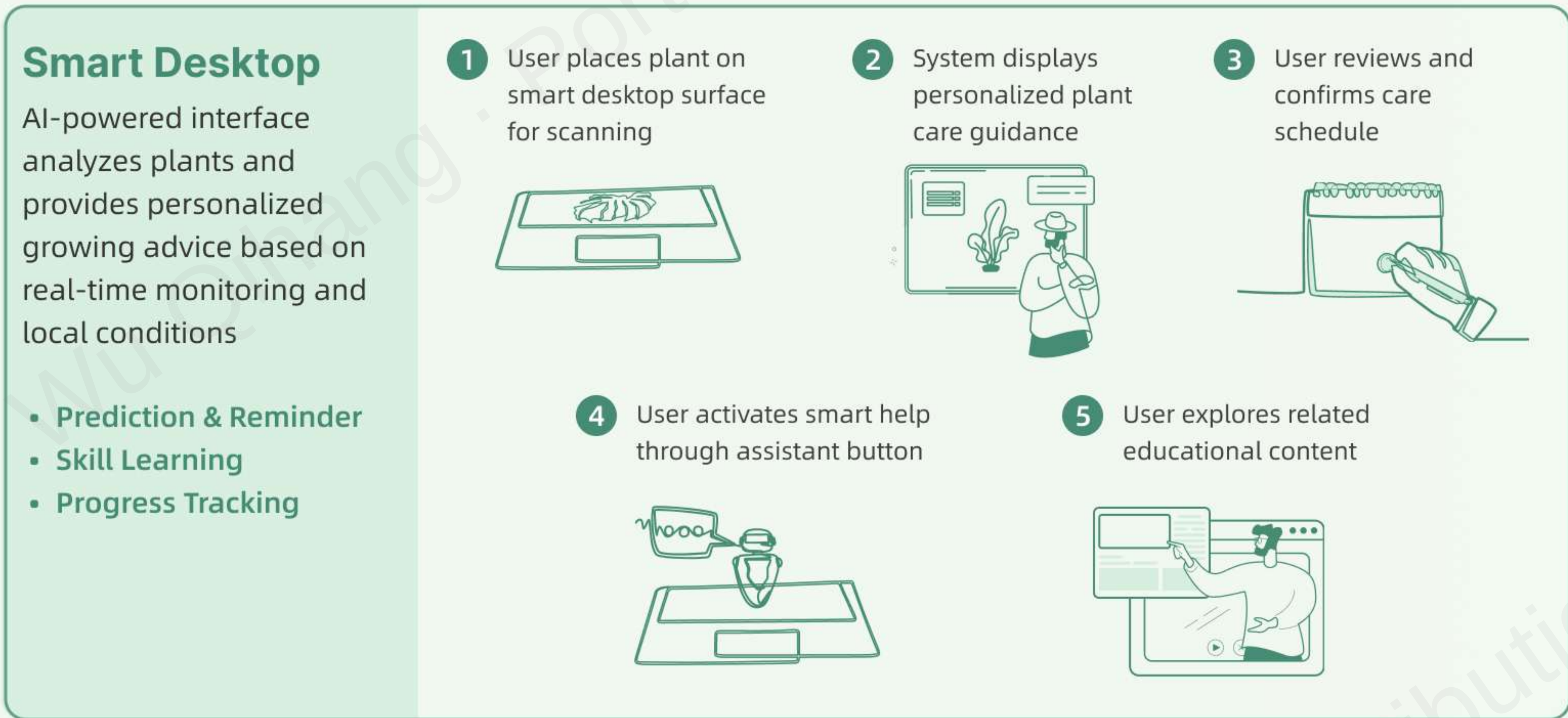
Ideation



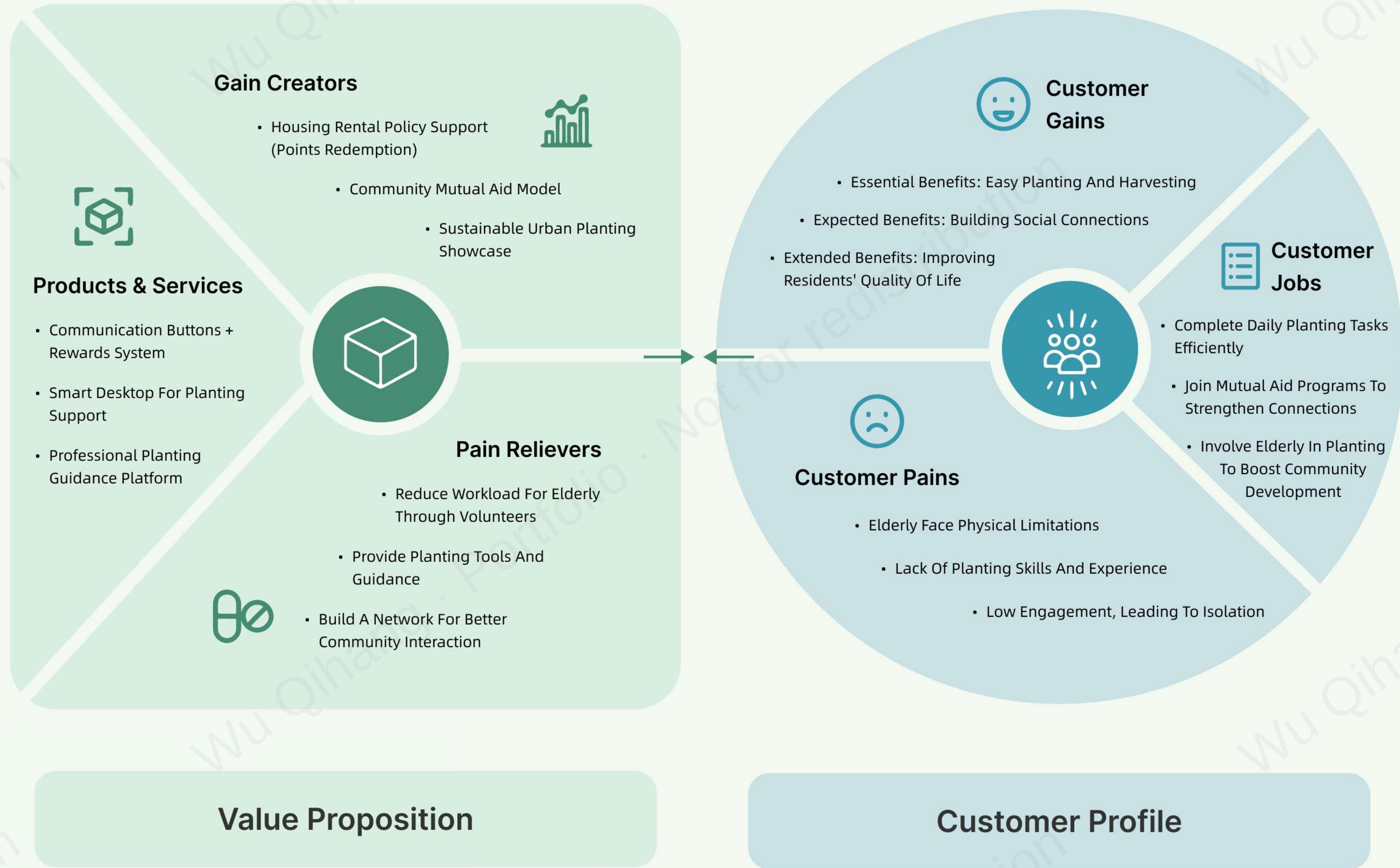
Concept 1



Concept 2



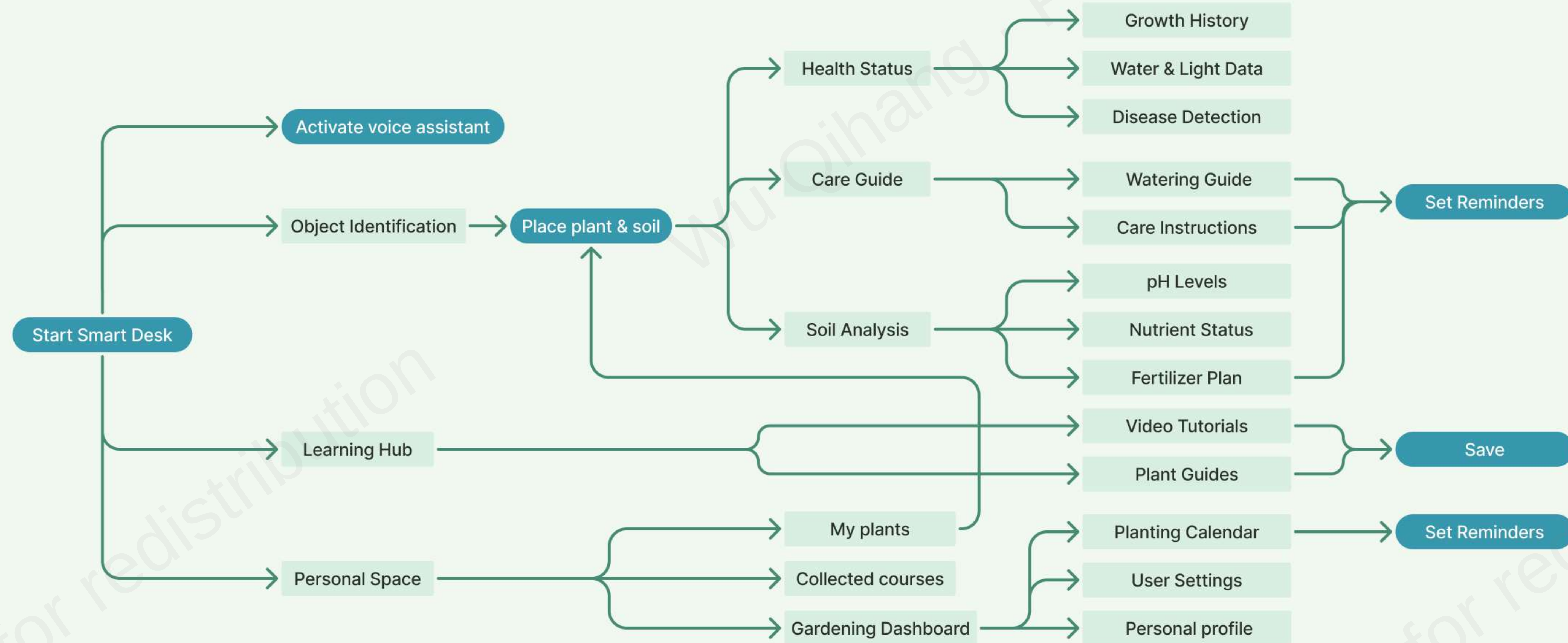
The Value Proposition Canvas



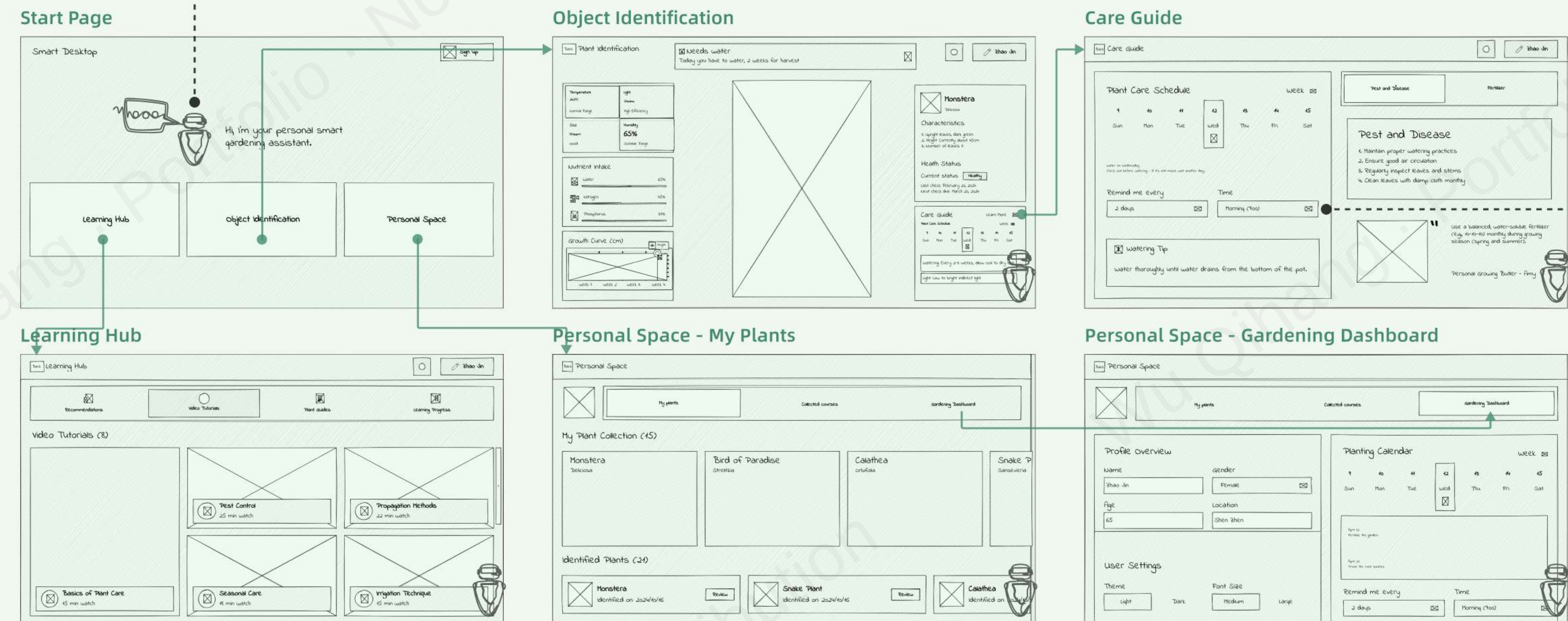
Smart Desktop

Due to the primary user group being elderly, the interaction design employs **fewer hierarchical levels**, instead displaying information directly categorized by type to meet user needs

As elderly users in Chinese regions often **feel overwhelmed** when using digital technology products, and considering the **health concerns** of prolonged screen time, we've retained only essential core functions. Social features have been intentionally omitted from this product, instead **encouraging real-world social interactions** through alternative approaches



The start page prominently features a voice assistant functionality to cater to users' personalized needs



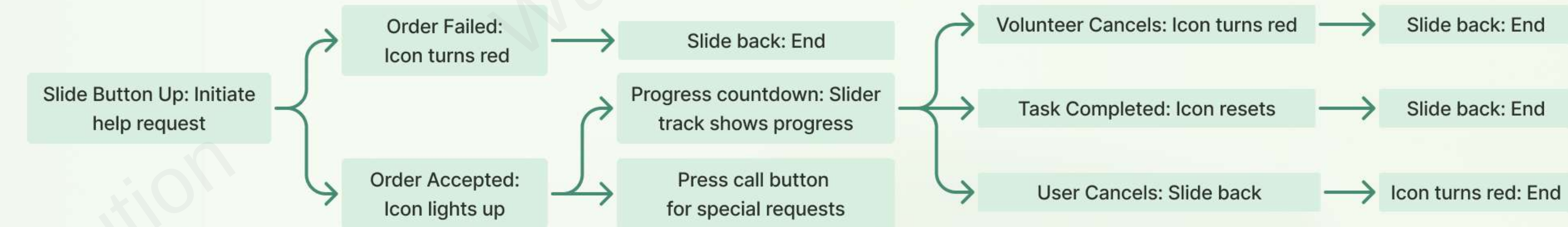
- Detailed care guides can be accessed through the 'More' button on the plant status page, and users can adjust their management settings

Additionally, voice assistant buttons are placed on the periphery of each page to allow users to activate the feature at any time

In the Personal Space section, users can switch between different tabs to view different module information or adjust settings

Communication Button System

Physical Button Set The Physical Button Set is designed for elderly growers without mobile access, offering intuitive interaction through customizable AssistSliders for various assistance requests such as **transporting, picking, pruning, or carrying**. It also includes a **call button, a speaker and mic**, and a **charging pad** for seamless interaction. The system integrates with a **volunteer app**, enabling volunteers to **receive and respond** to help requests effectively.



AssistSlider Modules



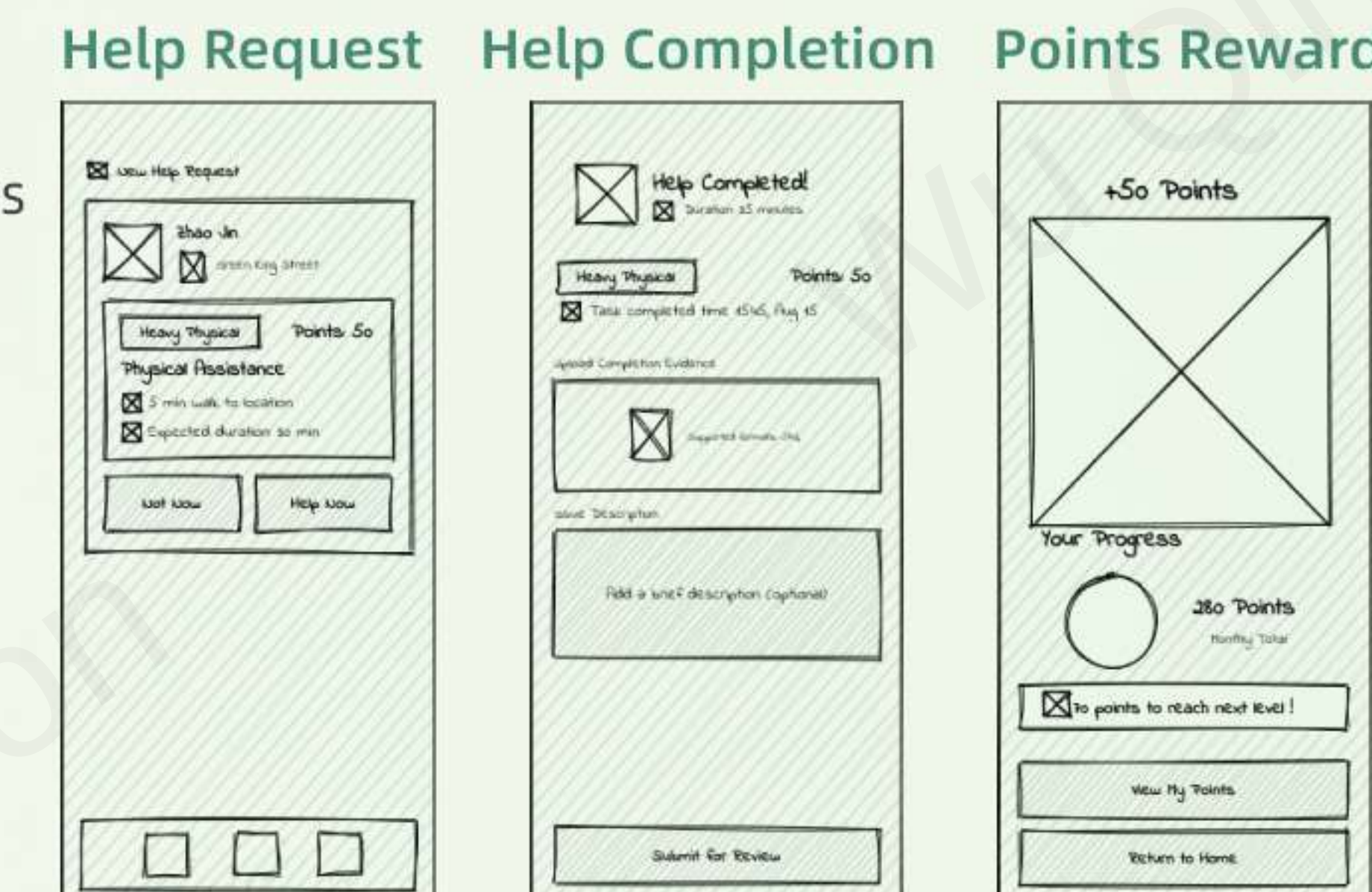
Product Views From Different Angles



Volunteer Mobile App

The Communication Button system notifies volunteers of assistance requests through an intuitive mobile interface. Volunteers can:

- **View Request Details:** Access task information, including the type of assistance, location, and requester profile
- **Earn Points:** Complete tasks to gain points, track achievements, and level up in the system



Scenarios And High-Fidelity

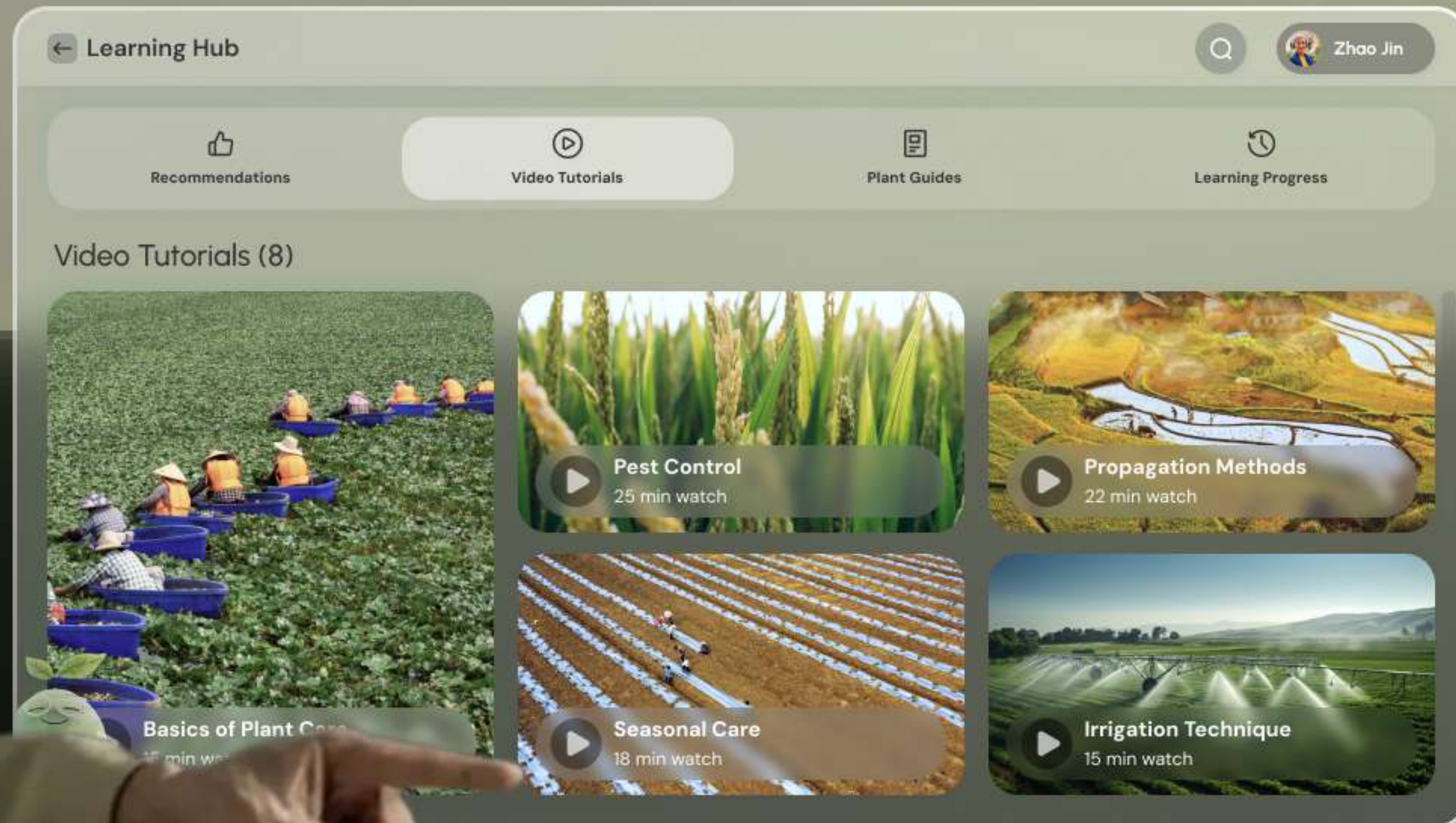
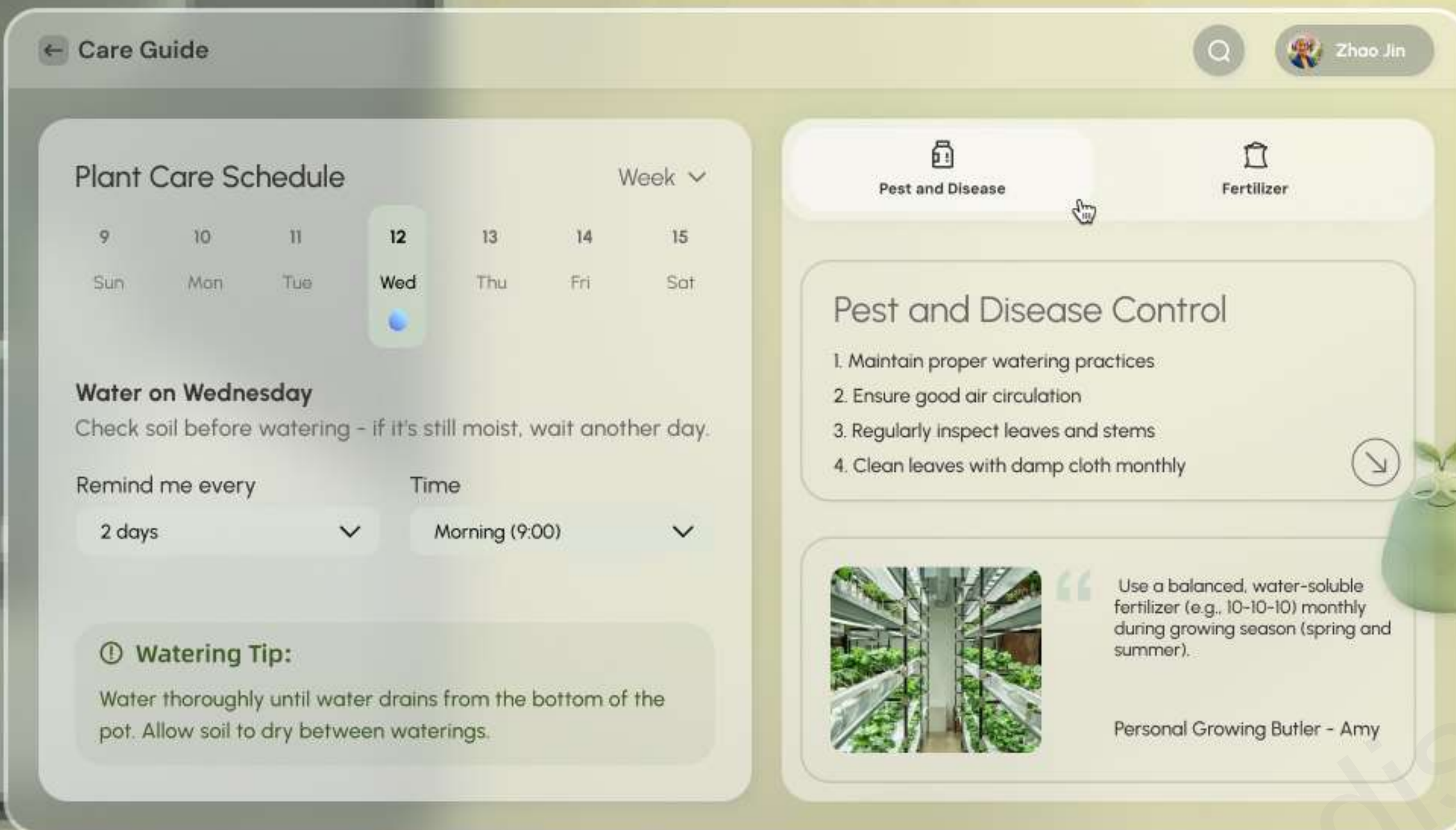
Smart Desktop

The Smart Desktop, powered by **Sony Xperia Touch**, transforms any surface into an interactive gardening assistant. Designed for urban gardening enthusiasts, it provides real-time plant care guidance, pest control tips, and progress tracking through an intuitive projection interface.



Intelligent Assistant : GrowMate

This intelligent assistant combines nature and wisdom, with a soft green body and leaf sprout reflecting plants and glasses symbolizing knowledge



Design For Future

Urban Planning Integration

Integrating productive **foodscapes** into urban design to create sustainable city landscapes

Intergenerational Education

Connecting **schools and communities** through collaborative agricultural learning programs

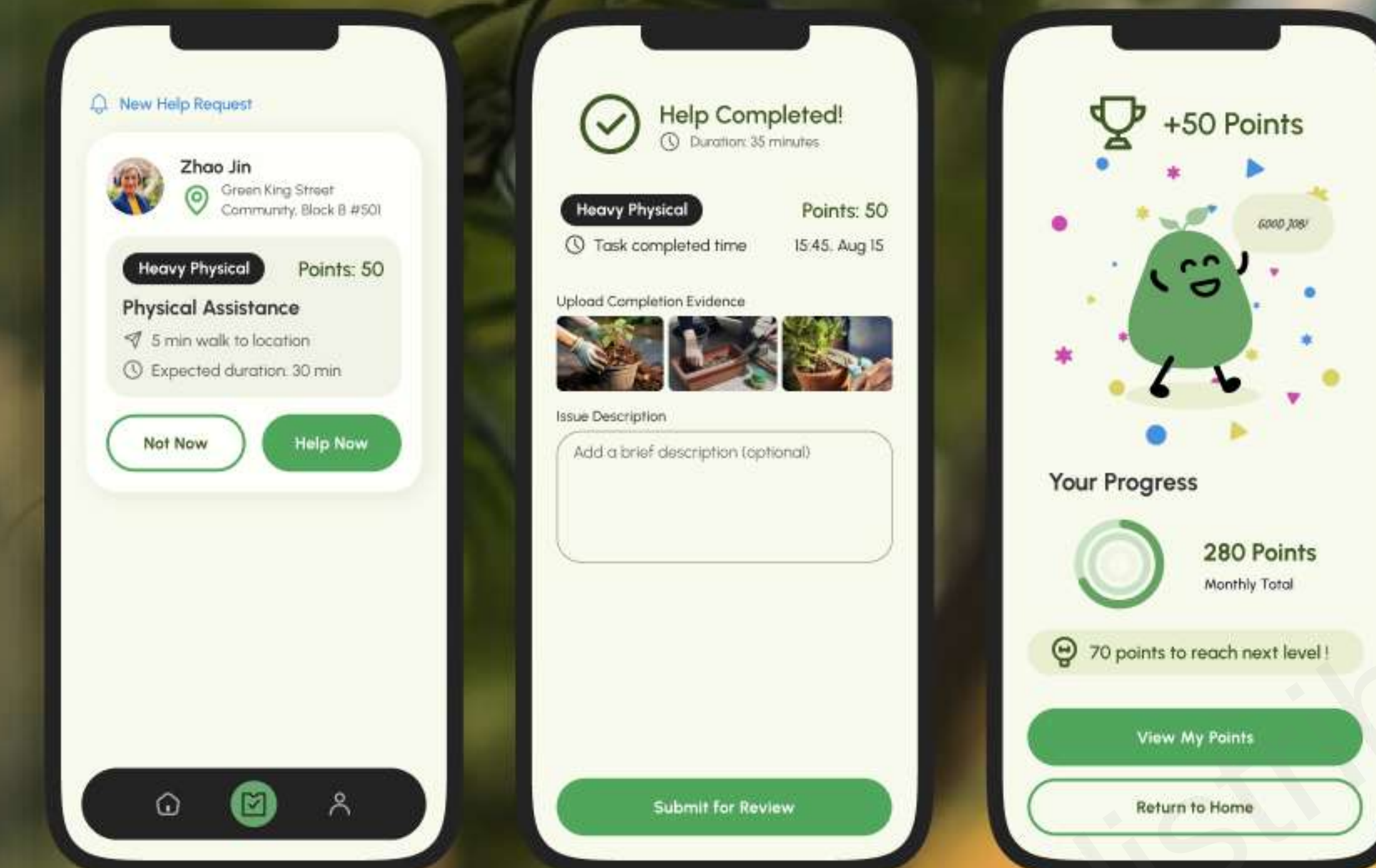
Spatial Planning Innovation

Designing **barrier-free gardens** that combine elderly care spaces with community agriculture

Social Inclusivity

Creating **age-inclusive** participation models for shared urban farming experiences

Volunteer App Interfaces



Nature-Inspired Theme

- Soft green accents throughout the interface reflect a connection to gardening and sustainability.
- The warm, earthy tones evoke a sense of calm and approachability

GoldenYears Sanctuary

Our "GoldenYears Sanctuary" is a comprehensive service design project aimed at revolutionizing **the way we perceive and care for aging animals** in zoological settings.

This multifaceted approach combines digital platforms, architectural design, product design, and interactive installations to raise public awareness and improve the quality of life for elderly animals.

Time: 2024.08-2024.11 Type: Team Project Role: Leader

Contribution To Key Components:

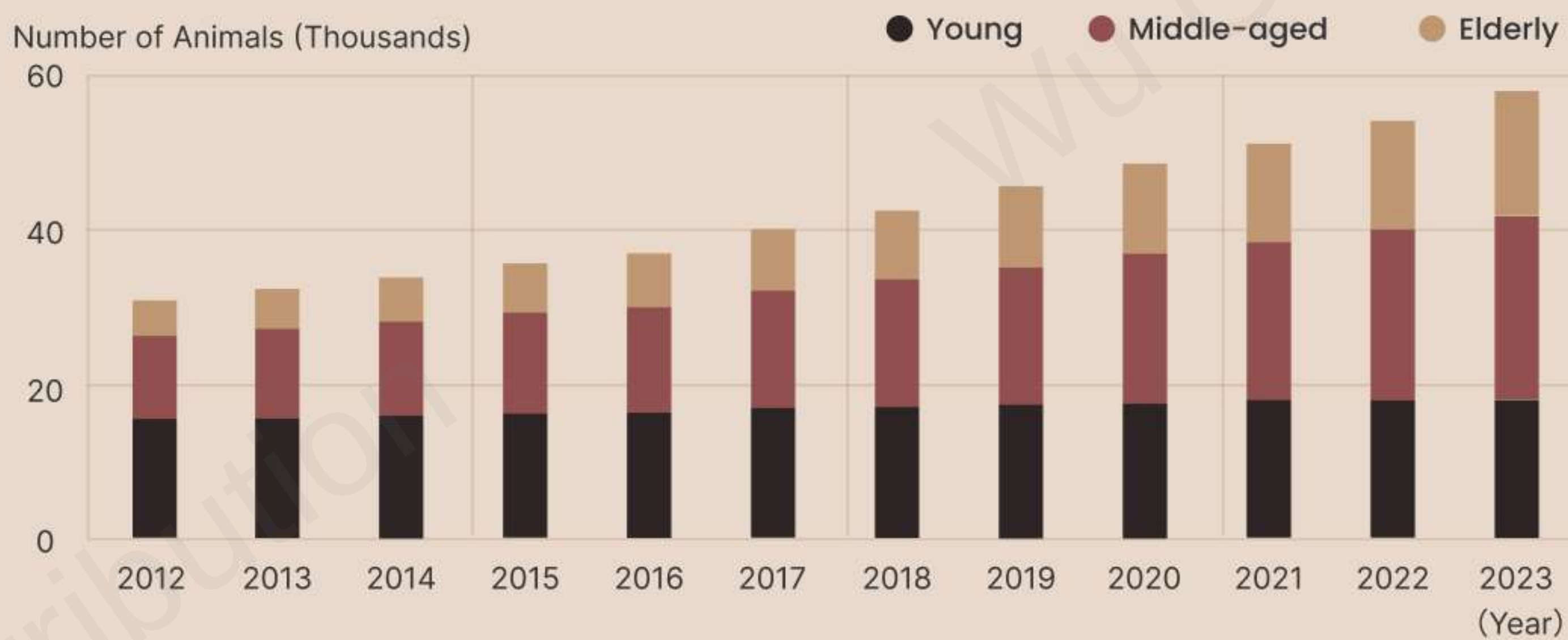
Digital Platforms (90%) , Interactive Installations (30%)

Architectural Design (20%) , Product Design (10%)

1 Background

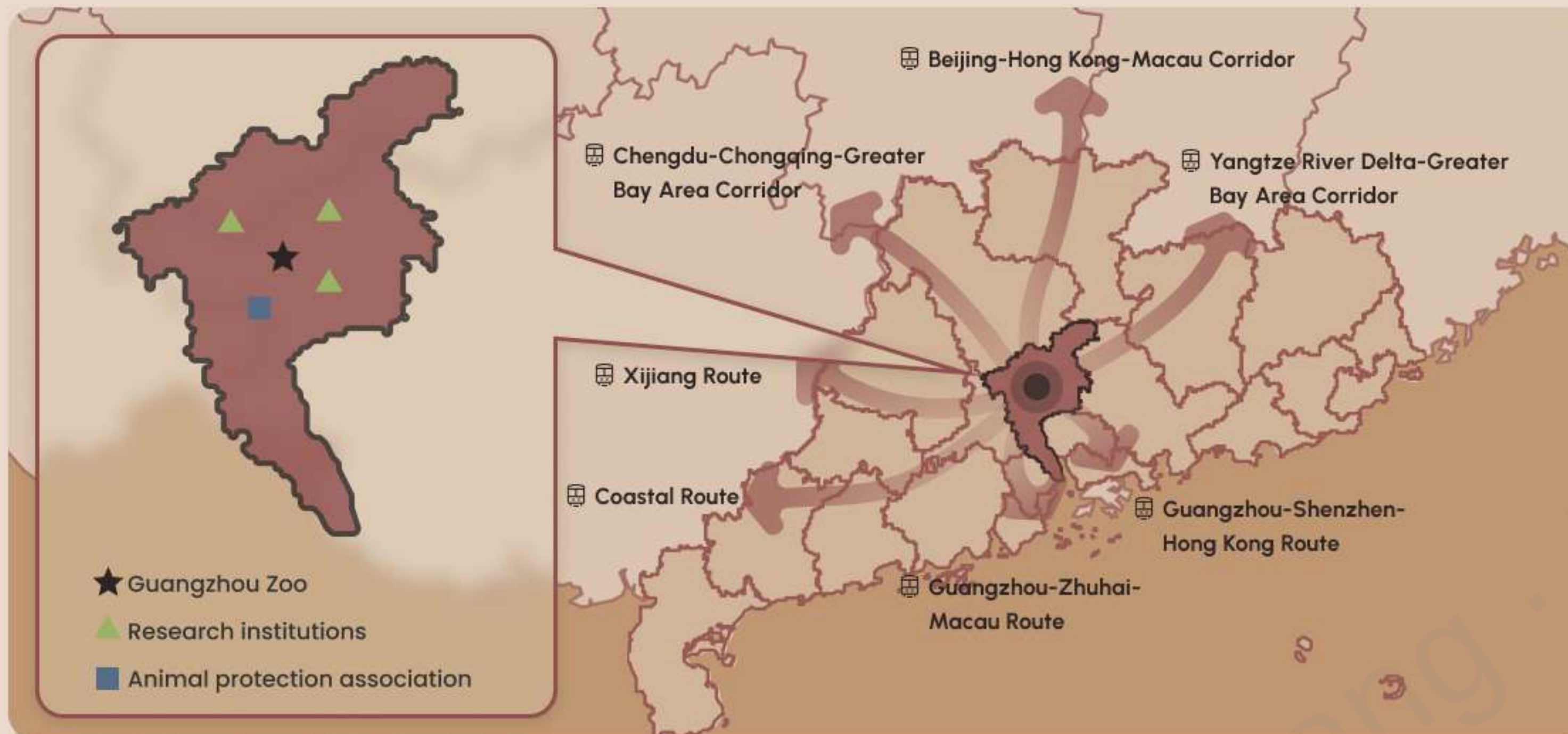
Aging Trend of Zoo Animal Population in Guangdong Province (2012-2023)

Showing increase in total numbers and growing proportion of elderly animals



Site Selection Of Zoo

Guangzhou Zoo, established in 1958 in Yuexiu District, houses 4,500 animals across 450 species, including 67 nationally protected species, and attracts 4 million visitors annually. With these characteristics, it serves as a suitable location for our design.



The reason for choosing Guangzhou zoo

Long history
Established zoo with decades of experience in animal care.

Convenient transportation
Well-connected location facilitating easy access for visitors and resources.

Large elderly animal population
Significant expertise in caring for aging zoo animals.

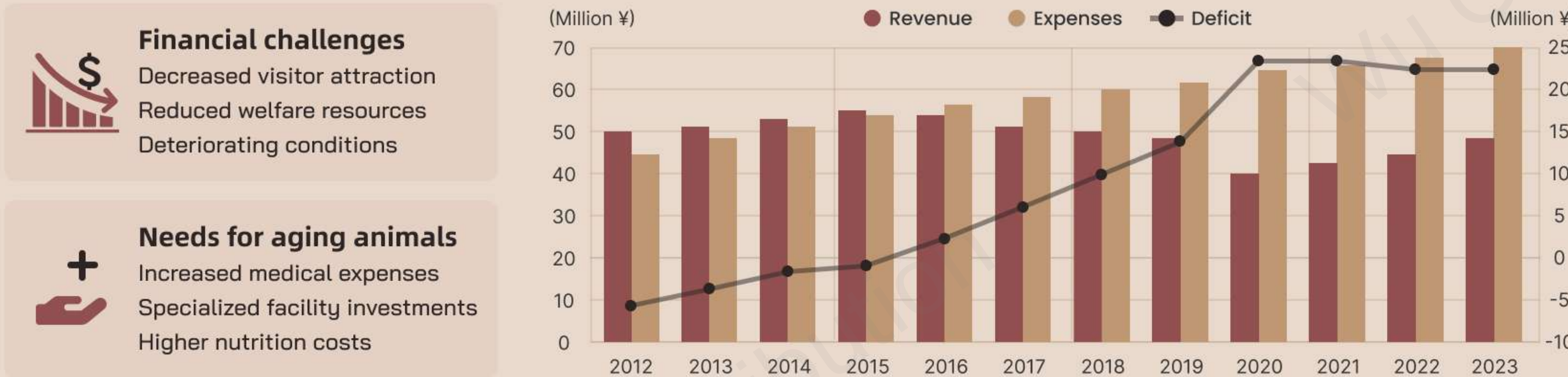
Animal protection association
Center for coordinating regional animal welfare and conservation efforts

Subtropical climate
Ideal weather conditions for diverse animal species year-round

Nearby research institutions
Collaboration opportunities with universities for animal behavior and conservation studies

Economic Pressures on Smaller Zoos in Guangdong Province (2012-2023)

Illustrating revenue decline, rising expenses, and growing deficit in smaller zoos



Animal Analysis

Our project focuses on Brown Bears, Stub-nosed Monkeys, South China Tigers, Asiatic Lions as primary research subjects. We selected these species due to their high proportion of aging individuals. Additionally, these animals are Long-lived in captivity, presenting unique care challenges.

Brown Bear
Height 100~150cm
Width 90~150cm
Length 170~280cm
Weight 180~280kg

Lighting Requirements
Total Darkness | Dim Light | Low Light | Moderate Light | Bright Light | Intense Light

Sound Requirement
Very Low Noise | Low Noise | Moderate Noise | High Noise | Very High Noise | Extreme Noise

Main distribution areas
Brown Bear: Found in southwest regions of China

Types of food.
60.0% 20.0% 15.0% 5.0%

Stub-nosed Monkey
Height 57-76 cm
Width 25-55 cm
Length 50-135 cm
Weight 15-20 kg

Lighting Requirements
Total Darkness | Dim Light | Low Light | Moderate Light | Bright Light | Intense Light

Sound Requirement
Very Low Noise | Low Noise | Moderate Noise | High Noise | Very High Noise | Extreme Noise

Main distribution areas
Stub-nosed Monkey: Primarily found in southwestern mountains of China

Types of food.
60.0% 20.0% 15.0% 5.0%

South China Tiger
Height 70-80 cm
Width 50-70 cm
Length 2.2-2.6 m
Weight 130-175 kg

Lighting Requirements
Total Darkness | Dim Light | Low Light | Moderate Light | Bright Light | Intense Light

Sound Requirement
Very Low Noise | Low Noise | Moderate Noise | High Noise | Very High Noise | Extreme Noise

Main distribution areas
South China Tiger: Endemic to south China

Types of food
72.0% 10.0% 10.0% 8.0%

Asiatic Lion
Height 80-120 cm
Width 70-120 cm
Length 2.2-2.7 m
Weight 120-190 kg

Lighting Requirements
Total Darkness | Dim Light | Low Light | Moderate Light | Bright Light | Intense Light

Sound Requirement
Very Low Noise | Low Noise | Moderate Noise | High Noise | Very High Noise | Extreme Noise

Main distribution areas
Asiatic Lion: Distributed across parts of Asia (mainly shown in India region on the map)

Types of food
72.0% 10.0% 10.0% 8.0%

2 Field Research

The research combined interviews and observations, focusing on elderly animal care, health management, and public engagement. Key findings highlighted issues with **manual health monitoring**, **weak emergency alerts**, and **low visitor engagement**.

On-Site Observations



- Poor enclosure design increases risks of **unsafe feeding** by visitors.
- Limited space **restricts natural behaviors** and causes stress.
- Inadequate enrichment** fails to stimulate physical and mental activity.



- Resting areas **lack comfort and proper temperature** regulation.
- Existing facilities do not support the physical needs of elderly animals.
- Limited medical resources** affect preventive care and treatment.



- Inadequate care** for aging animals.
- Hidden care areas, **visitors unaware** of behind-the-scenes work



- Insufficient staff** for personalized care.
- Habitats lack natural, engaging features.
- Enclosures fail to **ensure safety and comfort**.

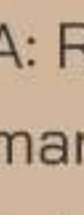


- Outdated exhibits** fail to engage visitors.
- Lack of stimulation reduces activity.
- Minimal education** on elderly animal care.

Staff Interview



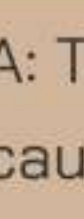
Q: In the daily care of elderly animals, which tasks are the most time-consuming?



A: Recording and **monitoring health data** manually is very time-consuming. This method is not only **inefficient** but can also lead to errors



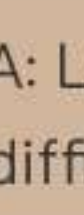
Q: What challenges do you face in health management?



A: There was an incident where delayed alerts caused a missed treatment for an elderly animal experiencing a sudden health issue at night



Q: What is the biggest drawback of current promotional methods?



A: Lack of interactivity and appeal makes it difficult to effectively convey the needs of elderly animals, leading to **low visitor engagement**

3 Questionnaire



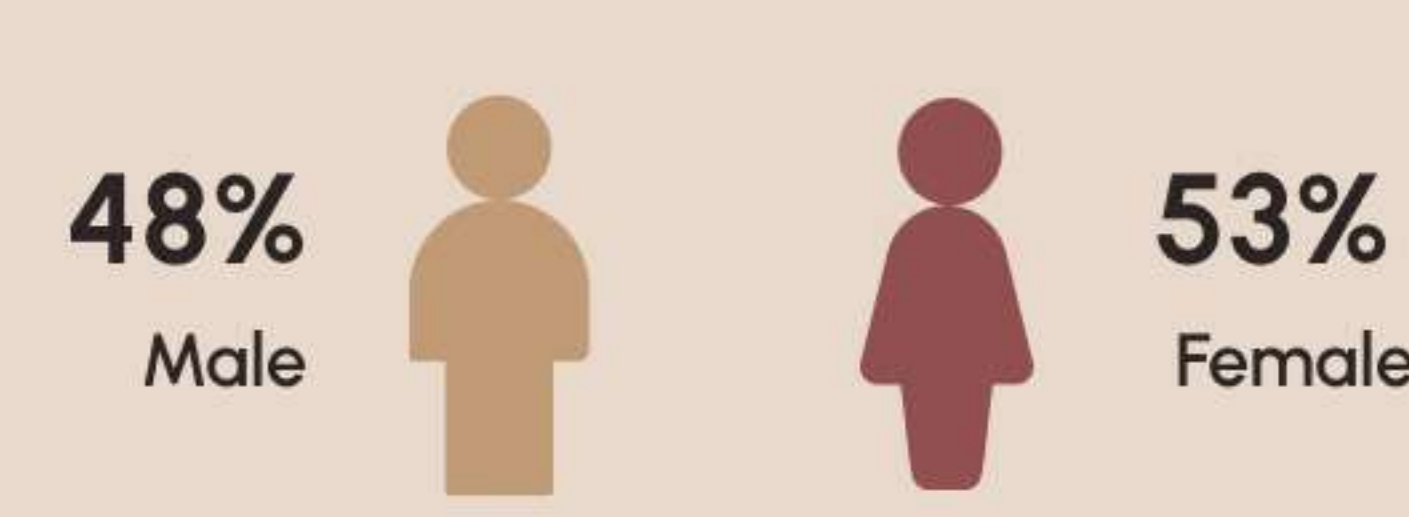
We conducted a visitor survey to understand public awareness and engagement with elderly zoo animals. The questionnaire focused on **visitor demographics**, **visit motivations**, **learning preferences**, and **suggestions for facility improvements**.

Basic Information

Age



Gender



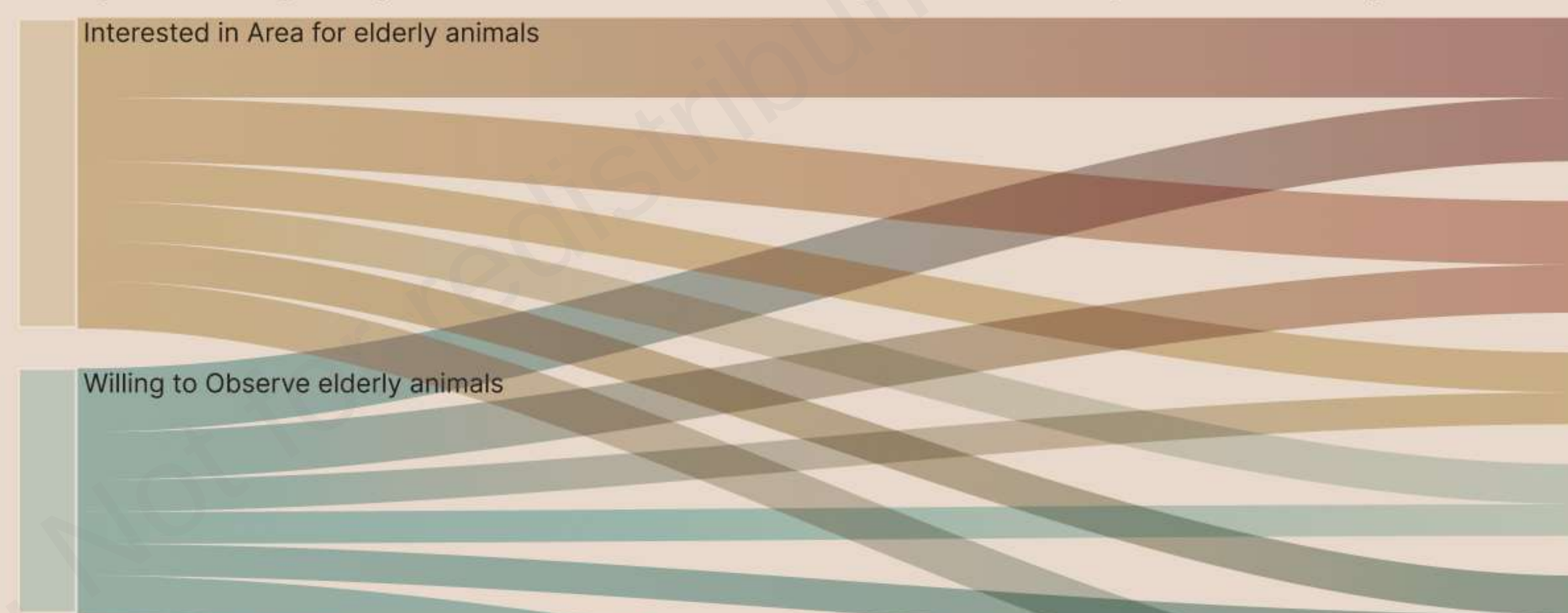
Are you aware that there are elderly animals in the zoo?



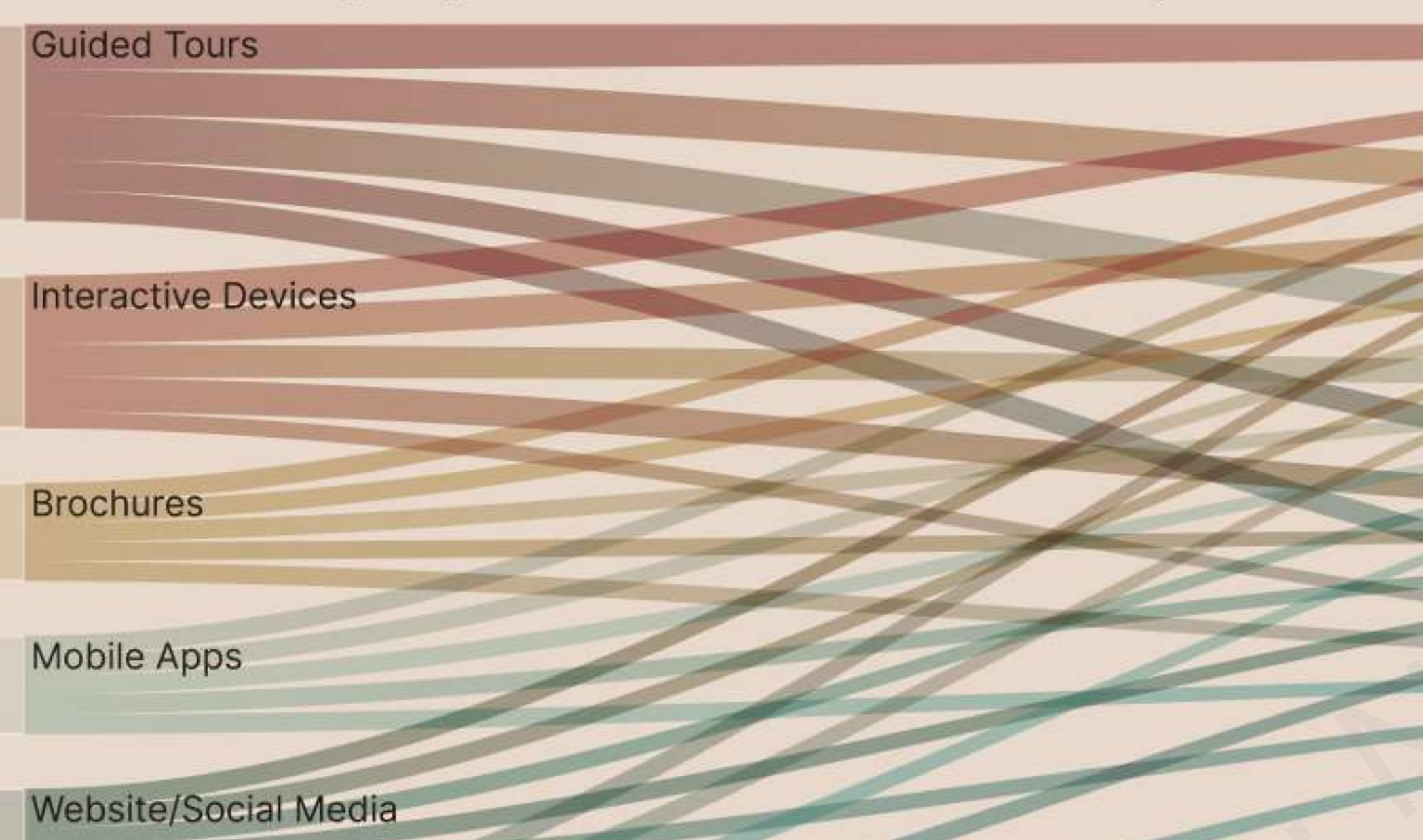
Zoo Visit Purpose?



Are you willing to spend more time observing and learning about elderly animals?



How would you prefer to learn about elderly animals?



What special facilities do you think the zoo should provide?



Site Selection For The Elderly Animal Care Center

Summary: Choosing the Amusement Park

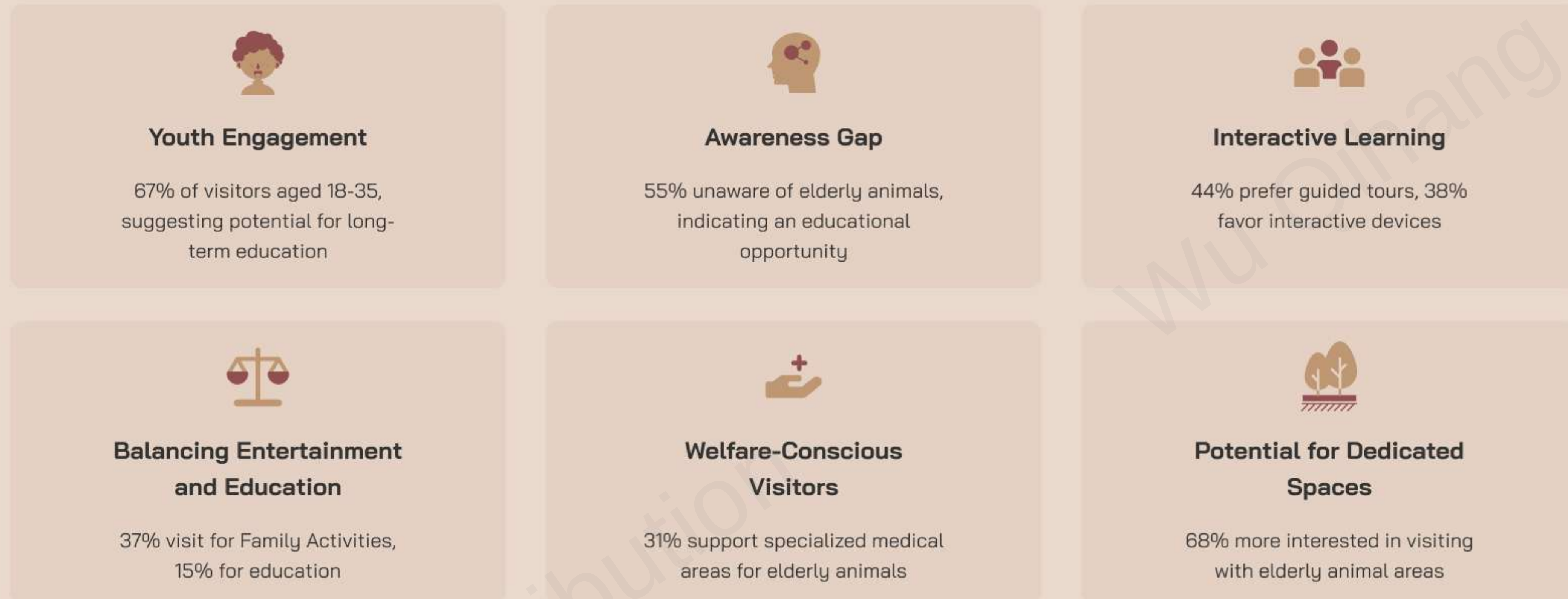
The amusement park stands out as the ideal site due to its spacious layout and existing infrastructure, reducing redevelopment costs compared to other areas.

Unlike the science corridor or animal performance zones, its large, adaptable space allows for the creation of customized habitats that cater specifically to the needs of elderly animals.

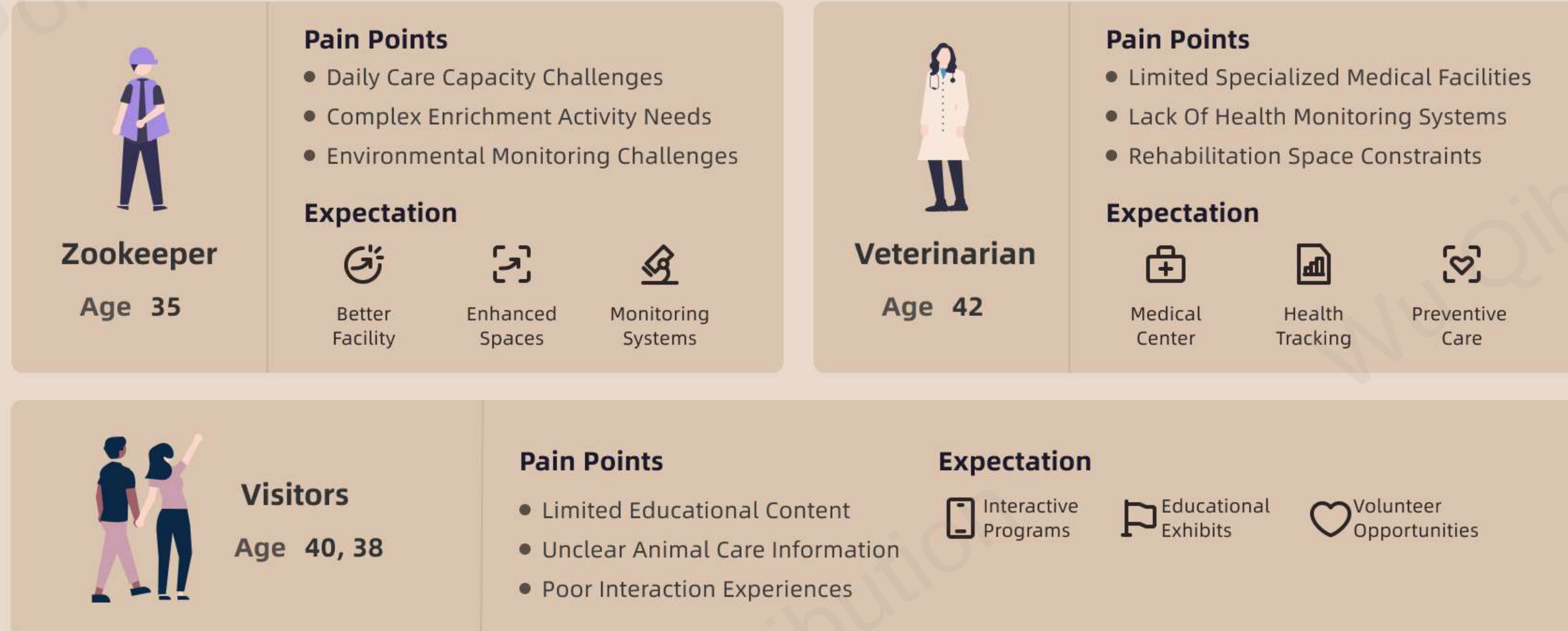


- Amusement Part**
 - Closed due to age and disrepair
 - Inconsistent with modern zoo concepts
 - Occupies valuable space for potential animal habitats
- Animals Performance**
 - Ethical concerns about animal shows
 - Limited educational value
 - Outdated presentation methods
- Science Corridor**
 - Outdated exhibits and information
 - Worn-out interactive installations
 - Narrow, elongated layout with limited space

What Can We Get From The Questionnaire?

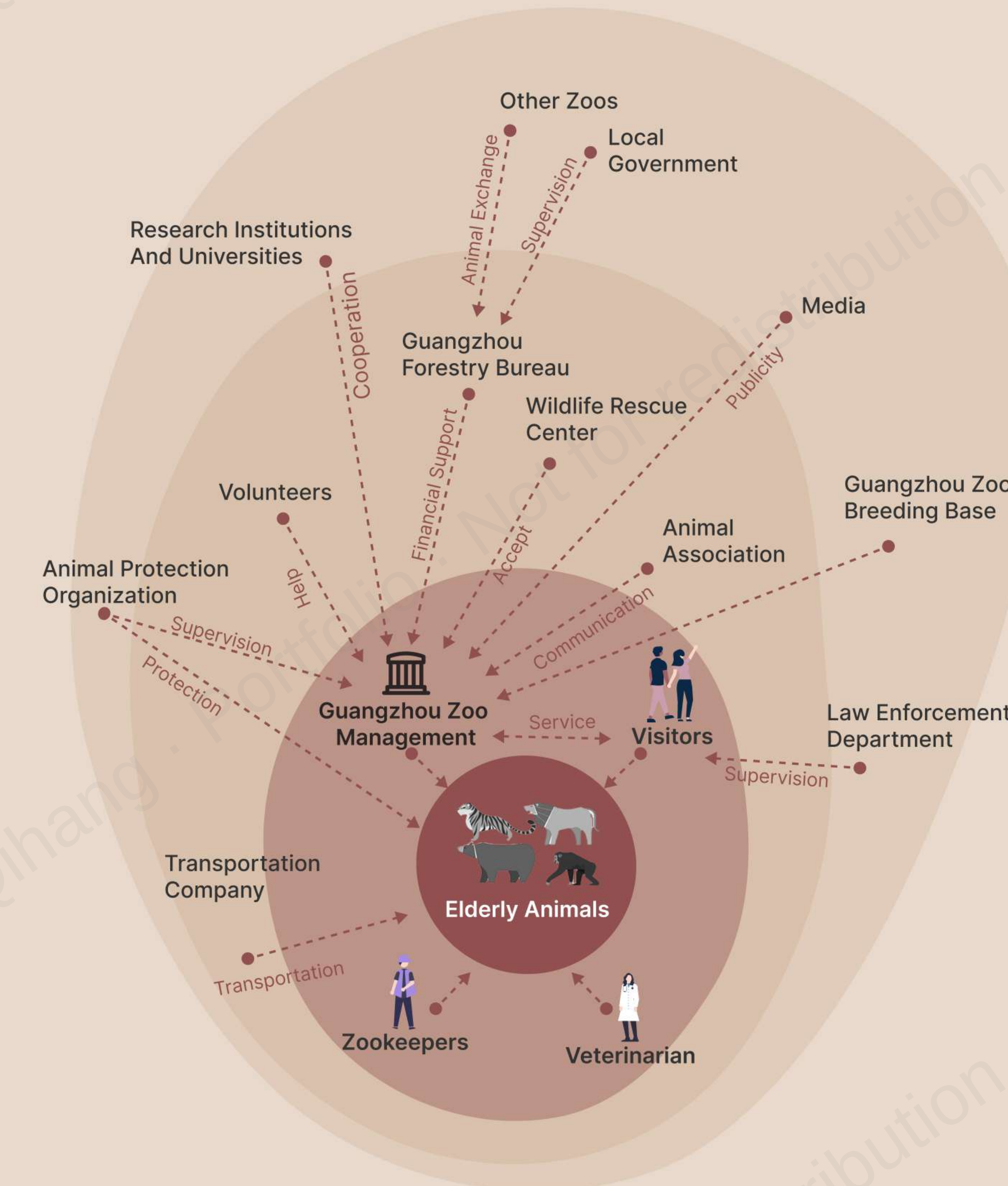


4 Persona

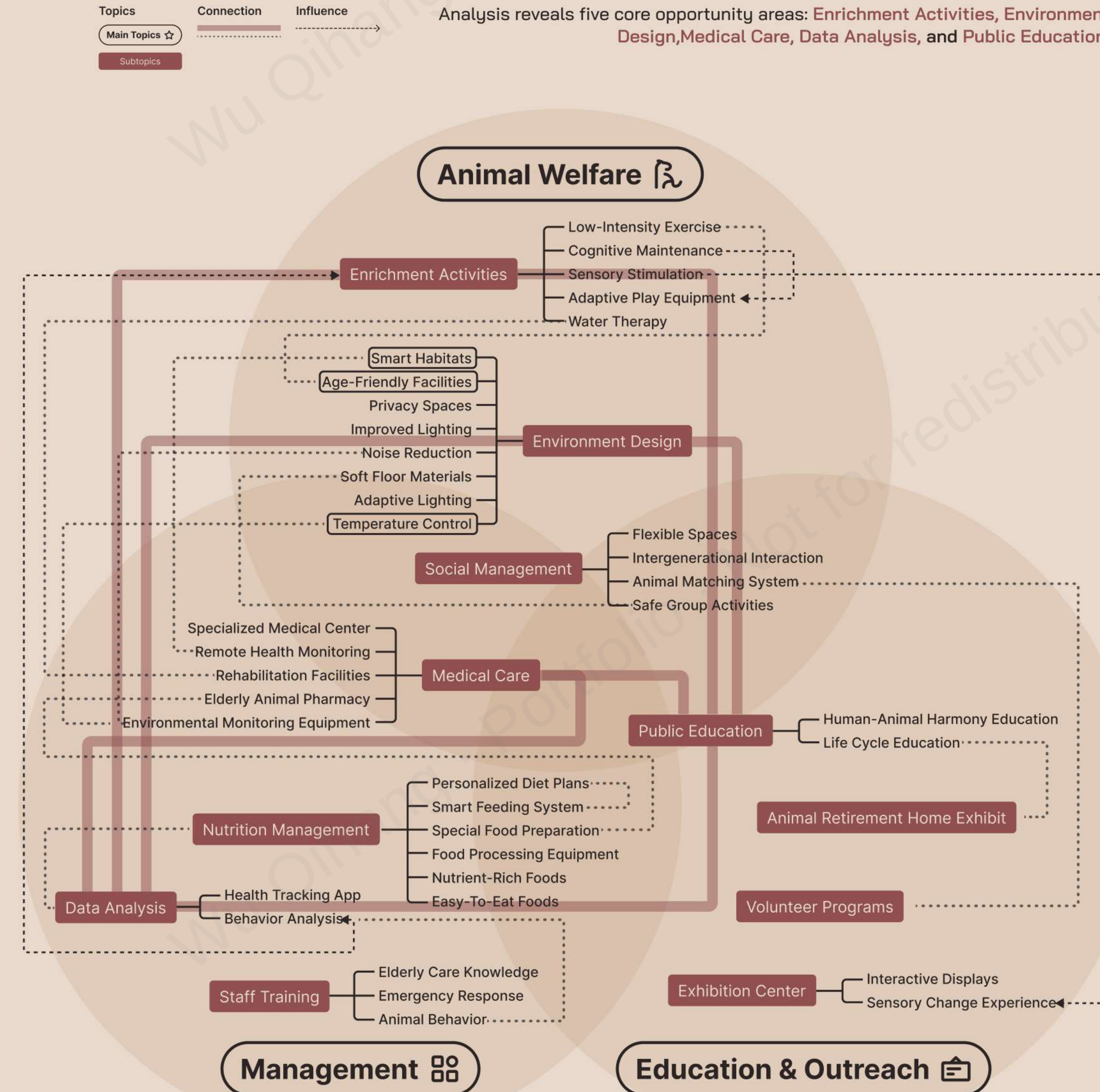


5 Stakeholder Map

The Stakeholder Map reveals interactions between core stakeholders (**Guangzhou Zoo Management, Zookeepers, Veterinarians, Visitors**) and supporting organizations, helping identify critical pain points and design opportunities within the zoo ecosystem.



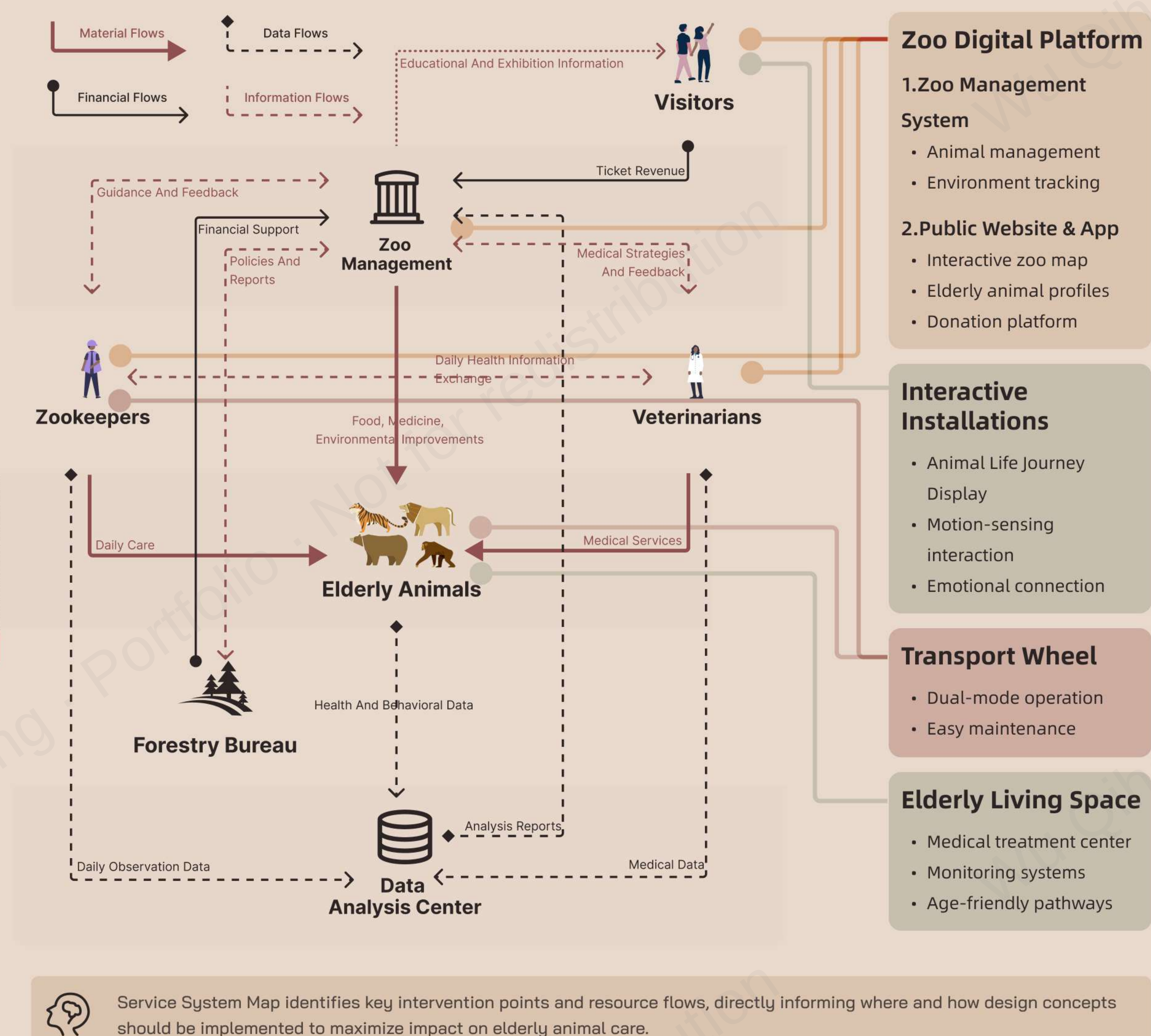
6 Knowledge Map



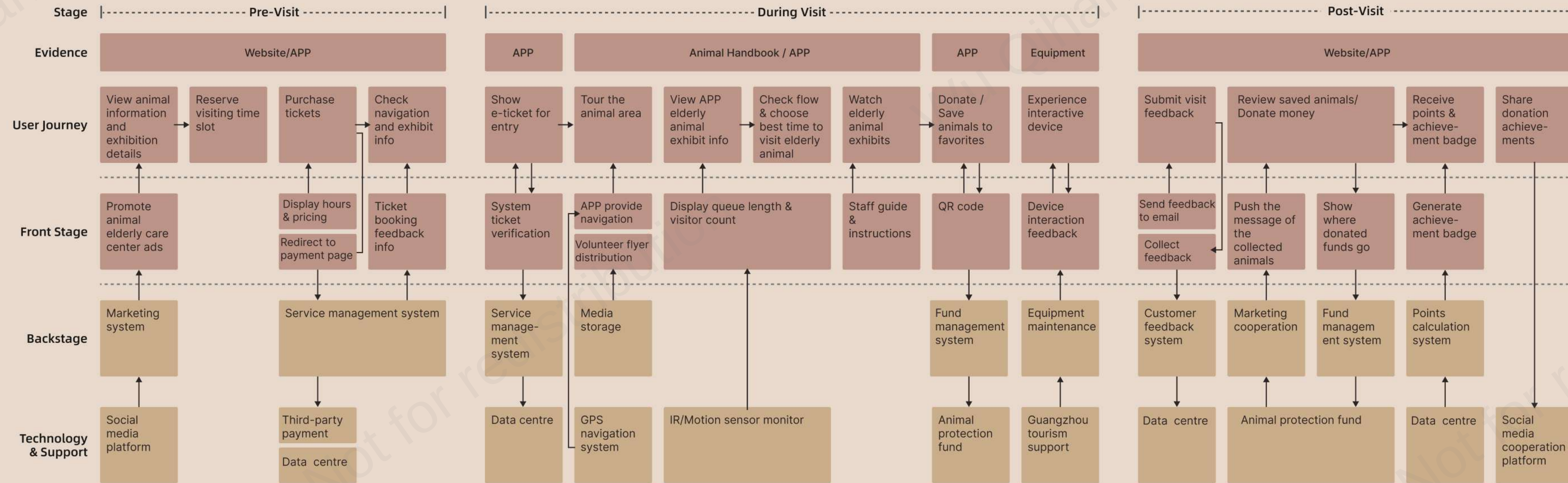
7 Case Study



8 System Map And Concept



9 Service Blueprint



10 Zoo Digital Platform Structure



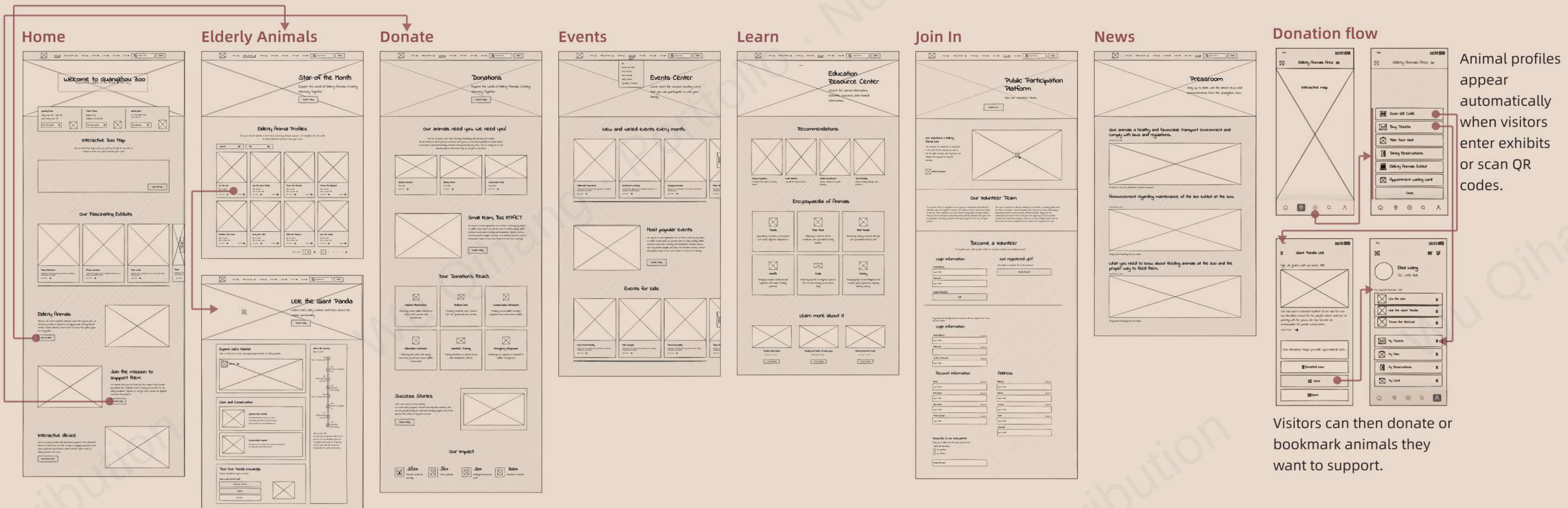
11 Wireframe

User Feedback & Improvements



- Navigation Issue**
Unclear menu hierarchy for different roles
Implement **role-based navigation** with distinct sections for veterinarians, staff, and directors
- Emergency Report Interface**
Overwhelming information density
Simplified to **essential animal data only** for rapid response

Public Website & App



12 Public Website & App High Fidelity

Enhances visitor engagement and facilitates donations

Logo



Continuous line symbolizes the cycle of life



Earliest iconic animals
Represents longevity
Symbolize good fortune

Typography

Regular Bold
DM Sans Aa 123

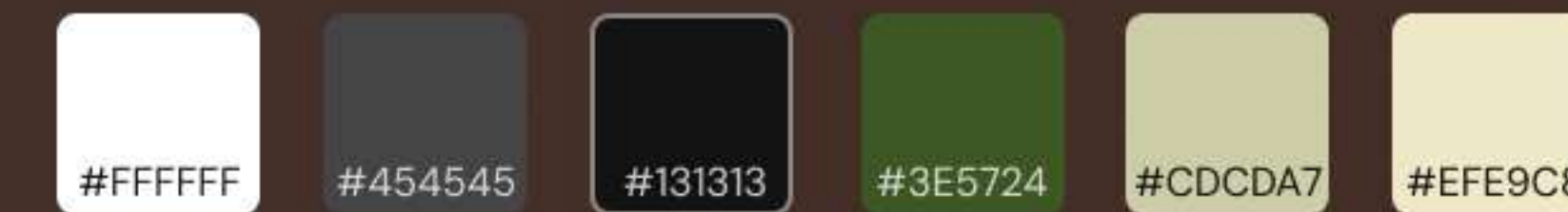
Type Size Weight
H1 48px Bold

H2 32px Bold

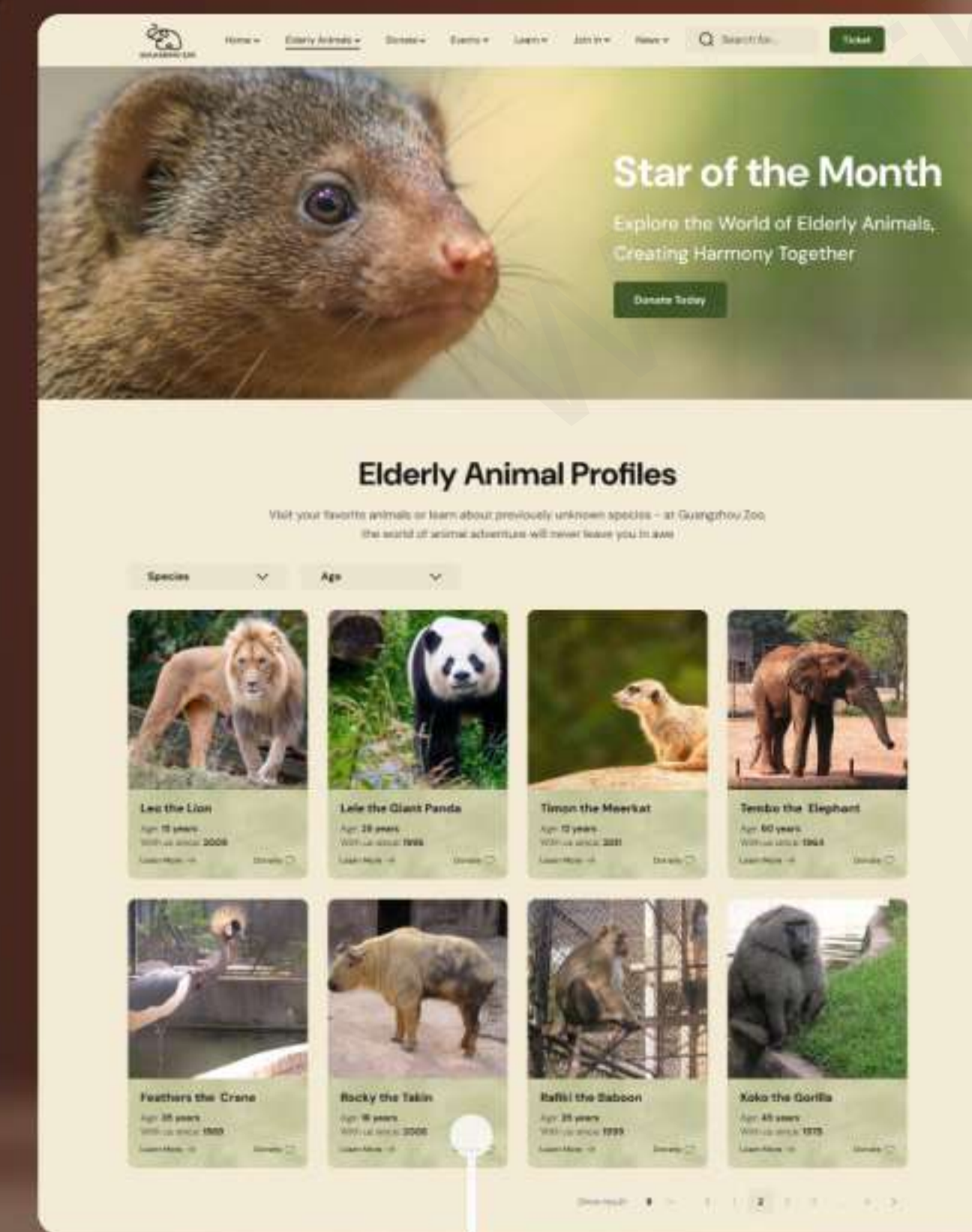
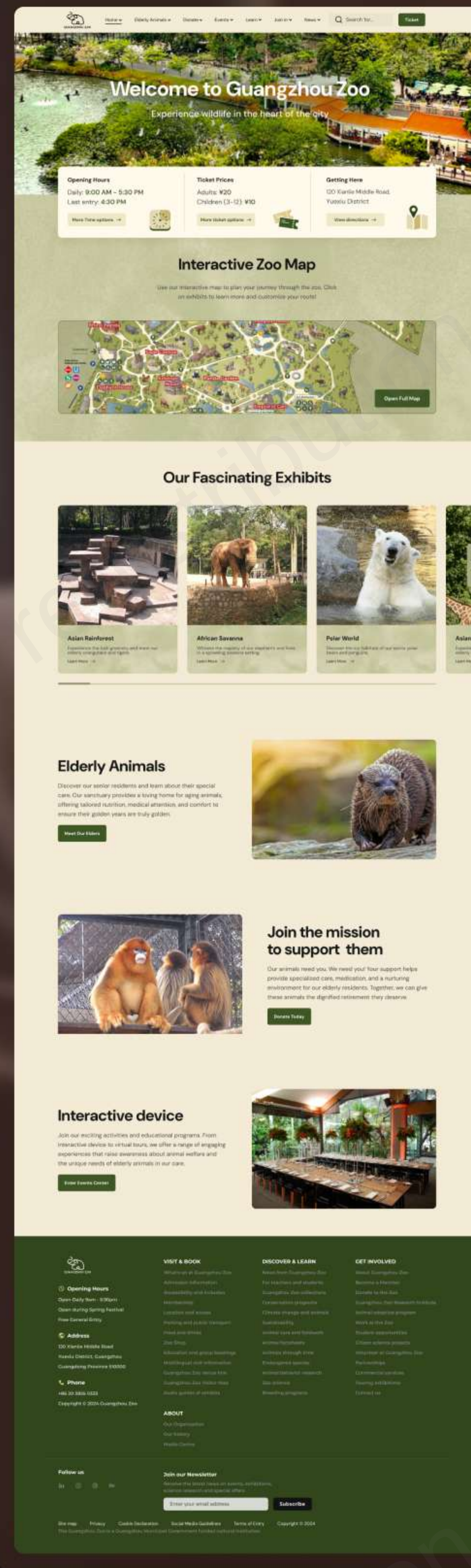
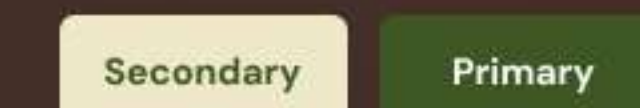
H3 24px Medium

Body 16px Regular

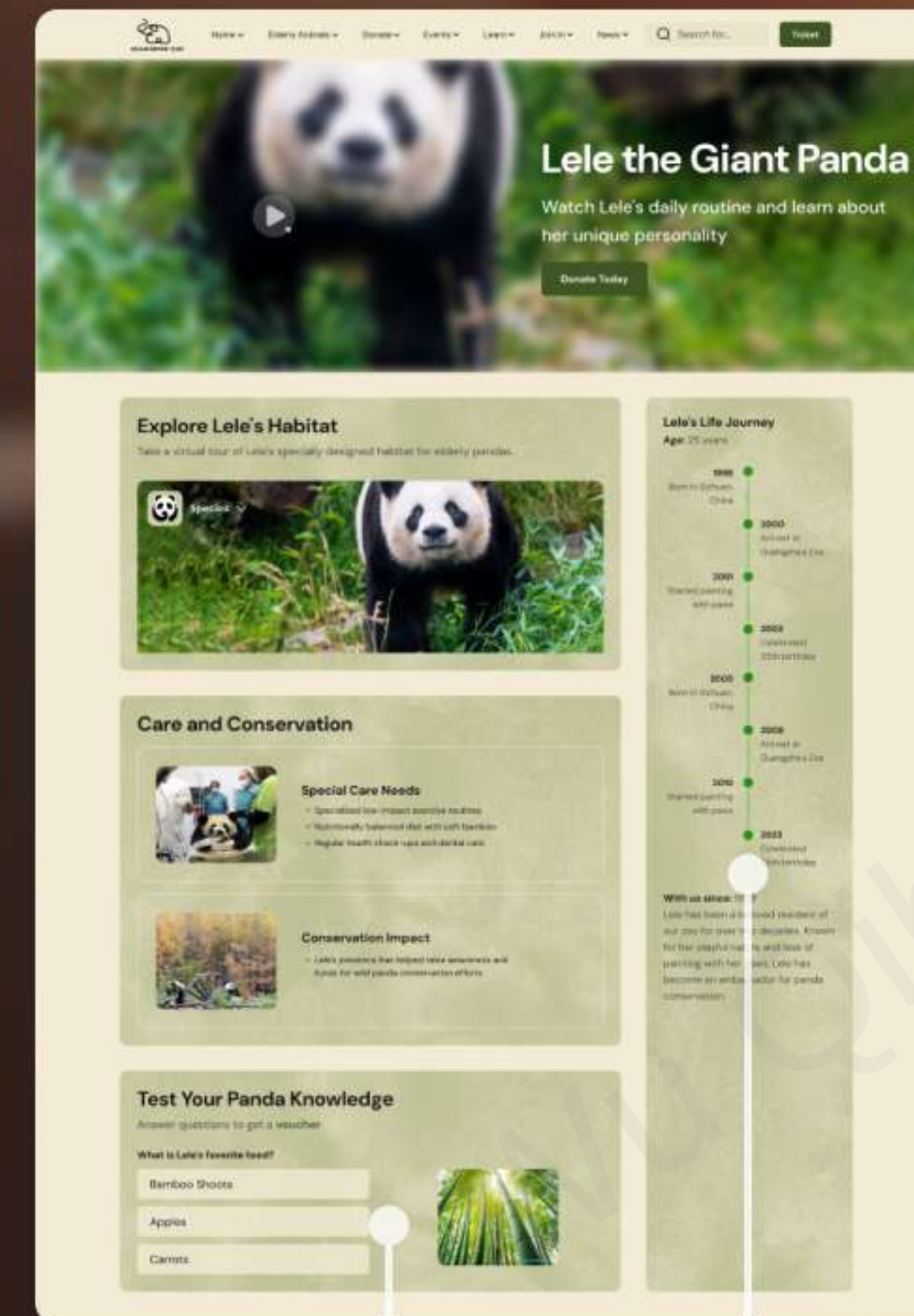
Color Palette



Button

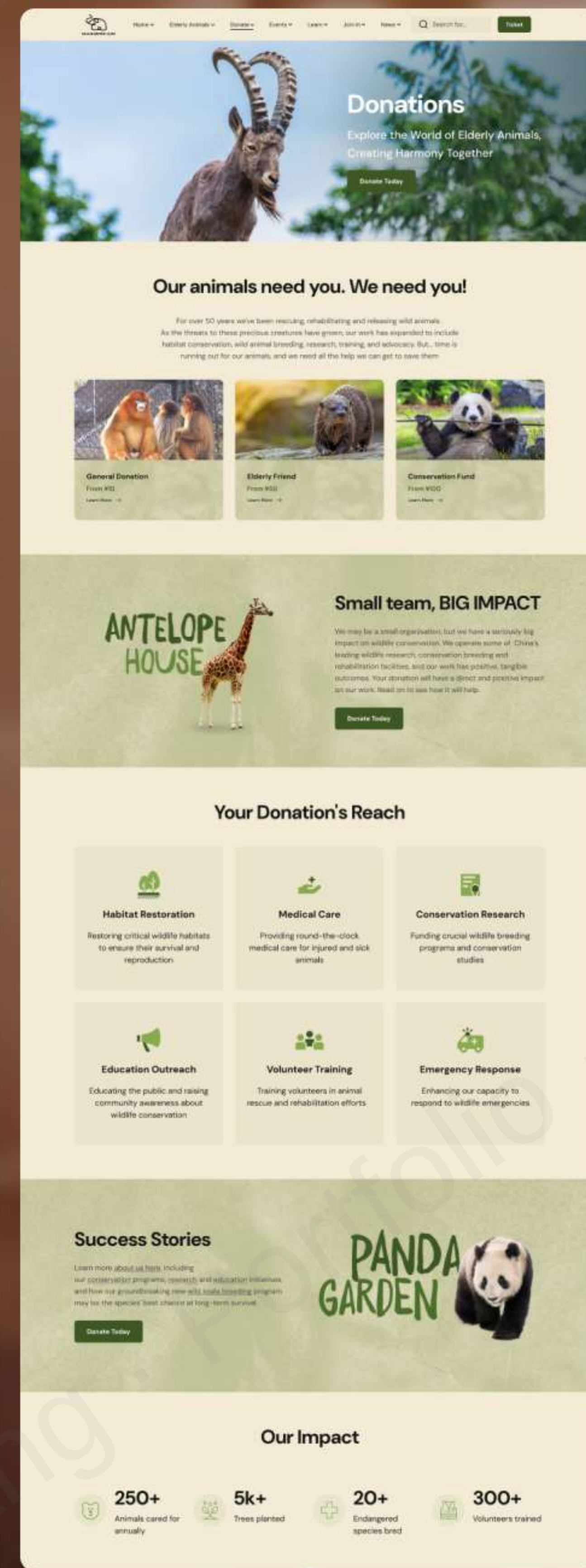


Elderly animal profiles with clickable cards for details

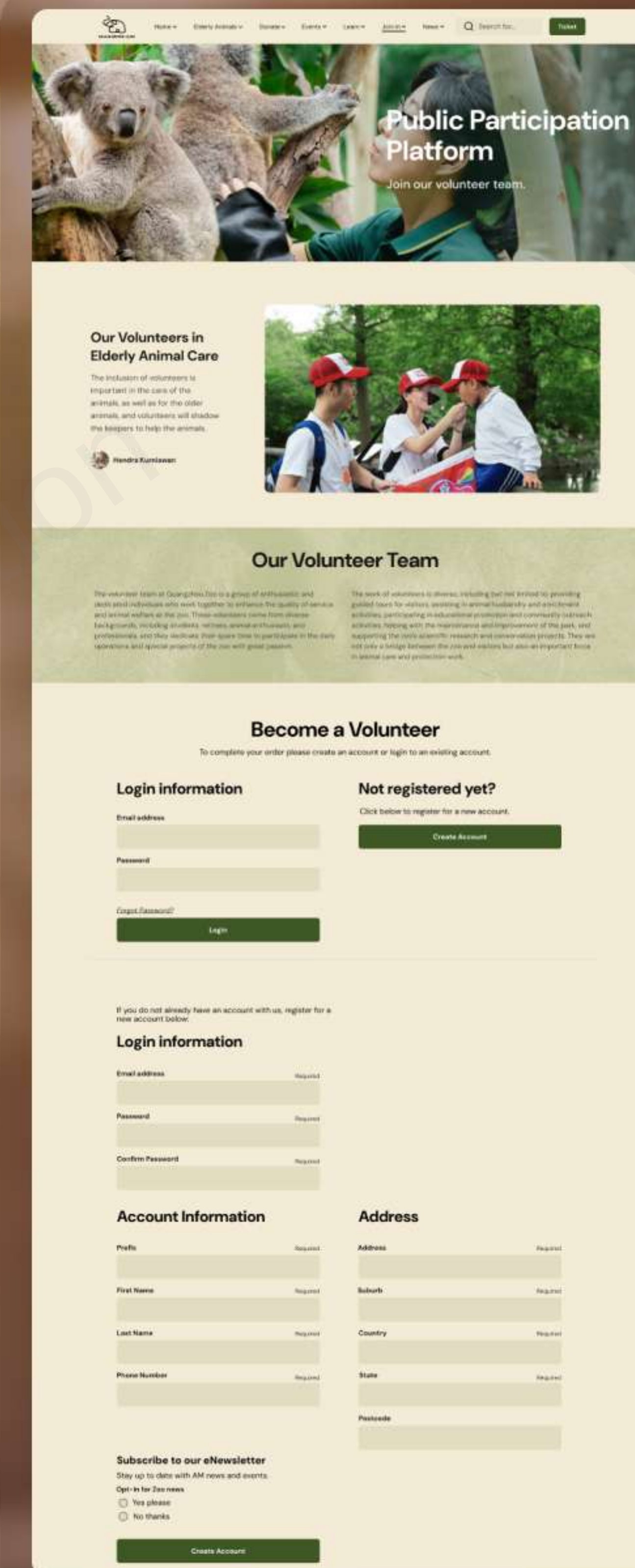
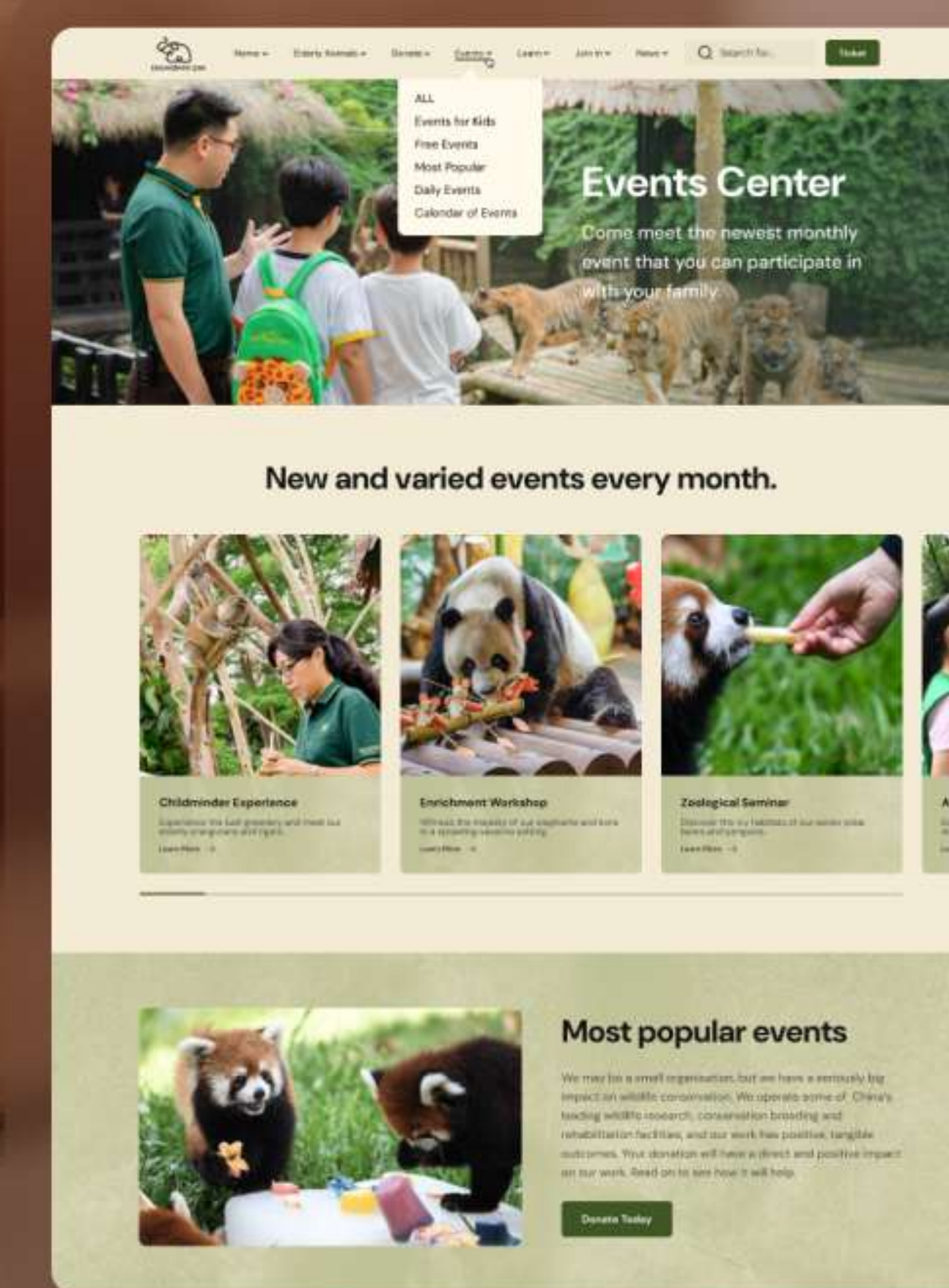


A historical timeline records important memories from each stage

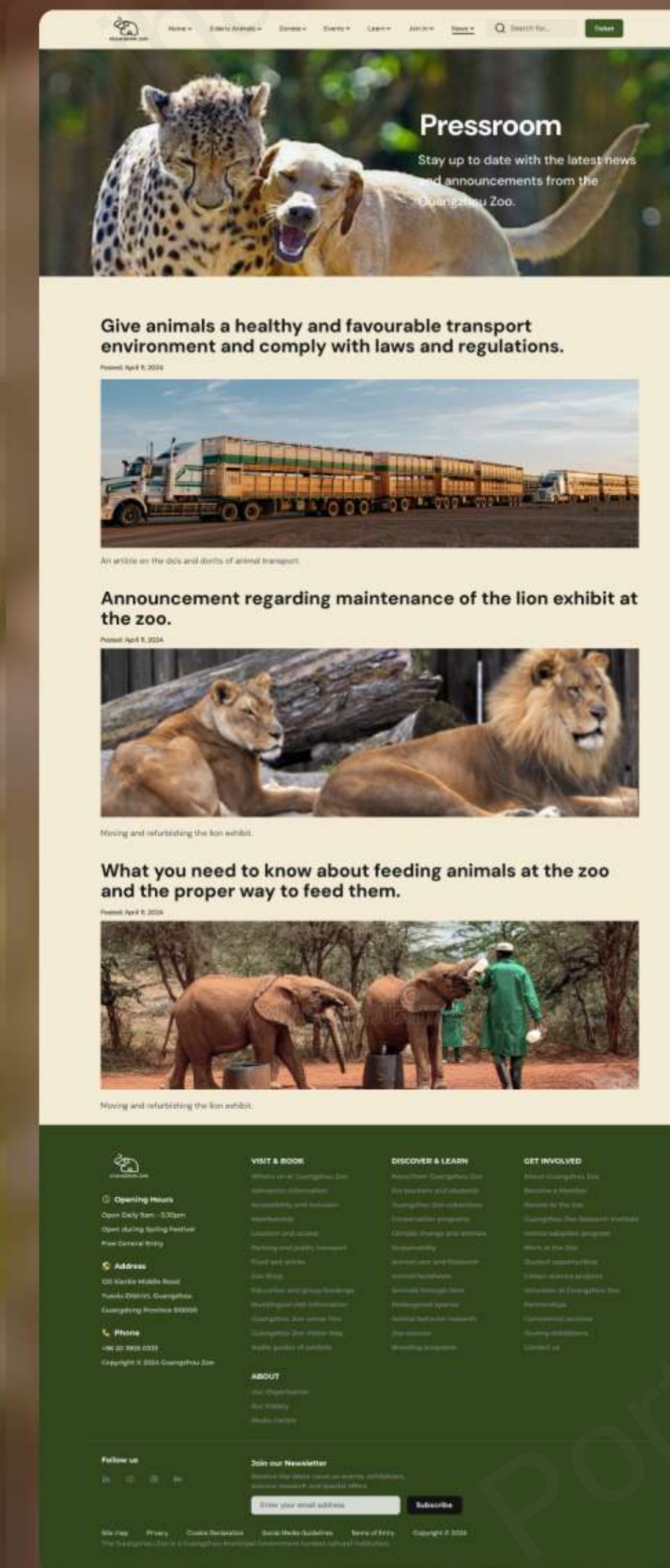
Interactive Q&A rewards points for ticket discounts



Donation page shows endearing aspects to encourage visitors to support through donations



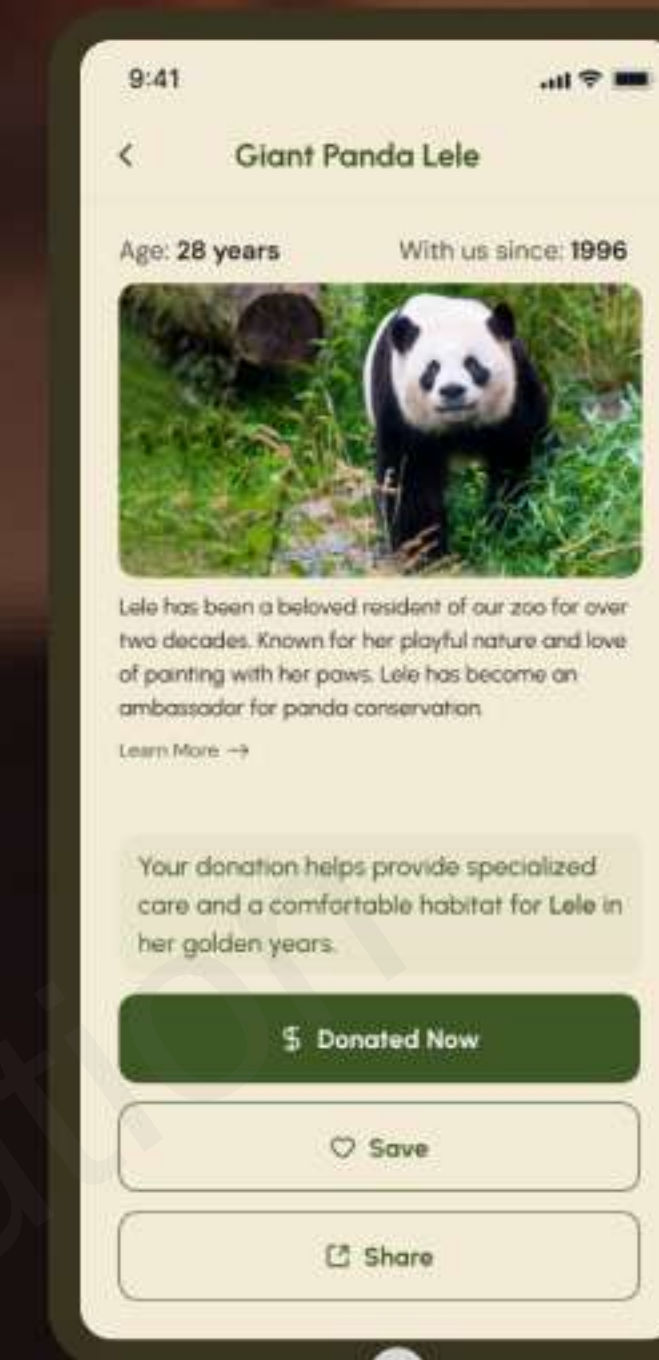
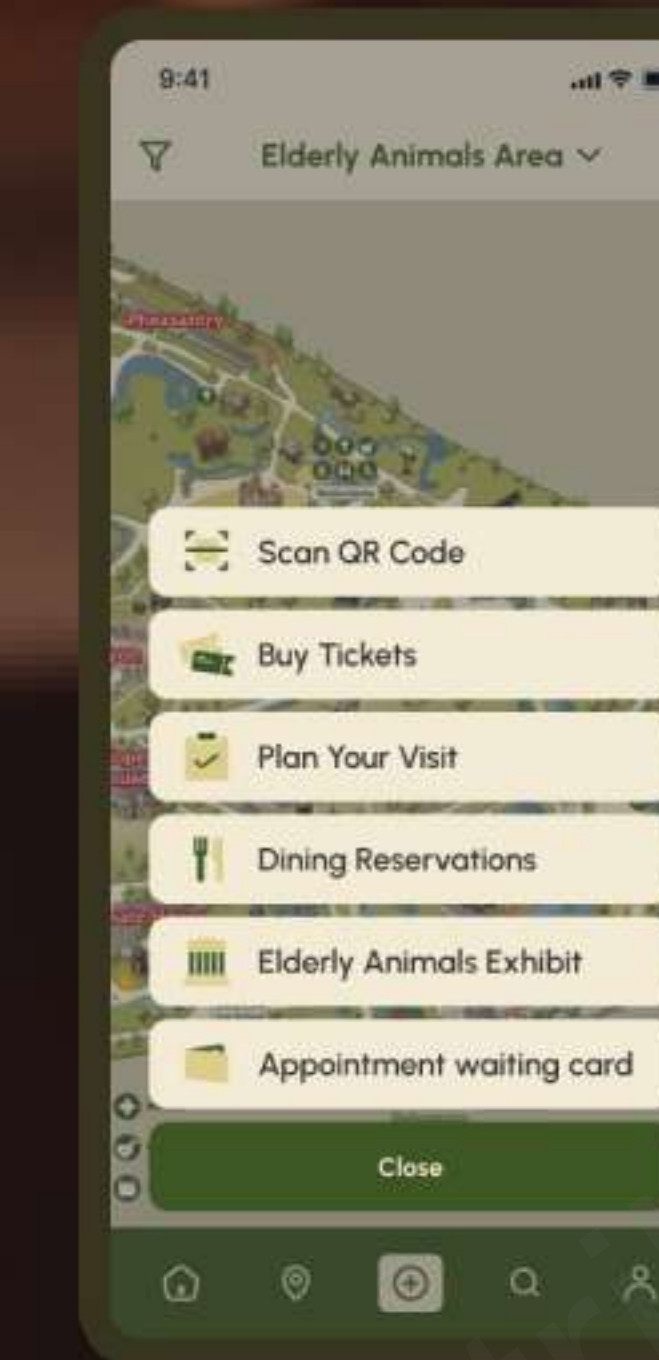
Public participation page enables volunteers to join care programs



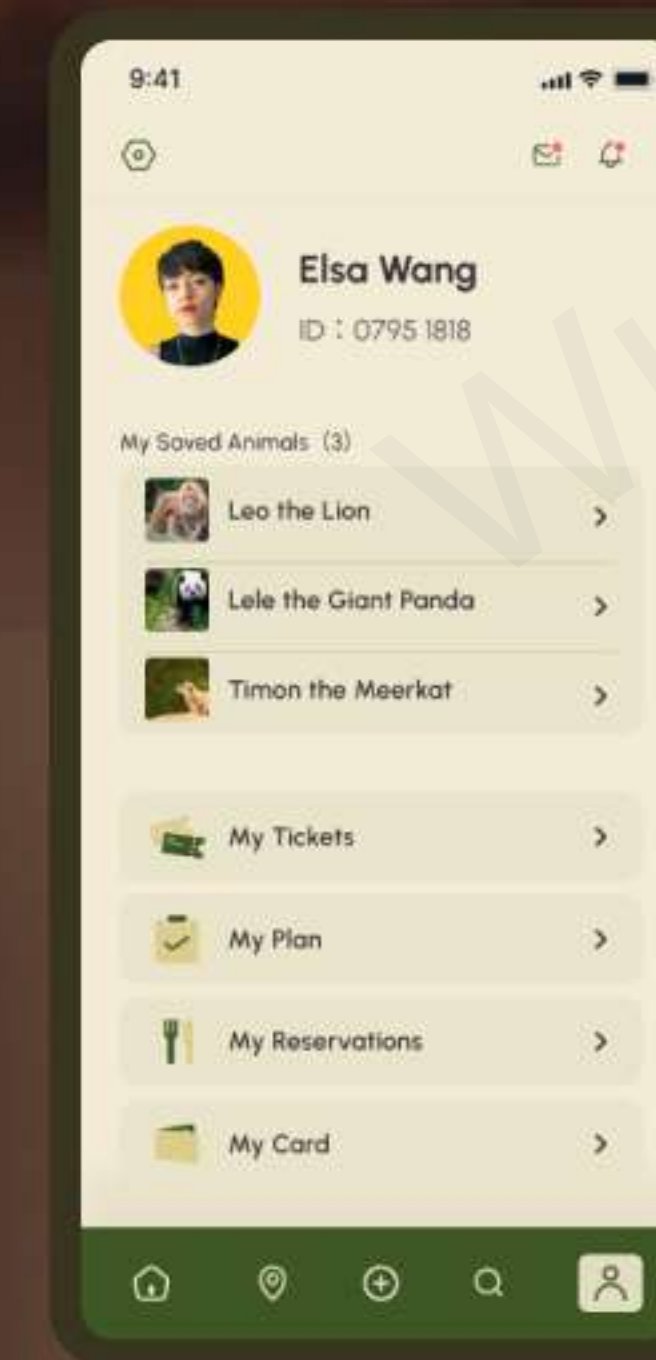
The core area displays information most important to visitors: Opening hours, ticket purchasing portal, and directions to the facility



Interactive map features:
• Real-time location tracking
• Animal exhibit highlights
• Accessibility routes



System automatically pushes elderly animal information when visitors are at specific exhibits, encouraging donations



Browsing the website

Based on our previous field survey questionnaire, Family Activities ranked highest in Zoo Visit Purpose. This scenario simulates families browsing the zoo's website

13 Product Design

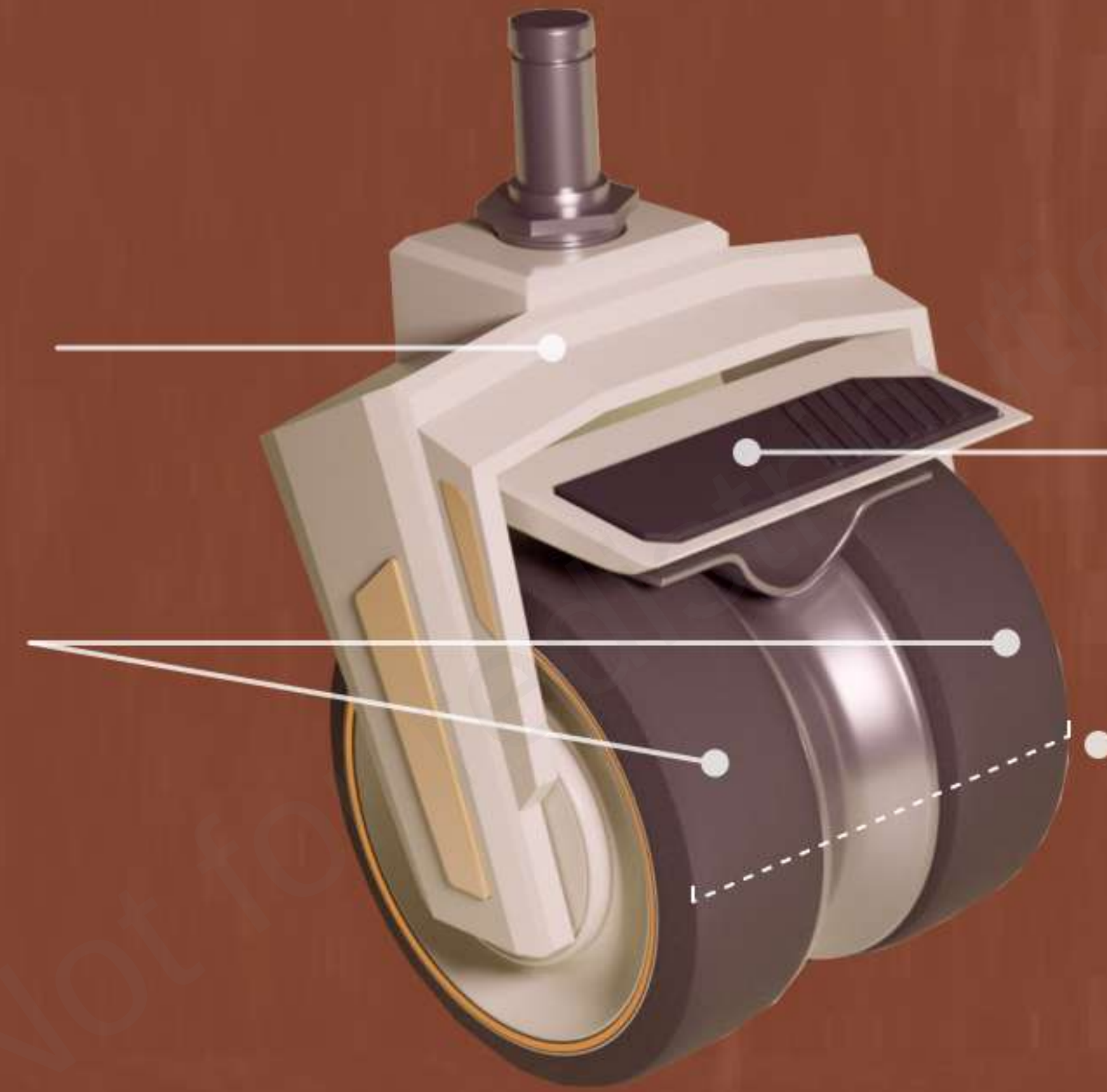
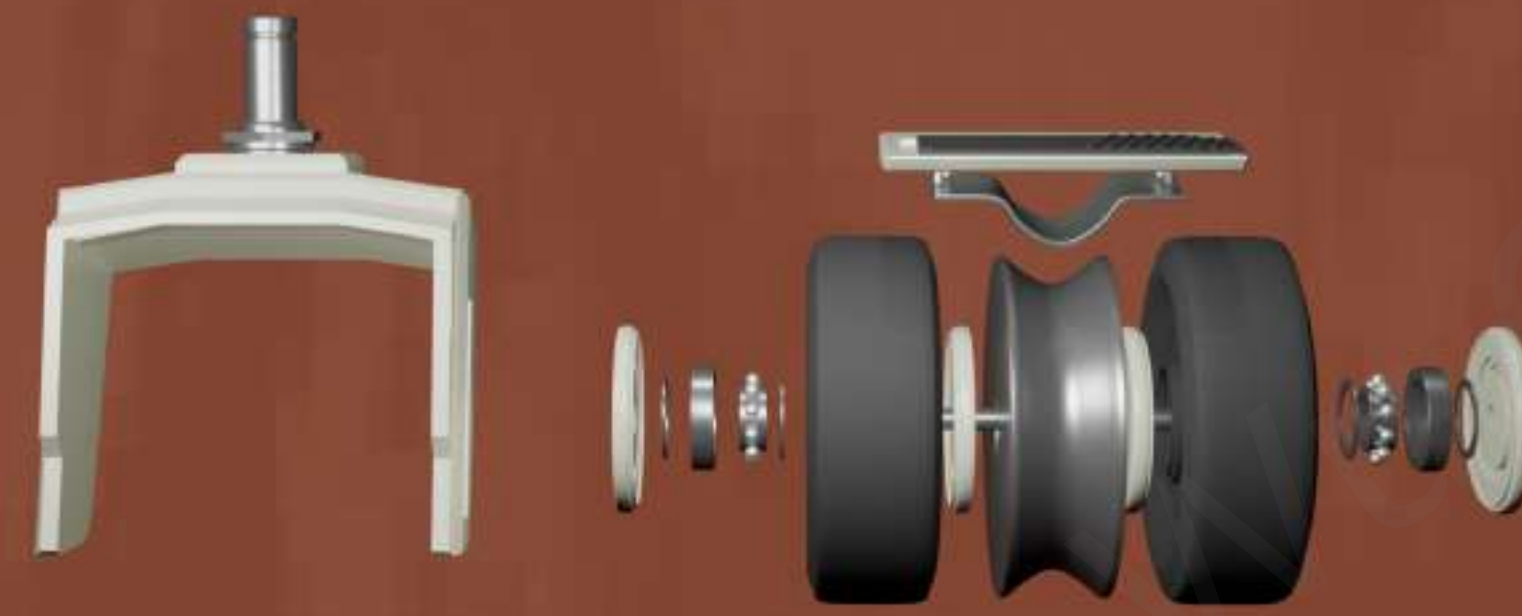
Improves animal transport efficiency and safety

Dual-Purpose Wheel for Animal Transport



Design Objective

A wheel system that operates on both regular roads and special tracks for animal transportation



2. Safety

- Braking system effective on both road and track surfaces

3. Specifications

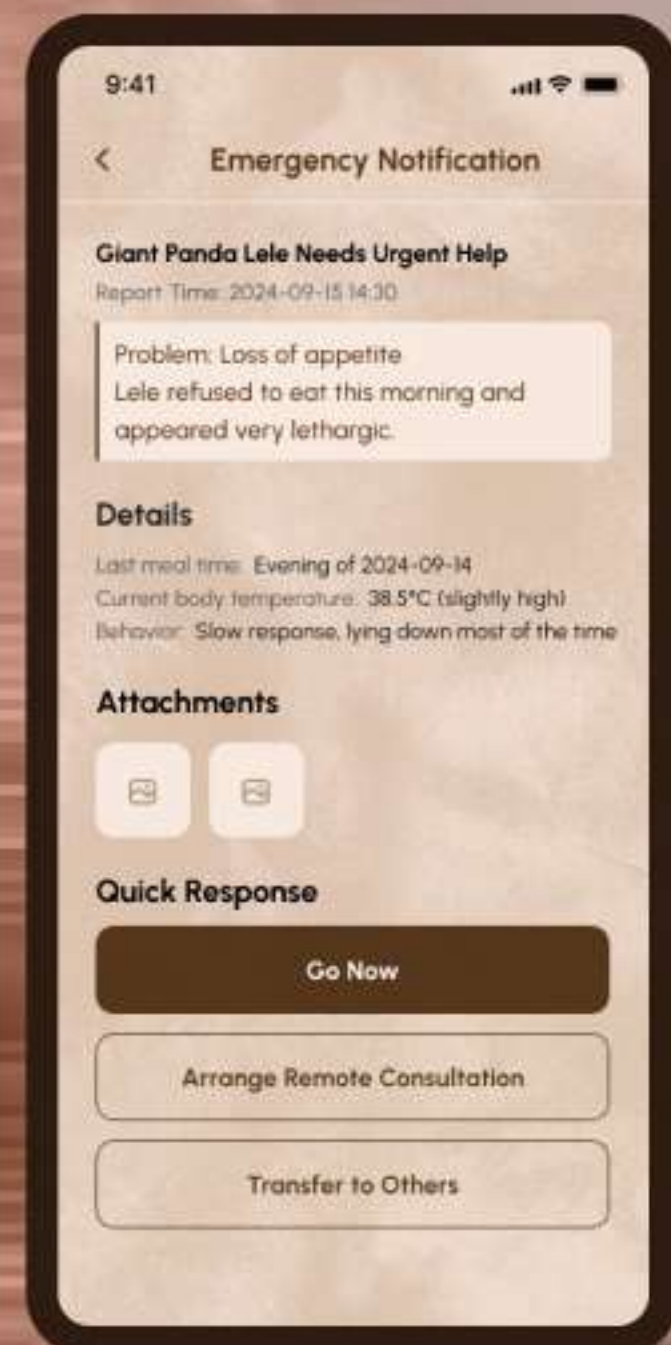
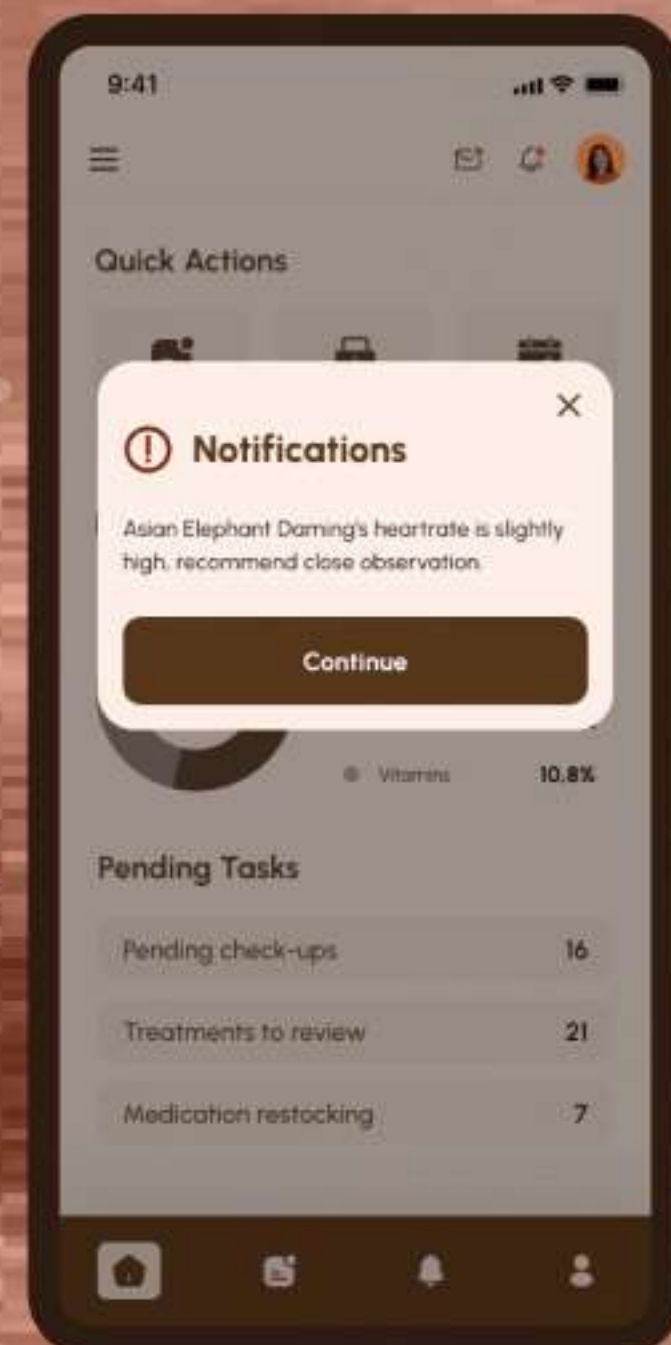
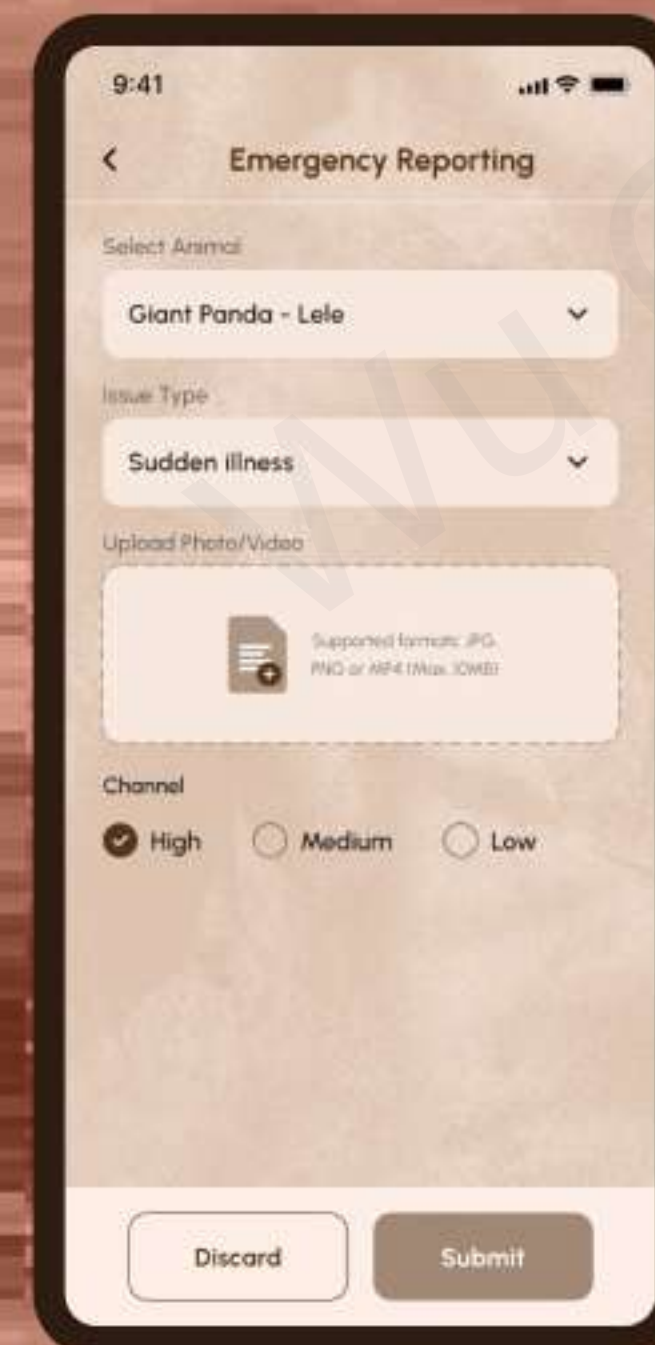
- 5-inch wheel

1. Key Features

- Adaptable: V-shaped structure for seamless switching between surfaces
- Stable: Double wheel design with large diameter for smooth transport
- Quiet: Noise reduction to prevent animal distress



Staff can report abnormal animal conditions through quick actions.



Veterinarians receive instant notifications and can choose appropriate response actions for timely care.

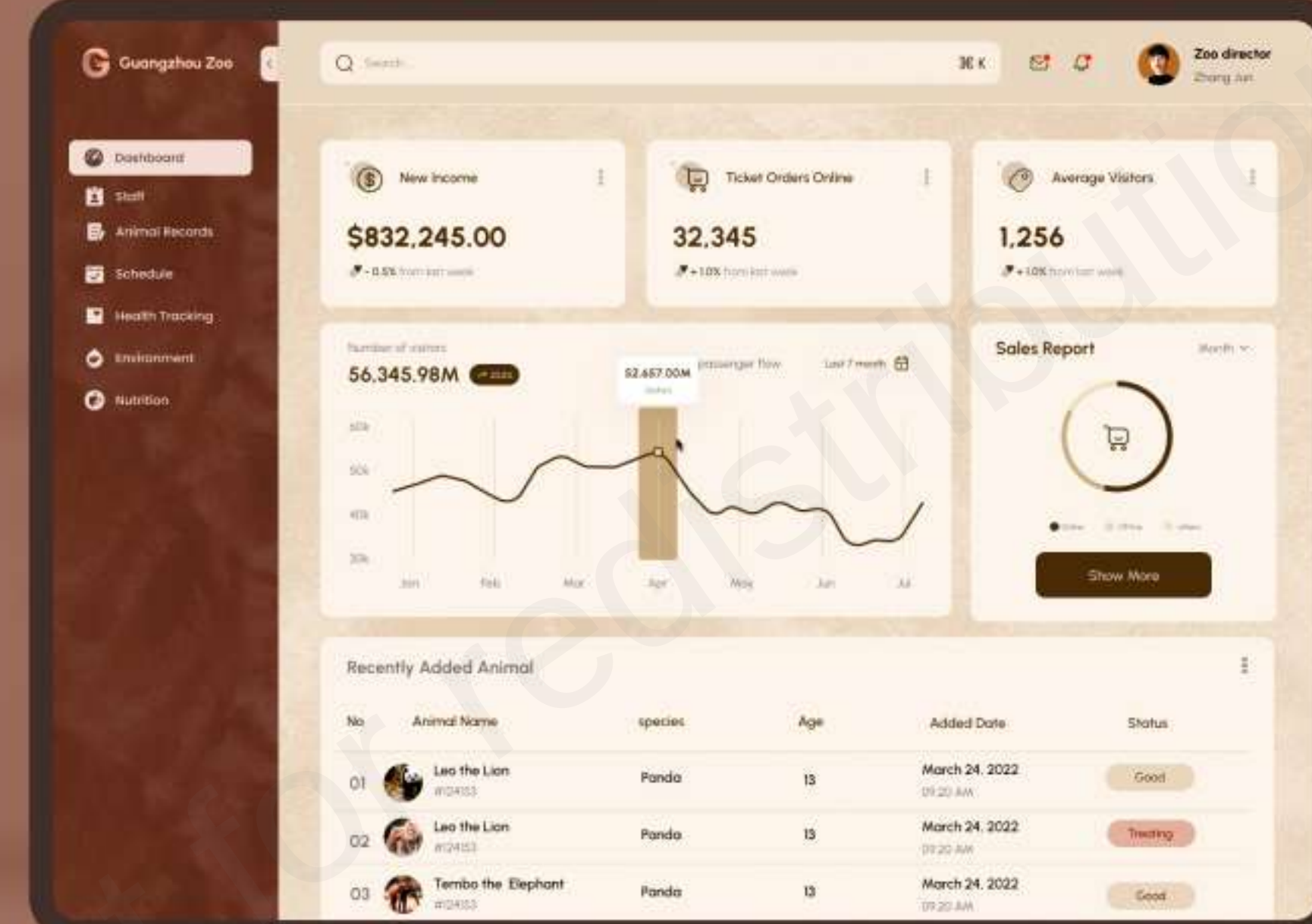
14 Zoo Management System(Web & Mobile) High Fidelity

Streamlines animal welfare management and tracking

The right side showcases a high-fidelity design for a B2B staff management system tailored for zoo operations. This system integrates features such as health monitoring, nutrition planning, and environmental tracking, enabling staff and veterinarians to efficiently manage elderly animal care.



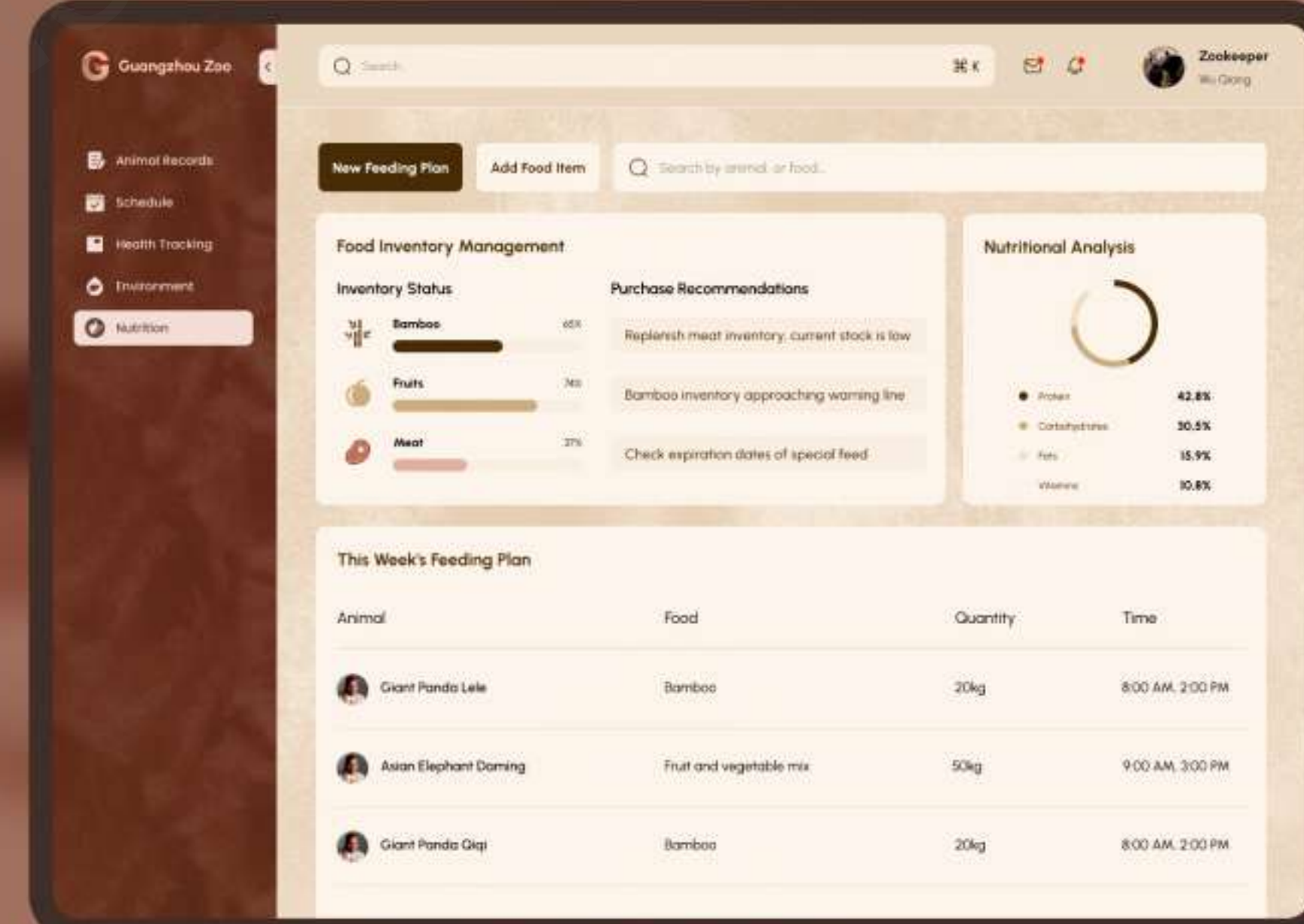
Dashboard



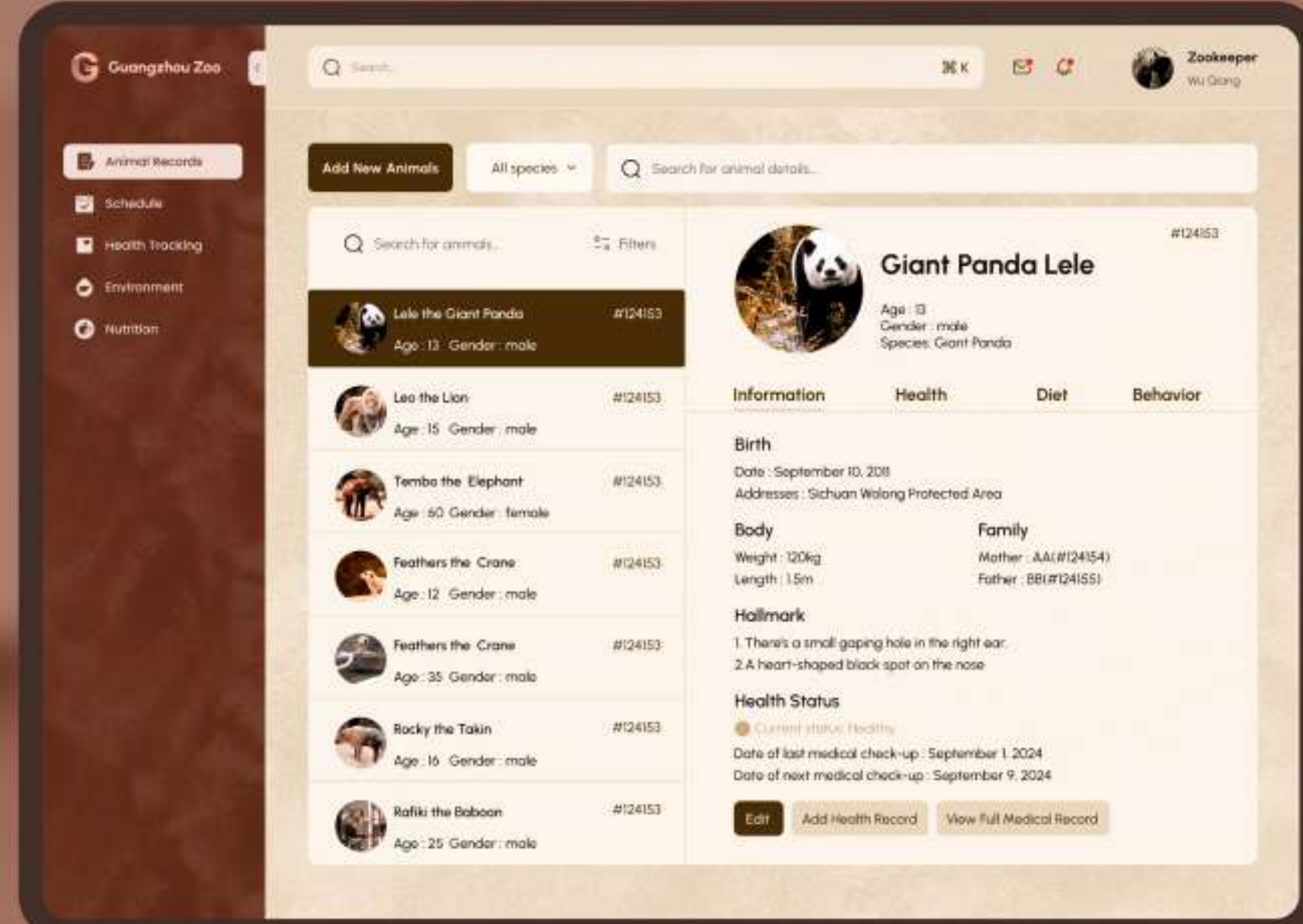
Schedule



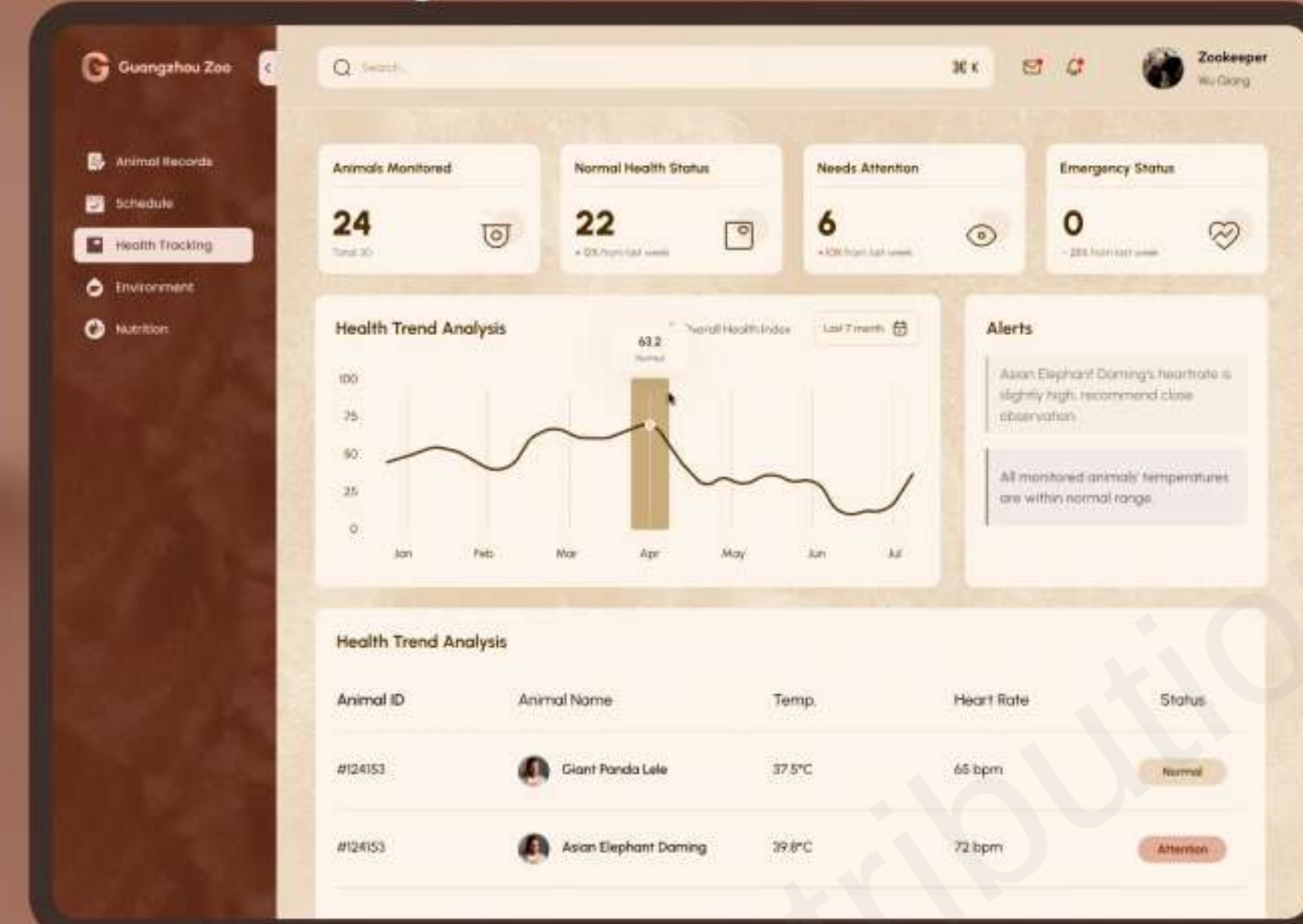
Nutrition



Animal Records



Health Tracking(Vet View)



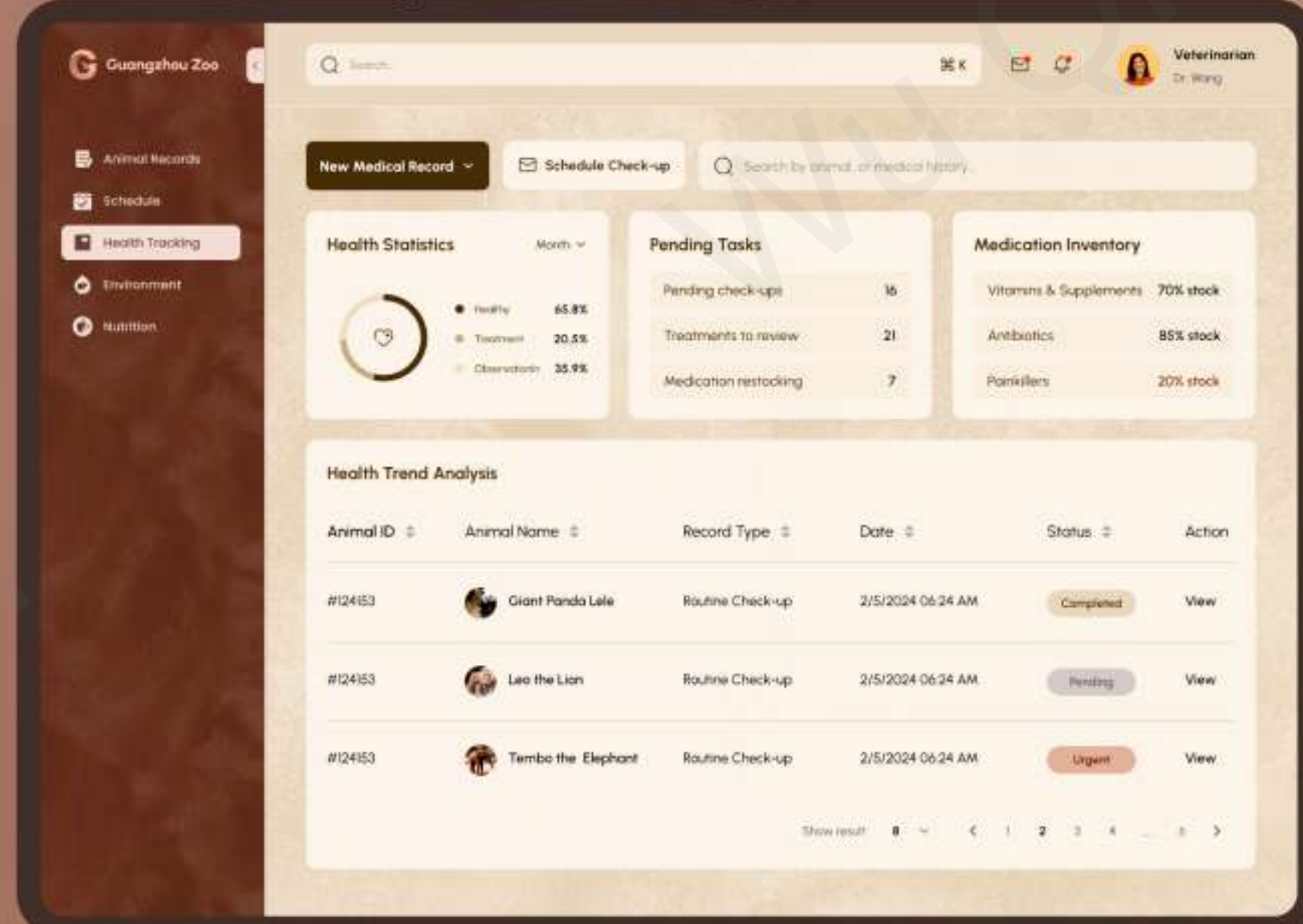
Staff

Staff ID	User Name	Position	Email	Status
#0403	Christian	Manager	Christian@zoo.com	On
#0403	Christian	Breeder	Christian@zoo.com	Leave
#0403	Christian	Veterinarian	Christian@zoo.com	On
#0403	Christian	Manager	Christian@zoo.com	On
#0403	Christian	Breeder	Christian@zoo.com	Leave
#0403	Christian	Veterinarian	Christian@zoo.com	On
#0403	Christian	Veterinarian	Christian@zoo.com	On

Environment



Health Tracking(Staff View)



15 Architectural Design

Provides specialized care spaces for elderly animals



Entrance Design

- Ramps and elevators provided for visitor access
- Shallow water features designed for animal interaction



Circulation System

- Visitor and staff circulation paths completely separated
- Main viewing routes located on second-floor elevated walkways with high-strength glass barriers to prevent noise and animal disturbance



Health Suite

- Central workstations for daily management and health monitoring
- Integrated channel system connecting to external medical facilities

Guangzhou Zoo Elderly Animal Center

A customized retirement environment for aging tigers, lions, bears, and monkeys.



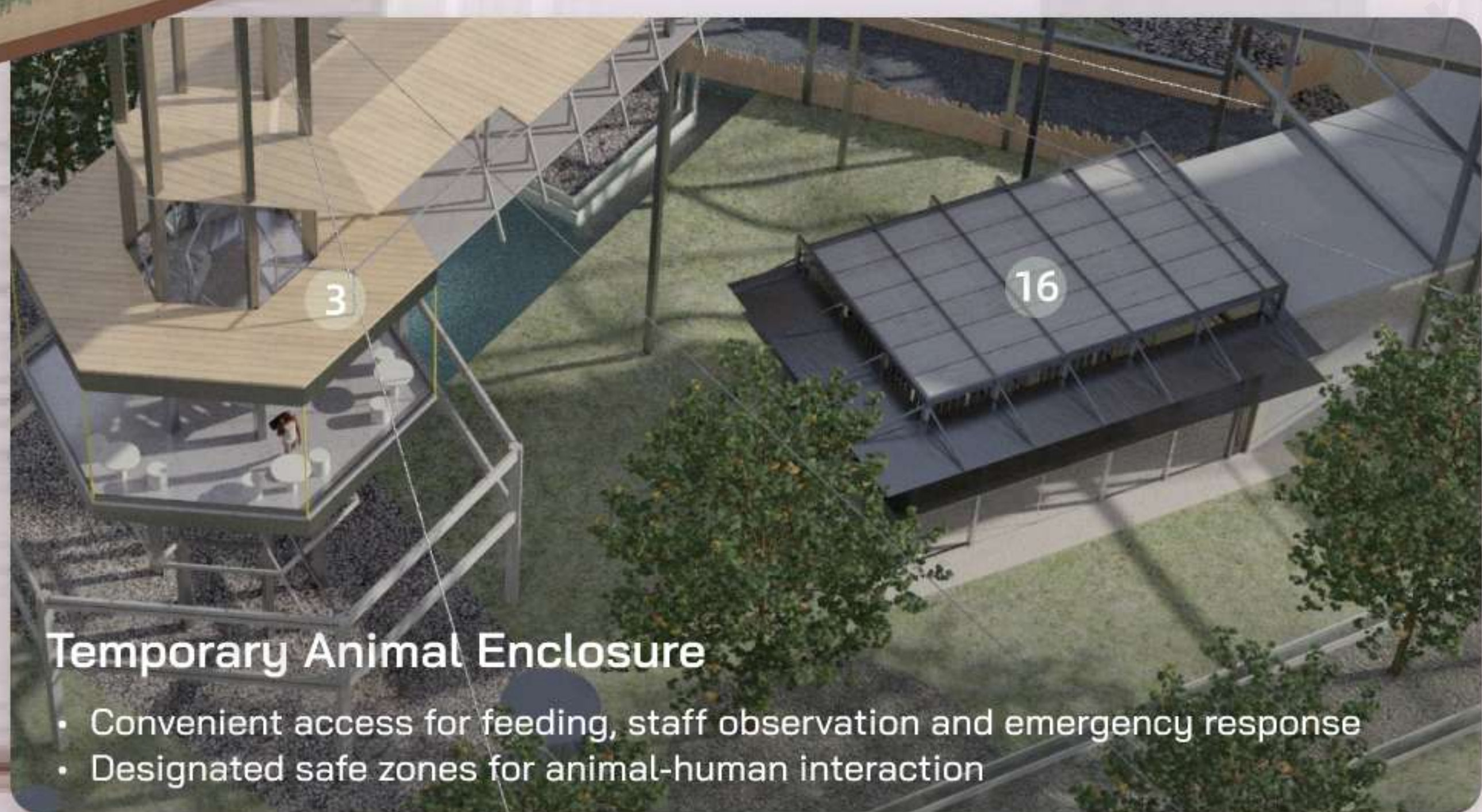
Legend

- 1. Visitor Entrance
- 2. Tiger Viewing Tower
- 3. Monkey Viewing Tower
- 4. Lion Viewing Tower
- 5. Bear Viewing Tower
- 6. Exit
- 7. Tiger Zone
- 8. Monkey Zone
- 9. Lion Zone
- 10. Bear Zone
- 11. Workstation Entrance
- 12. Surveillance Room
- 13. Health Suite
- 14. Workstation Restroom
- 15. Storage Room
- 16. Temporary Animal Enclosure



Activity Areas

- Activity areas specially designed for elderly animals
- Facilities provide comfort and low maintenance, with balanced sunlight and shade areas for resting needs



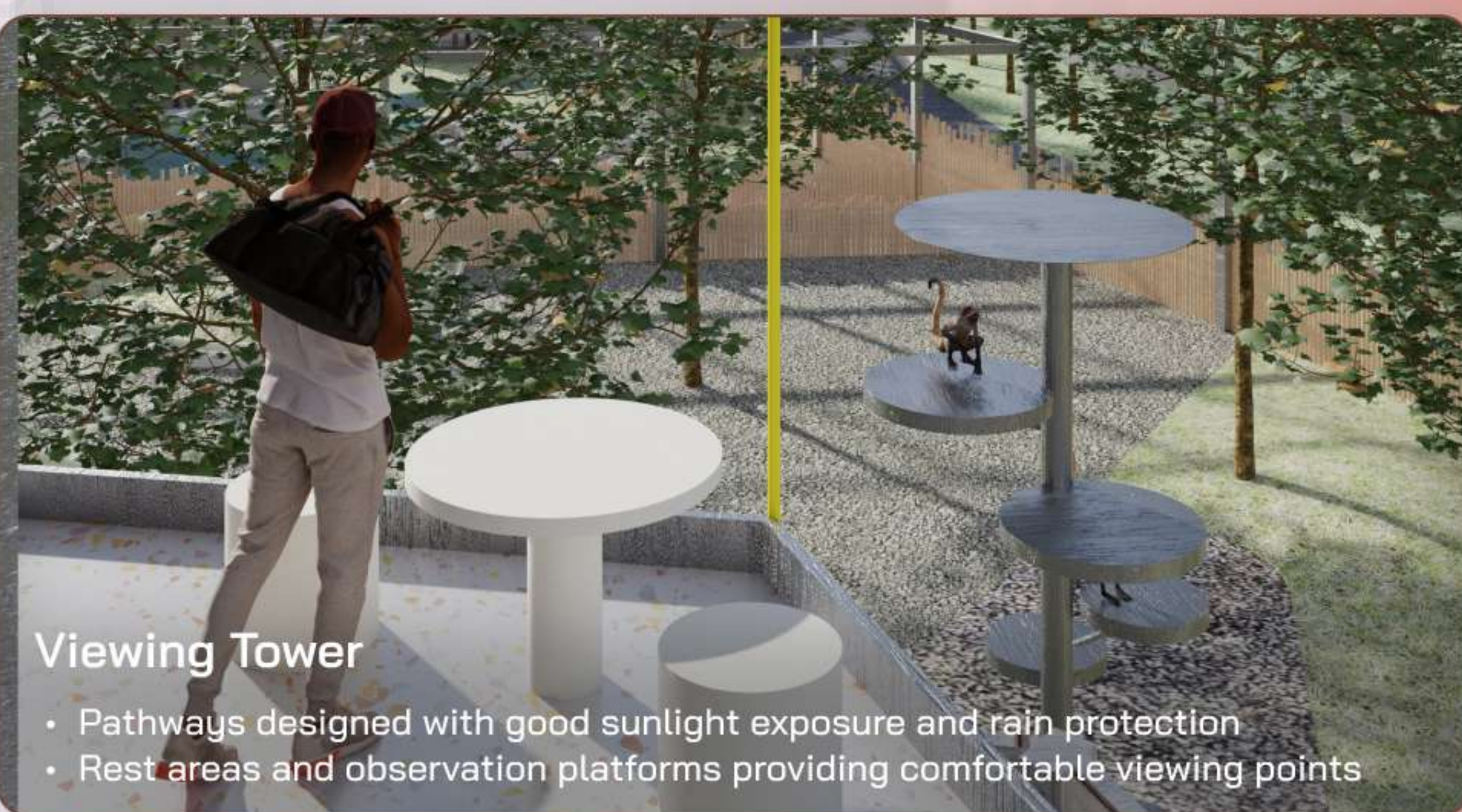
Temporary Animal Enclosure

- Convenient access for feeding, staff observation and emergency response
- Designated safe zones for animal-human interaction



Top View

- Visitor Flow
- Staff Flow
- Scale in meters



Viewing Tower

- Pathways designed with good sunlight exposure and rain protection
- Rest areas and observation platforms providing comfortable viewing points

16 Interactive Installations

Engages visitors through immersive educational experiences



1 Visual Journey Narrative

Multi-layered Display: Creates spatial depth symbolizing the journey through life
Warm Color Palette: Sunset-inspired backdrop representing the passage of time

2 Interactive Light Experience

Motion-Responsive Illumination: LED strips activated by visitor movement
Sequential Activation: Light patterns following the viewer's journey

3 Educational installations

Visual Metaphors: Lion silhouettes representing different life stages
Sound Integration: Subtle ambient sounds matching each life stage

Introduction

The installation features a multi-layered display with printed Sintra board backdrops and engraved acrylic lions, illuminated by LED strips that activate as **visitors pass by**.

Four interactive stations are seamlessly integrated into the **architectural design** of the elderly animal zones, each dedicated to a specific species: **Brown Bears, Stub-nosed Monkeys, South China Tigers, and Asiatic Lions**. These installations feature interactive representations of the animals, paired with **voice-over narrations** to educate visitors on the importance of caring for aging animals and **fostering awareness** about their unique needs.



Welding LED Strips



Engraving Lion Pattern



Dyeing Acrylic Panels



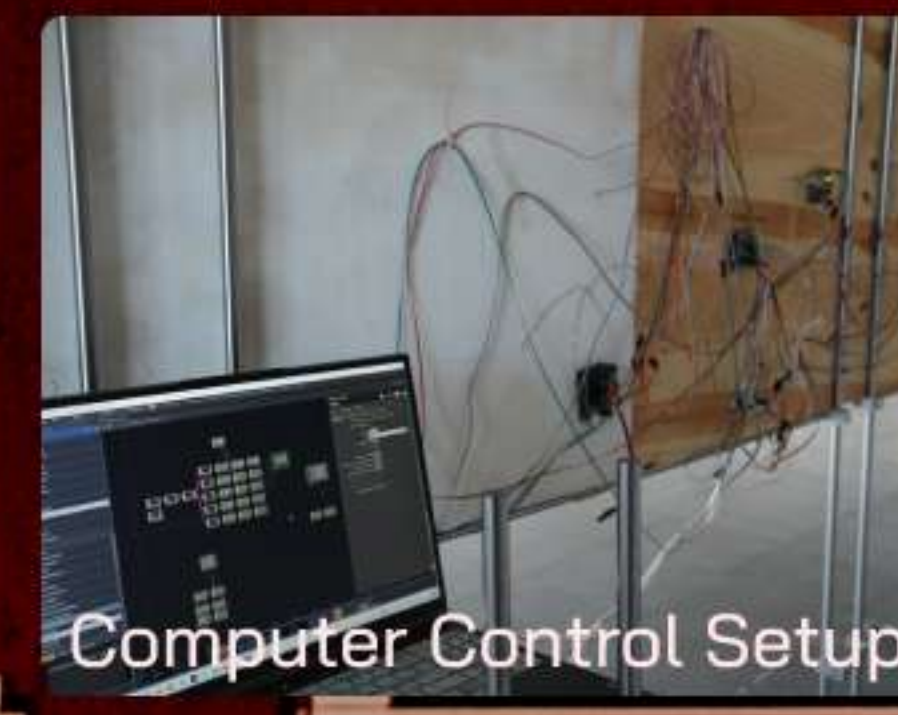
Assembling Display Frame



Installing Devices



Adjusting Circuit Wiring



Computer Control Setup



Equipment Testing



Single-User Experience



Multi-User Interaction

Arduino Code

Ultrasonic Sensor System

```
#define trigPin1 2
#define echoPin1 3
#define trigPin2 4
#define echoPin2 5
#define trigPin3 6
#define echoPin3 7
#define trigPin4 8
#define echoPin4 9
#define trigPin5 10
#define echoPin5 11

//Initial Data Handling And Range Mapping

//Initializes Serial Communication And Set Pin Modes
void setup() {
  Serial.begin(9600);

  pinMode(trigPin1, OUTPUT);
  pinMode(echoPin1, INPUT);

  pinMode(trigPin2, OUTPUT);
  pinMode(echoPin2, INPUT);

  pinMode(trigPin3, OUTPUT);
  pinMode(echoPin3, INPUT);

  pinMode(trigPin4, OUTPUT);
  pinMode(echoPin4, INPUT);

  pinMode(trigPin5, OUTPUT);
  pinMode(echoPin5, INPUT);
}

long readUltrasonicDistance(int trigPin, int echoPin) {
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

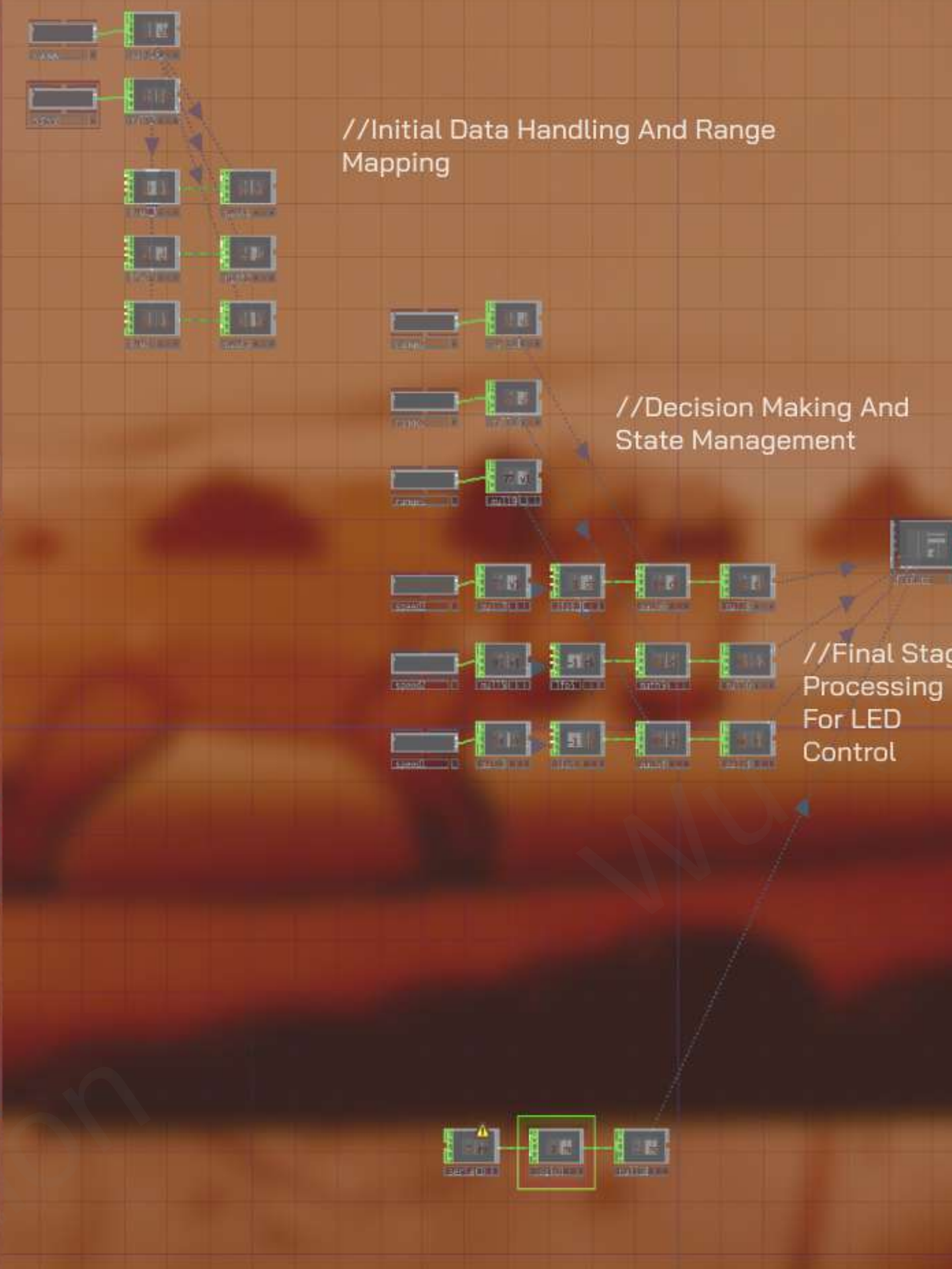
  long duration = pulseIn(echoPin, HIGH);
  long distance = duration * 0.034 / 2;
  return distance;
}

//Calculates Distance Using Time-Of-Flight

void loop() {
  long distance1 = readUltrasonicDistance(trigPin1, echoPin1);
  long distance2 = readUltrasonicDistance(trigPin2, echoPin2);
  long distance3 = readUltrasonicDistance(trigPin3, echoPin3);
  long distance4 = readUltrasonicDistance(trigPin4, echoPin4);
}
```

TouchDesigner

Motion Processing System





Futuristic Diet

Nowadays, many people strictly control the ratio of food in order to pursue the **ultimate healthy diet**. But will the pleasure of eating be lost in this way of eating; what will happen to our way of eating if this trend continues, and will the emergence of new habits be a good thing compared to traditional ones?

In this project, based on the study of the relationship between healthy diets and artificial foods, as well as the judgement of the development trend, **a future concept of food service** is conceived, and it is hoped that this will lead to a reflection on the conflict between the development of future diets and the traditional dietary culture.

Time: 2024.11-2024.12 Type: Individual Project

PHENOMENON

Data Showing People's Demand For Healthy Food

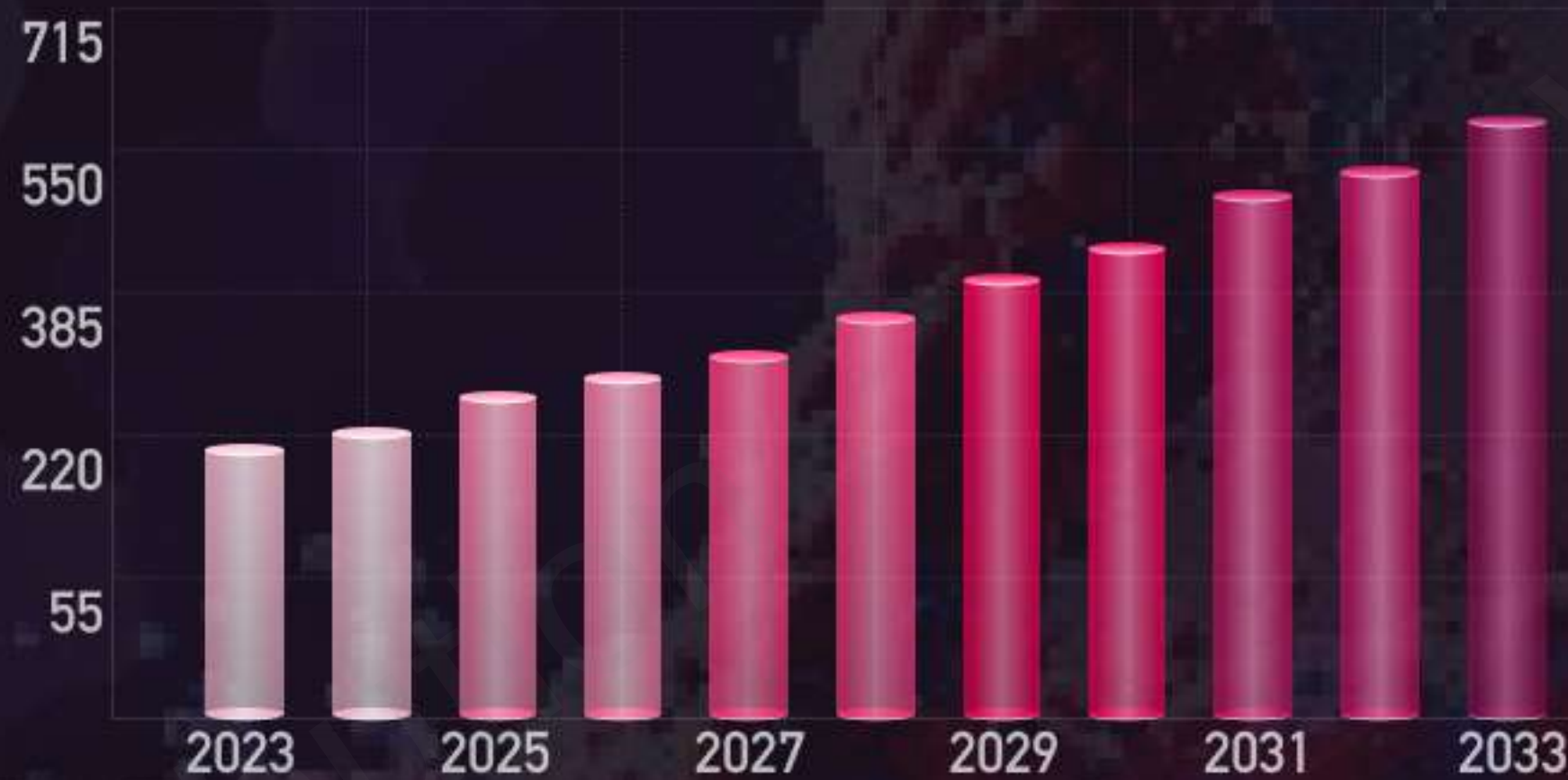
\$ 2315.2 B

The Organic Food Market Is Growing Rapidly Globally. The Global Organic Food And Beverage Market Size Is Expected To Be **\$2315.2 Billion** In 2033

13.9%

With A Compound Annual Growth Rate (CAGR) Of 13.9% From 2024 To 2030, And Revenue Of **\$563.60 Billion** By 2030

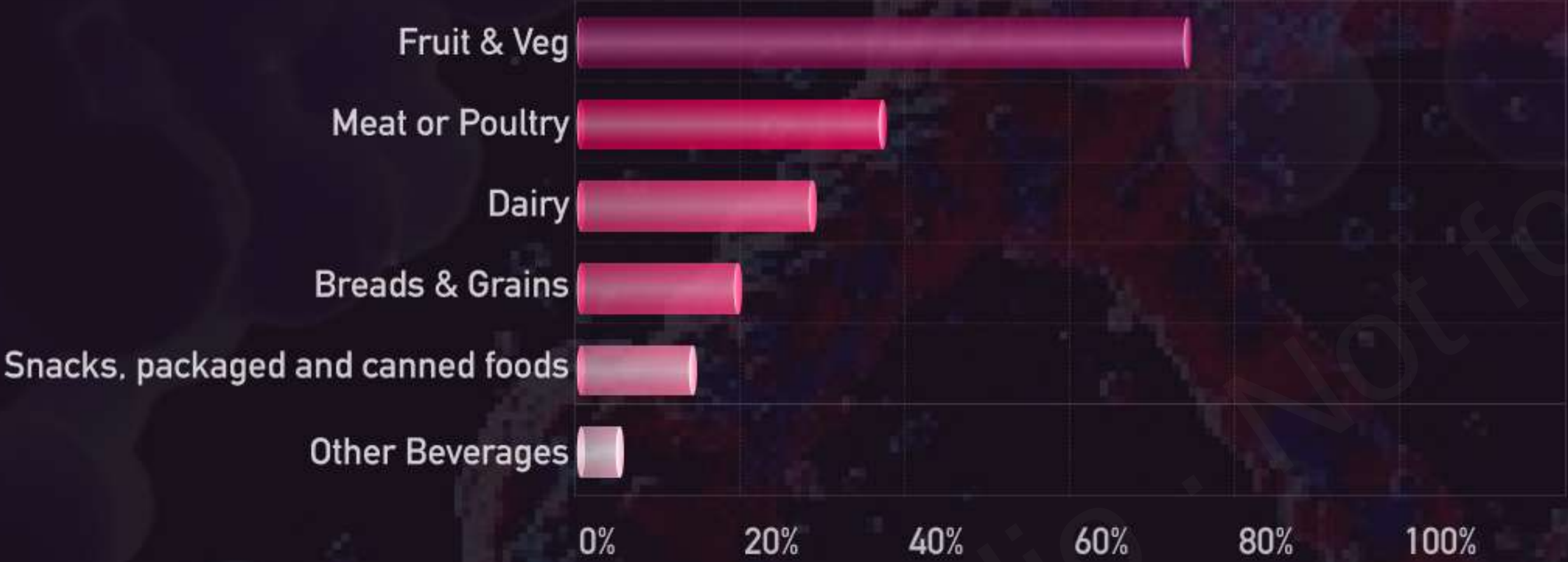
Organic Food Market Size 2023 To 2033 (USD Billion)



Top Weekly Organic Buyers

- 46% Centennials 18-24
- 32% Millennials 25-34
- 25% Xennials 35-44
- 20% Gen X 45-44
- 15% Baby Boomers 55-74
- 10% Matures 75+

Frequency Of Organic Purchasing By Category:



Growth Of Healthy Eating Hashtags On Instagram



Reverse Intermittent Fasting High-Fat Diet Plan

This exemplifies how people adopt extreme dietary plans to achieve ideal health - using ketogenic diets to shift the body into a fat-burning metabolic state

20:00 PM - Appetizer
Avocado salad (1 avocado, olive oil, salt)
Pan-fried bacon (4 slices)

23:00 PM - Snack
Mixed nuts (50g)
Full-fat Greek yogurt (150g)

21:30 PM - Main Course
Pan-seared salmon fillet (200g)
Broccoli scrambled eggs (3 whole eggs)

1:00 AM - Final Meal
Beef burger patty (150g, no bun)
Cheese slices (2 slices), Guacamole

Daily Menu:



Additional Notes:

Total calorie intake controlled between 1800-2200
Macronutrient ratio: **70%** fat, **25%** protein, **5%** carbohydrates
Training scheduled at 7 PM, just before the eating window begins
Follow this plan for 5 days a week, normal three meals allowed on weekend

Eating Window: 20 PM To 2 AM

Fasting Time: 2 AM To 20 PM

Reflection

Does consistently eating similar foods and **suppressing one's desires** contradict the fundamental purpose of eating?

What is the real point of eating, and why do we eat?

Do we pay too much attention to the data and nutrients of food and **ignore the cultural and social value** of food?

Are these specific (High-Fat and low-carbohydrate) diets suitable for all people? How does they **affect long-term health**?

With the popularization of the concept of healthy eating, are we overcomplexing the diet to make it a source of **stress rather than enjoyment**?

ARTIFICIAL FOOD

As health-conscious eating trends grow, artificial food emerges as a potential solution for standardized nutrition and taste. This concept explores how bioengineering could optimize food's nutritional value while maintaining consistent quality

Plant-Based Alternatives

These are made from plant proteins and are designed to mimic the taste, texture, and appearance of animal products. Examples include plant-based burgers (like those from Beyond Meat or Impossible Foods), plant-based dairy alternatives (such as almond milk or soy yogurt), and egg substitutes.

Fermentation-Derived Foods

This category includes products made using microbial fermentation to produce proteins and other components identical to those found in animal products. Examples include Perfect Day's dairy proteins and Clara Foods' egg whites, both created through precision fermentation.

Cultured Meat

Also known as lab-grown or cell-based meat, this involves growing animal cells in a controlled environment to produce meat without the need for animal slaughter. Companies like Memphis Meats and Mosa Meat are pioneers in this field.

Synthetic Biology Foods

This emerging category involves using synthetic biology to create entirely new food products or enhance existing ones. For example, companies are working on producing honey without bees and vanilla flavoring without vanilla plants.

The Advantages And Disadvantages Of Artificial Foods

Advantages

- 🌱

Environmental Efficiency

Production requires less resources compared to traditional farming, with lower greenhouse gas emissions and water usage when measured across the entire supply chain
- 🛡️

Enhanced Food Safety

Controlled production environment significantly reduces contamination risks from pathogens like Salmonella and E. coli, while ensuring consistent quality control
- 🐾

Animal Welfare

Reduces dependency on industrial animal farming, potentially decreasing animal suffering while still meeting protein demands
- 🔬

Nutrition Control

Enables precise control of nutritional content to meet specific dietary requirements and health needs, with potential for customization

Disadvantages

- BR

Agricultural Impact

While production is efficient, large-scale raw material cultivation requires careful management to prevent monoculture farming and protect biodiversity
- PHR

Health Considerations

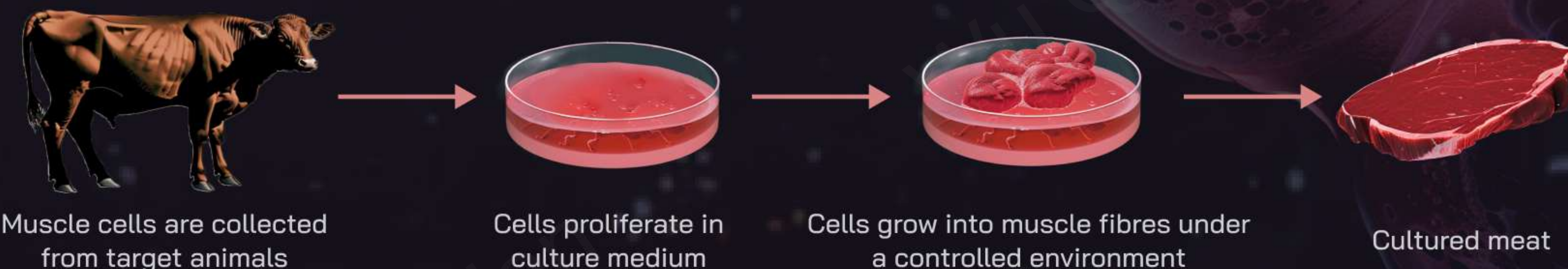
Contains food-grade additives and preservatives that require ongoing research to ensure long-term safety, particularly for those with specific sensitivities
- EC

Ethical Considerations

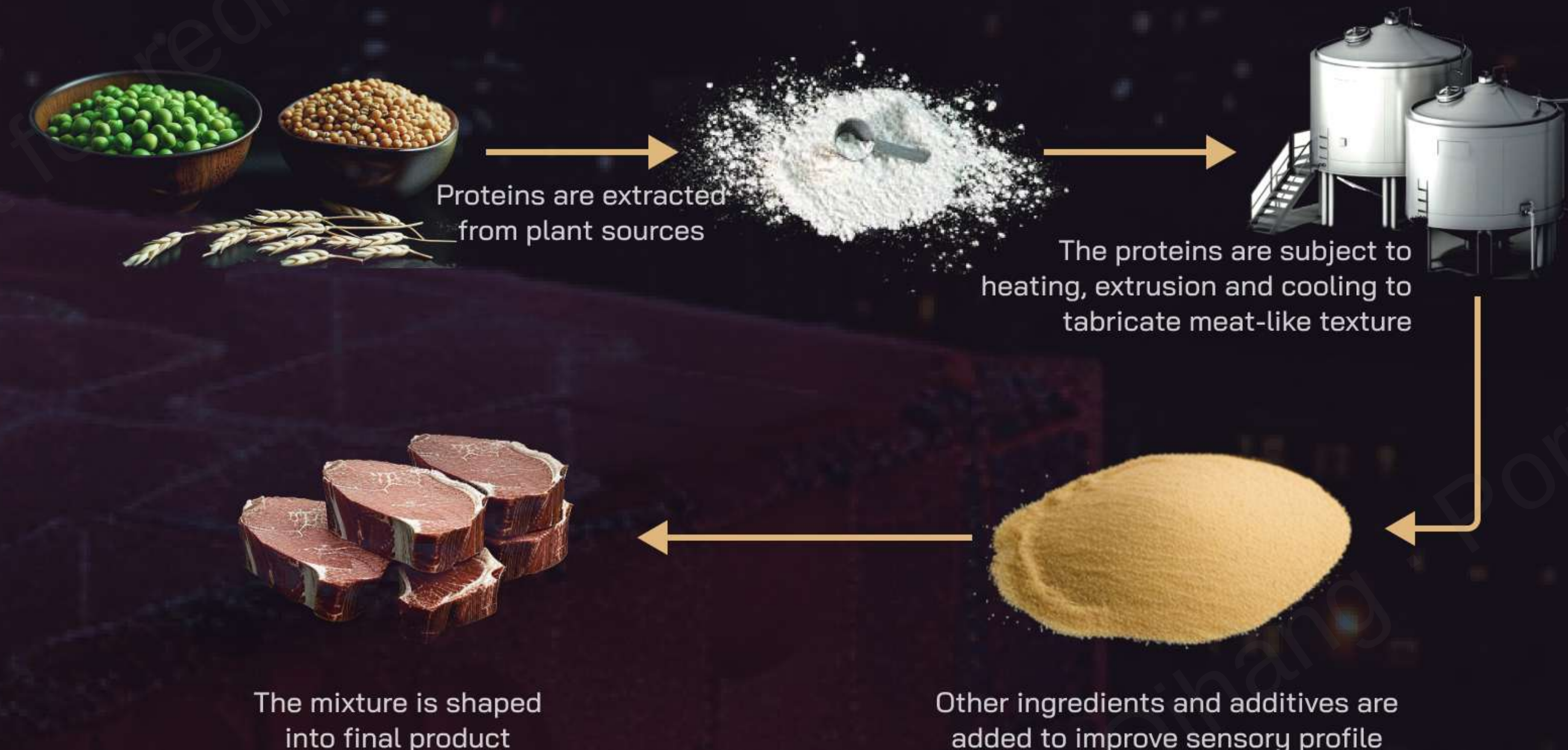
Development process involves complex decisions about genetic engineering and resource allocation, requiring transparent dialogue with stakeholders and public

Manufacturing Principles Of Artificial Foods

Cell Culture Food



Plant-Based Food



Conclusion

Artificial foods, encompassing **genetically engineered, lab-grown, and plant-based products**, offer **sustainability** and **resource efficiency** but **raise health, ethical, and environmental concerns**, requiring further socio-ethical exploration.

Artificial foods are produced through non-traditional agricultural methods, utilizing modern technology and engineering techniques. The primary goal is to address **global food security, environmental protection, and resource scarcity issues**. Will this development lead us to overlook the cultural and emotional values provided by traditional cuisine?

Interview



Age 21 Years Old
Location Shenzhen, China
Career College Student

Interviewee 1

- Q: Would you eat zero-sugar, zero-calorie foods? What are your thoughts on these foods?

A: I drink zero-sugar cola because it's **not as sweet** and it's good for **weight control**. I think if food is meant to bring joy, why eat it if it has no taste? It goes against the purpose of eating.
- Q: Do you think there's a conflict between healthy eating and delicious food? If so, how do you balance them?

A: There's **no conflict**. If you think healthy food is unappetizing, it might be because you're used to greasy and spicy foods. Once you **get used to** healthy eating, it can also be **enjoyable**, like **finding joy in light meals** and different food experiences.
- Q: What are your thoughts on future food trends, like artificial meat and data-driven foods?

A: I'm against **artificial meat for long-term consumption**. Eating natural meat respects the food chain. For example, I enjoy fresh fish cooked on-site at restaurants; it adds excitement and freshness. **Eating should be a relaxing and enjoyable experience**.



Age 32 Years Old
Location Hangzhou, China
Career Designer

Interviewee 2

- Q: Have you tried any special diets (e.g., keto, intermittent fasting, vegetarian)? How effective were they?

A: I just **switched to lighter dinners**, reducing high-calorie foods like rice and noodles, and replacing them with low-calorie, filling foods.
- Q: Have you ever felt stressed or anxious due to diet management? How did you cope?

A: Yes, I felt **anxious** because my previous unhealthy diet led to **obesity**, and I was **mocked by others**. After that, I decided to control my diet and **exercise** simultaneously.
- Q: What are your thoughts on future food trends, like artificial meat and data-driven foods?

A: I am **hesitant to try these foods**. I believe that every existing natural food has its own significance, **containing not only known nutrients** but possibly **essential trace elements** that we haven't yet discovered. **Artificial foods might overlook these unknown elements, leading to nutrient deficiencies**.

Conclusion

Most people prioritize **enjoying food** over maintaining a specific body image. Their main **motivation** for diet management is **weight loss**, but they struggle with the blandness of healthy foods, which **affects their mood**. Overall, they are **skeptical** about artificial foods, fearing they may lack essential nutrients found in natural foods.

CASE STUDY

All Dishes Are Converted To Data Food "CUBE"

TOKYO -- Humans have succeeded in sending people and animals into space. Japanese companies are now putting their minds together to see if they can instantly "teleport" gourmet food to the heavens and other faraway places.



[CUBE] is developed by OPENMEALS, which decomposes the elements that make up the world's first digital format cooking of data meals and consists of a 3 cm cupe shape.

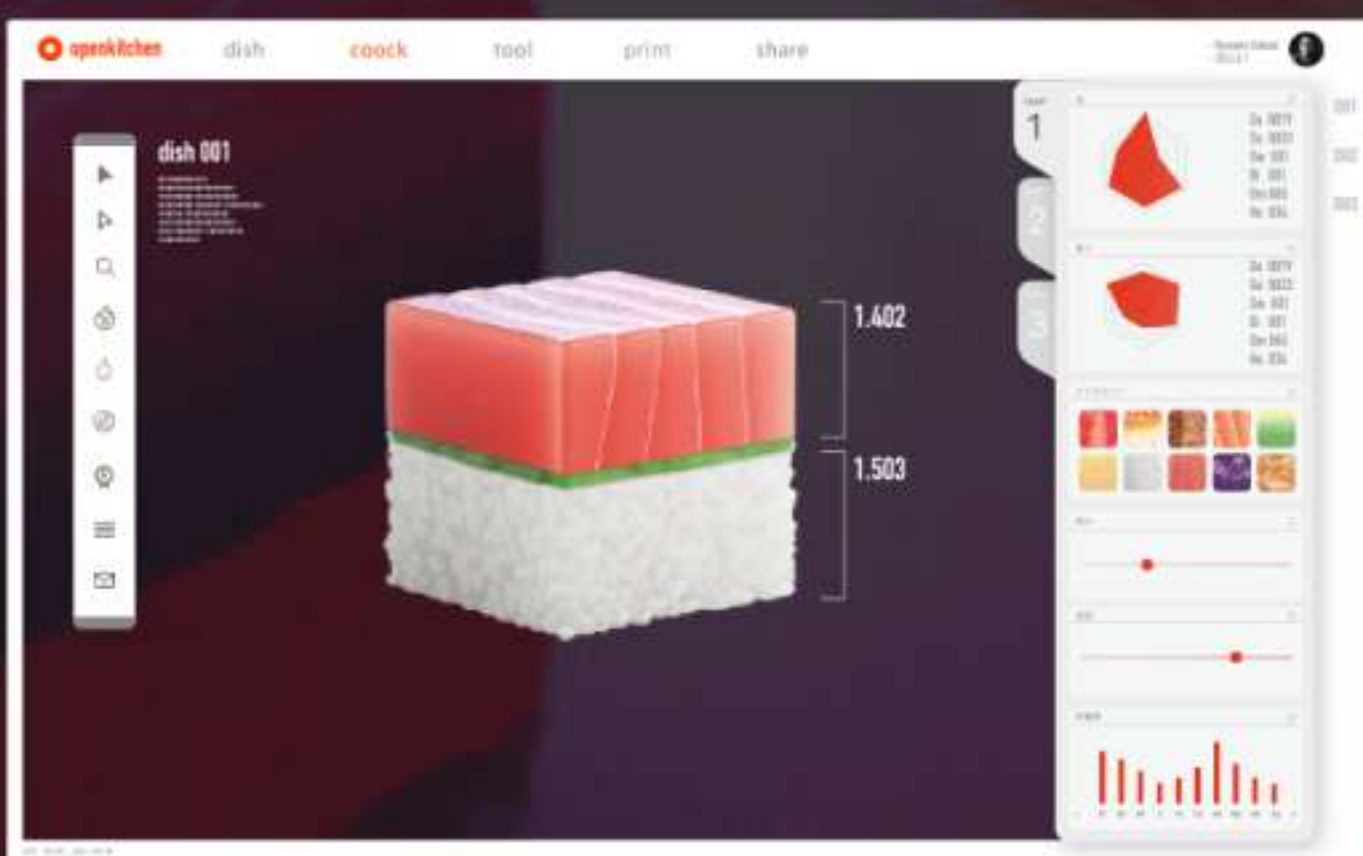
1 texture, 2 flavors, 3 fragrances, 4 elasticity, 5 temperature, 6 layers, 7 tax order, 8 ratio, 9 layers method

With an algorithm based on these 9 elements, it is possible to convert various dishes into data meals.

They are developing a special system that can design "CUBT" data food.

Cooking is made on a laptop. Such a future will be realized.

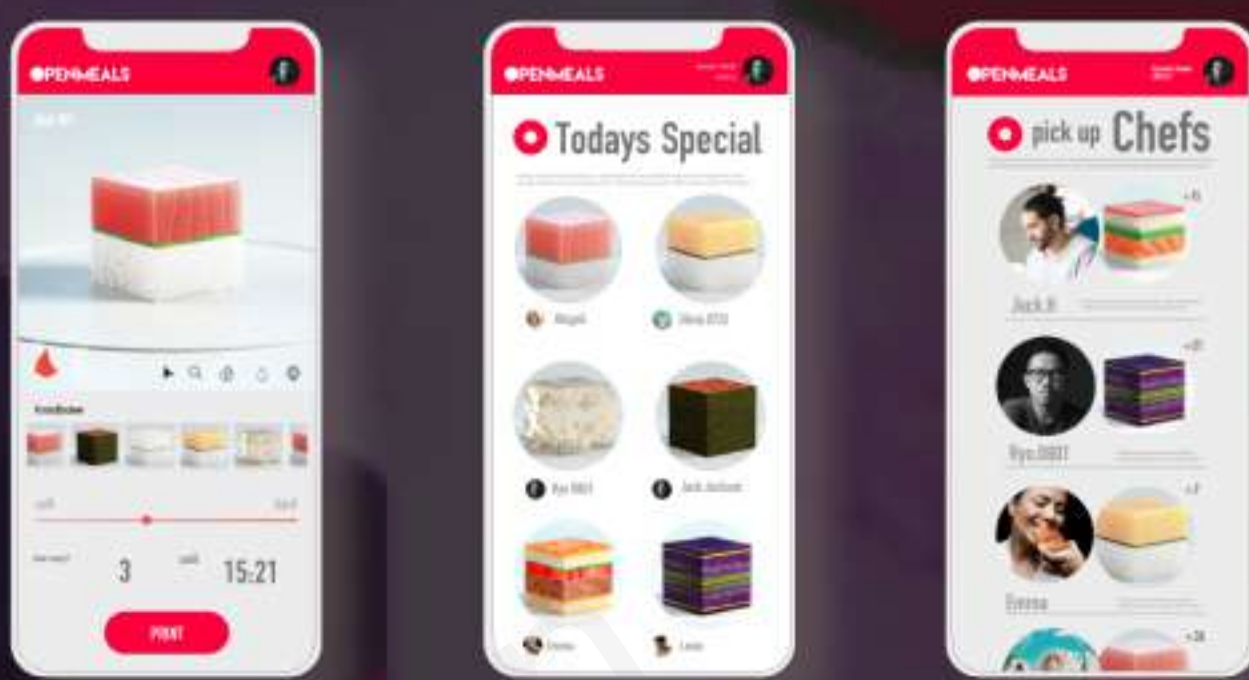
The designed data is recorded in [cube] format.



They are developing a special 3D food printer for outputting data food CUBE. They have multiple new mechanisms that have not been able to realize any 3D food printer so far. With this printer, data meals designed on a laptop will be eaten as real dishes.

A digital platform where "cooking CUBE" designed by data food creators from all over the world gather. Anyone can easily download data food from their smartphone.

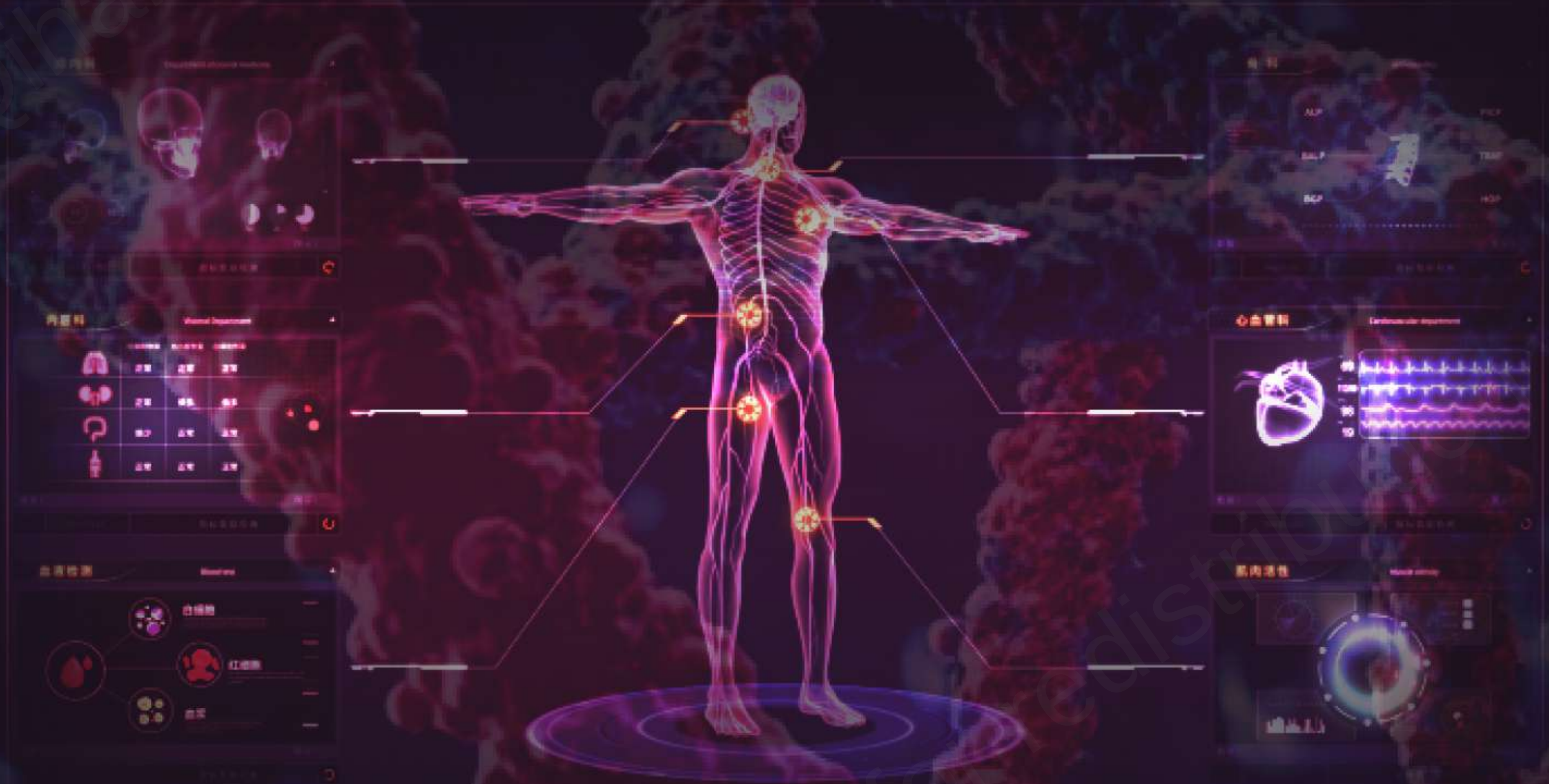
They are developing an attractive UI that allows you to choose dishes from "Today's Recommendation" and "Popular Chef Ranking".



To the era of sharing food with data. Share your food with data like exchanging photos and videos. Such a Social Food Network Service will be born soon.

FUTURE SCENARIO

Based on the current trend towards standardised, ultra-healthy diets, I have made the following vision of a possible future scenario:



1. Smart Entry Experience

- **Sensorless scanning technology**, no need for guests to linger
- **Biometric identification system**, automatically retrieve the customer's historical data
- The equipment detects the **missing nutrients in the human body**, and the results are fed back to the system backstage.



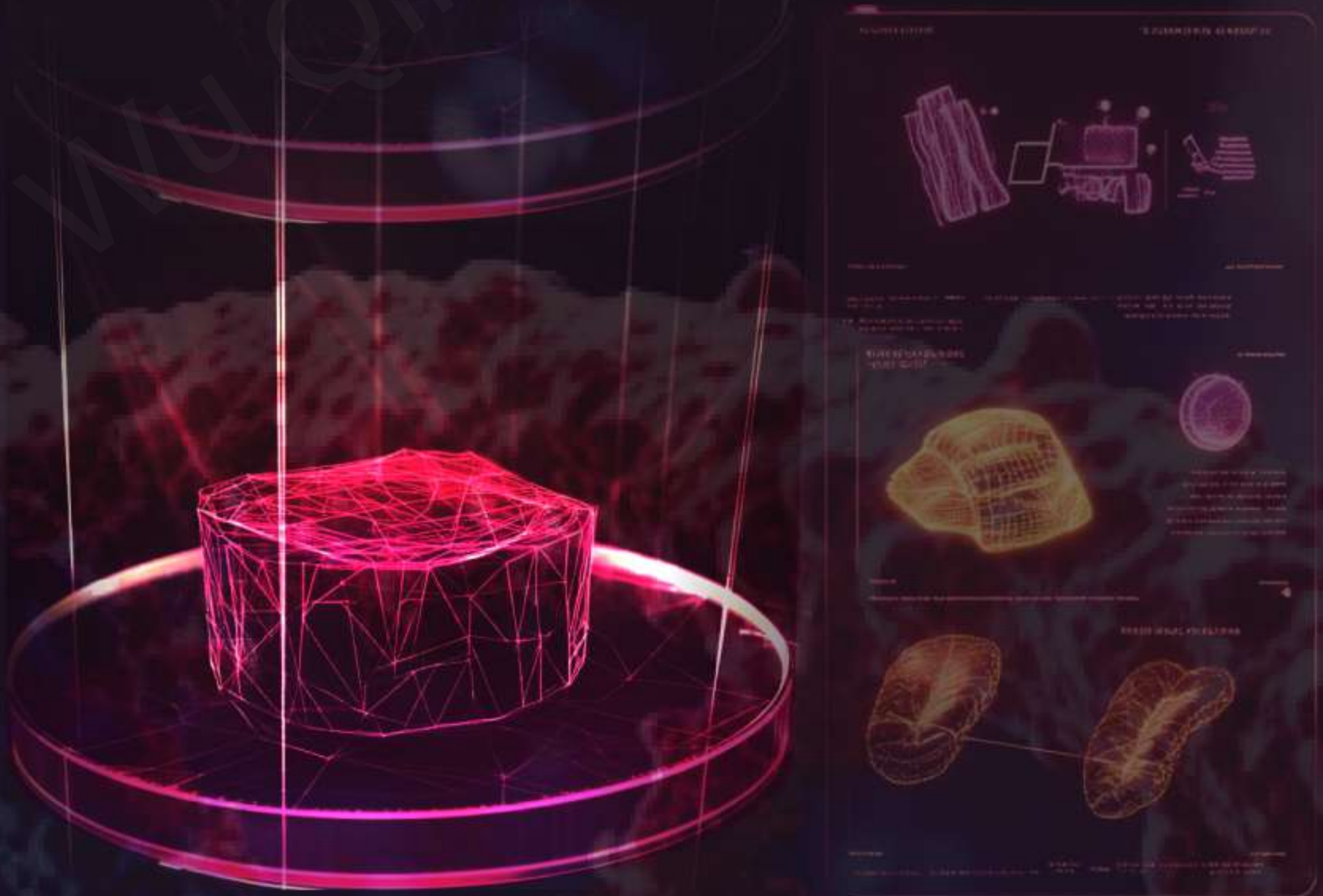
2. Nutritional Information Display

- The smart table is equipped with a **transparent touch screen**, which can visually display a **3D preview of the food**.
- Nutritional details, including calorie count, vitamins, and nutrients, are displayed alongside the 3D model for **real-time user insight**.



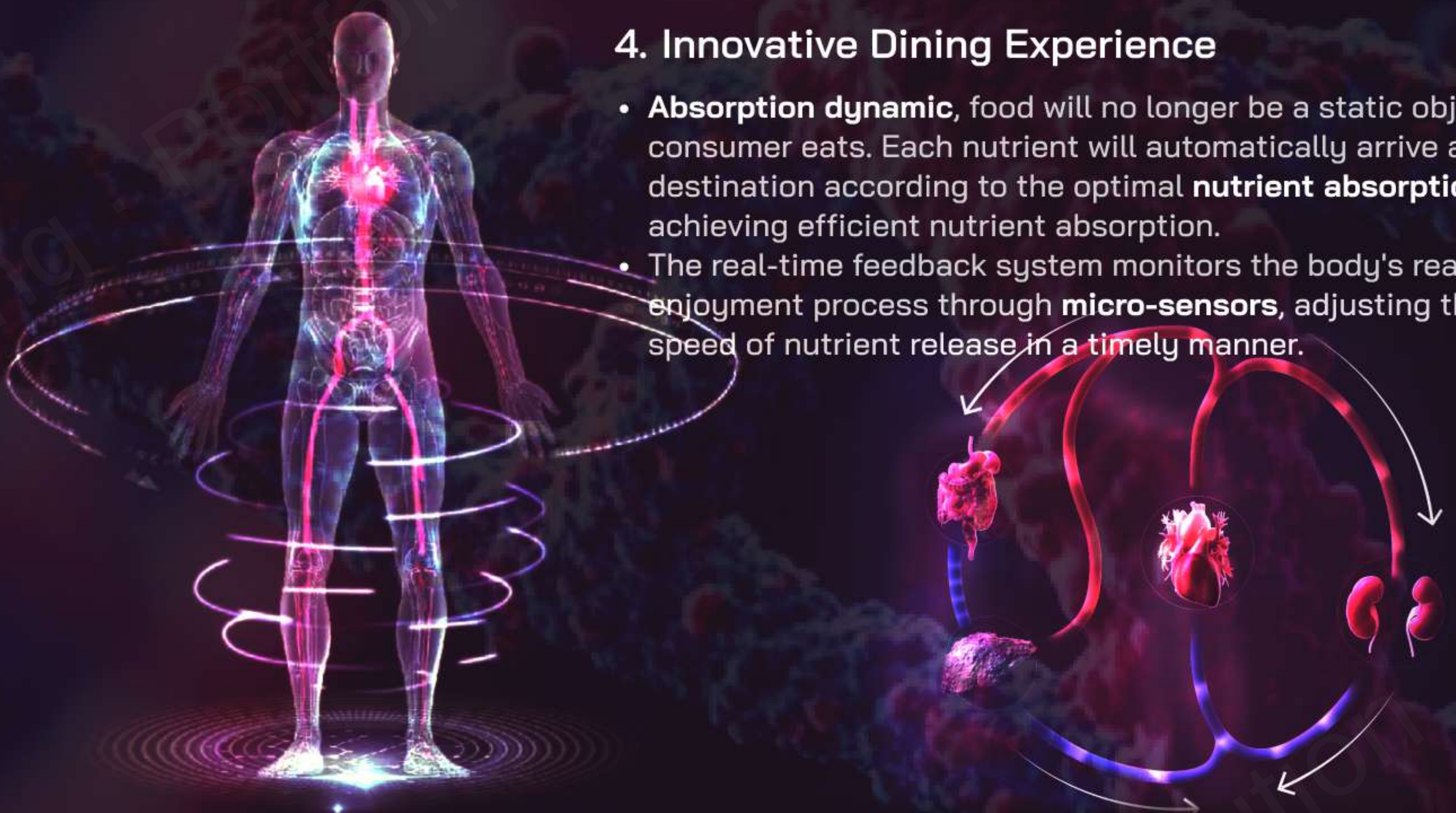
3. Intelligent Food Preparation Process

- The system combines previously required nutrients with **molecular gastronomy** and **3D printing technology** to achieve multi-layered flavours.
- **Real-time adjustment** of food parameters, including nutrient density, flavour levels, release rate, absorption efficiency.



4. Innovative Dining Experience

- **Absorption dynamic**, food will no longer be a static object. After the consumer eats. Each nutrient will automatically arrive at the optimal destination according to the optimal **nutrient absorption path**, thus achieving efficient nutrient absorption.
- The real-time feedback system monitors the body's reaction during the enjoyment process through **micro-sensors**, adjusting the taste and the speed of nutrient release in a timely manner.

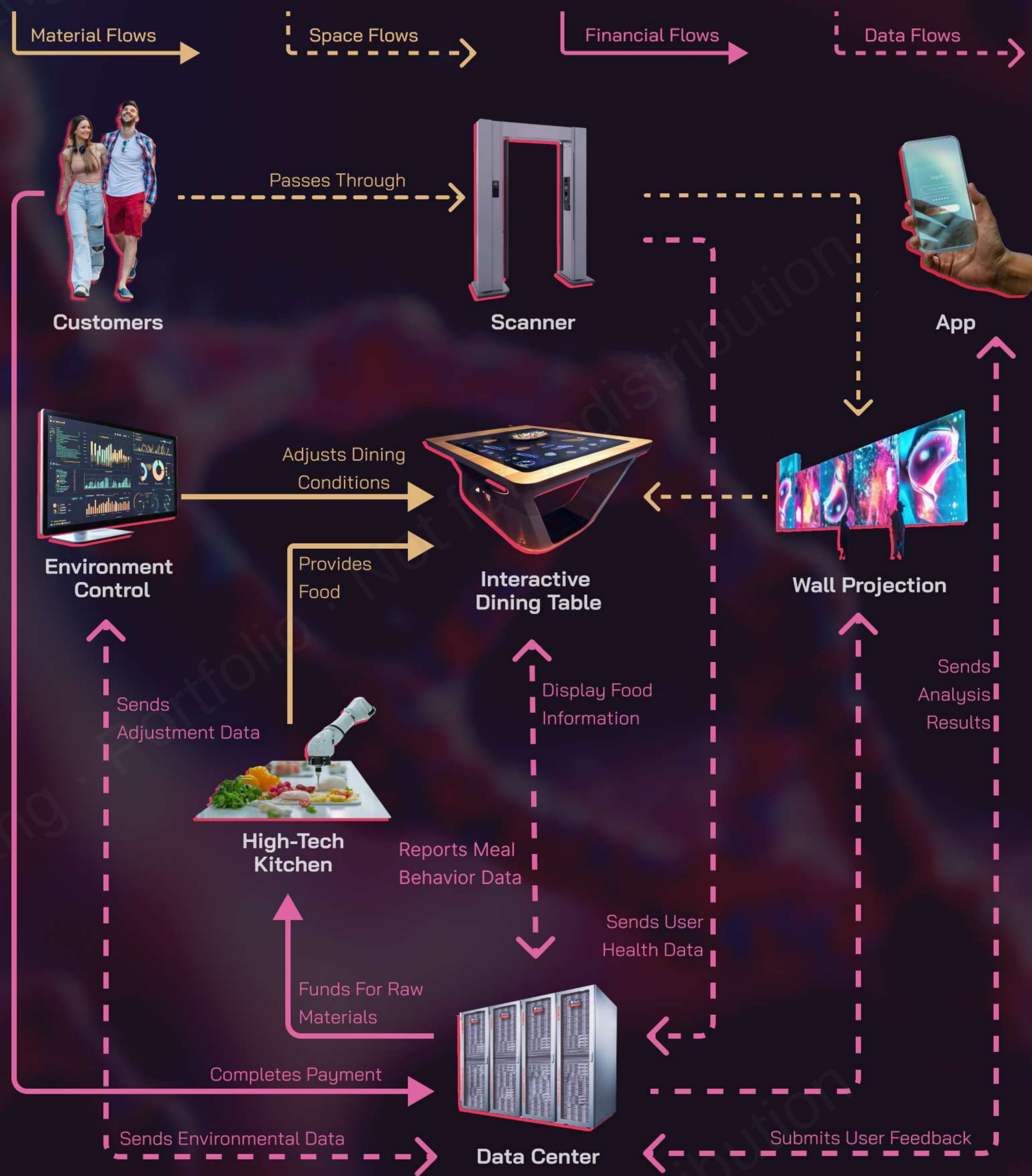


5. Post-Dining Service Optimization

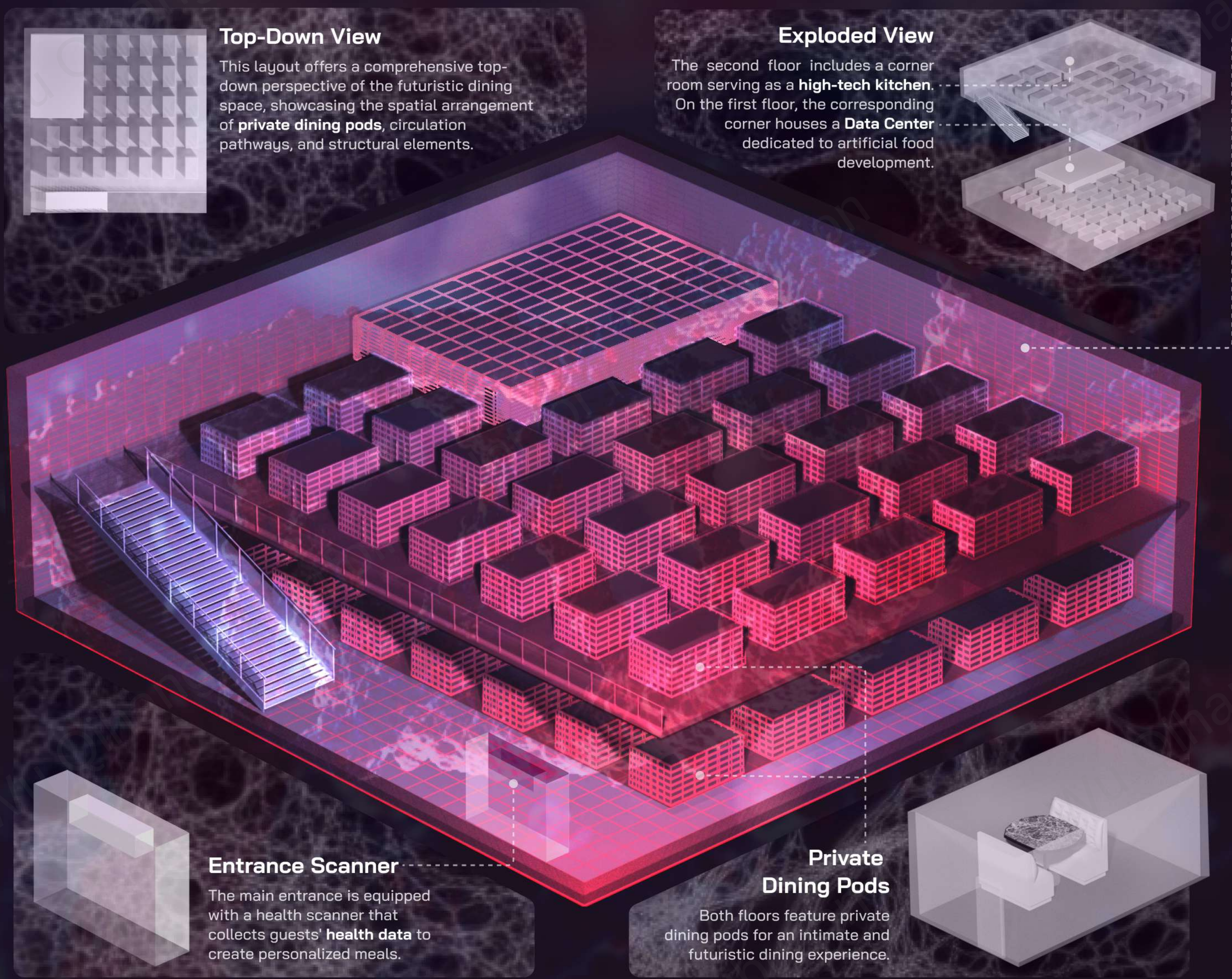
- Create **personalised nutritional profile** cloud database
- Provide **intelligent suggestions** for the next meal optimisation plan, daily dietary matching suggestions, exercise suggestions and lifestyle adjustment suggestions.
- Provide continuous **nutritional tracking and advice** through mobile APP to establish a **complete data chain of meal-absorption-feedback**.



SERVICE SYSTEM MAP

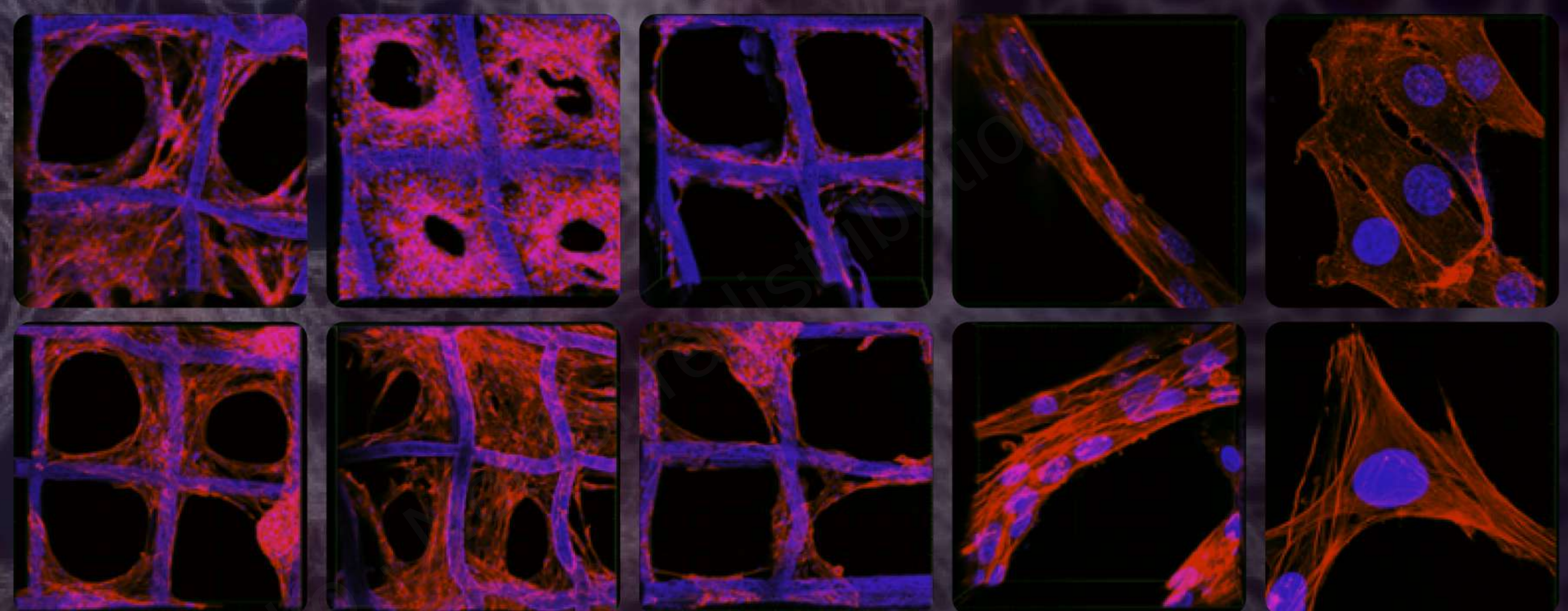


THE FUTURE FOOD HUB



Visualizing The Future Of Food

The walls of this space bring the future of food to life by showcasing the process of artificial food production through two key aspects: cell growth and raw materials, offering an **immersive and educational** experience. This section highlights the **microscopic cell growth process** behind artificial food. Fluorescent images show blue nuclei and red cytoskeletons, illustrating how muscle and bone cells develop on protein scaffolds.



Future Meal Box: Customized Nutrition

The Future Meal Box is a revolutionary solution, offering **customizable portion sizes** and nutritional compositions tailored to individual dietary needs.

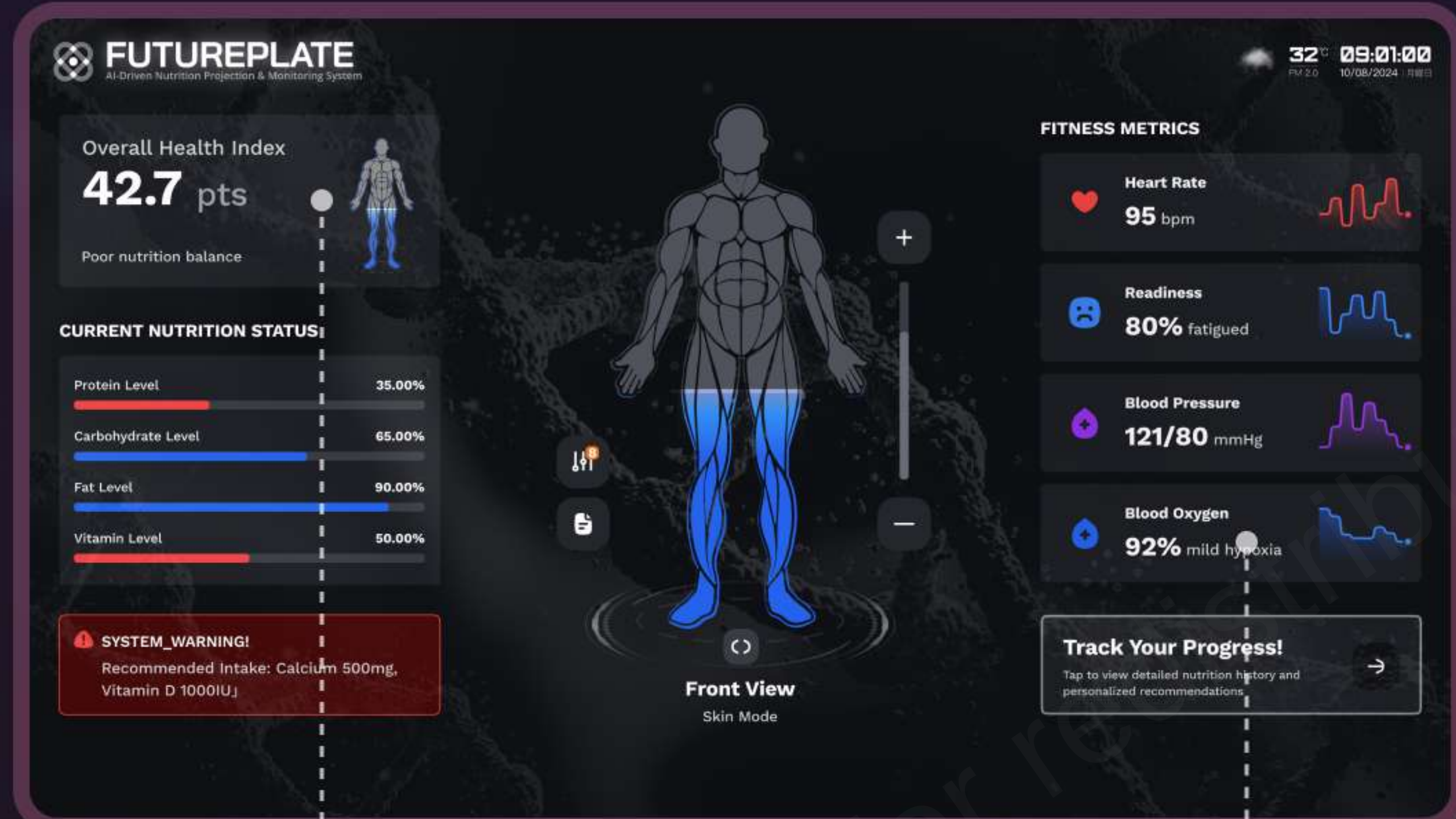
Artificial Ingredients & Food Forms

The top row showcases artificial materials such as **powders, pellets, and protein blocks**. The bottom row presents transformed food forms, including textured cubes, meat-like blocks, and nutrient gels, designed for balanced and **sustainable nutrition**.



INTERACTIVE DINING TABLE SYSTEM

Core Interface Insights



Displays real-time health metrics, visualized through the **human body model** and **live data** updates

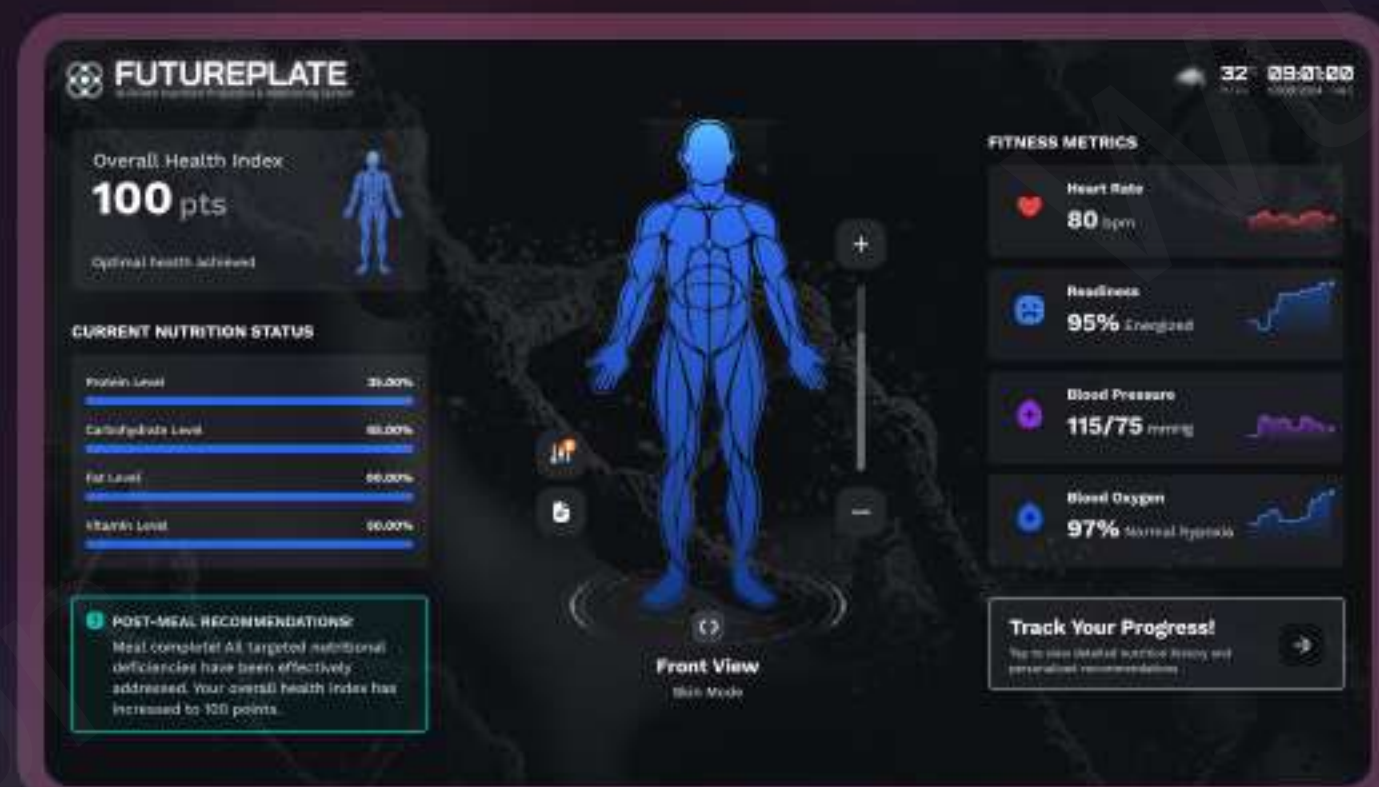
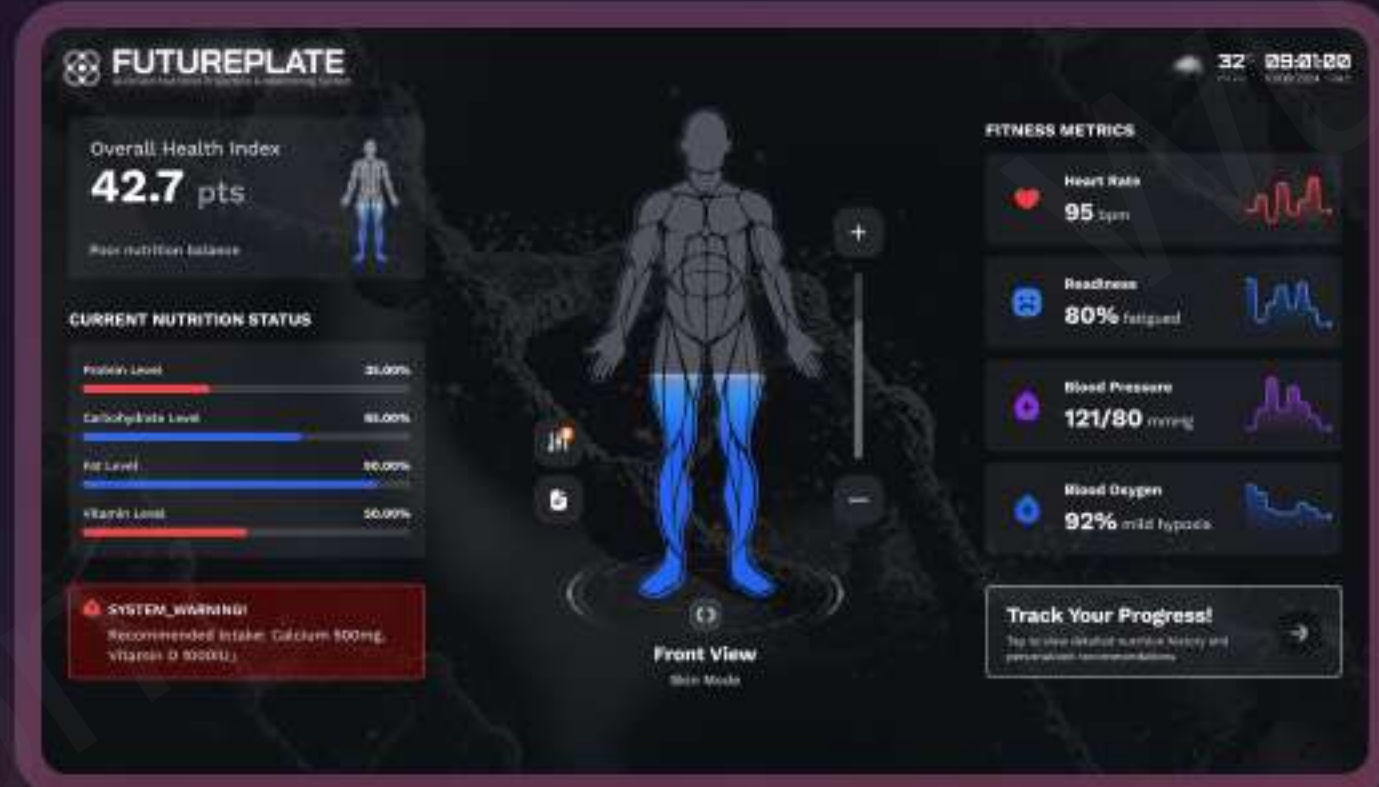
Presents key health indicators with **trend lines**, providing insights into the user's current health status



Show the **status** of each **nutritional component** in the body. **Red** indicates critical **warning** levels

The system **customizes nutrient supplements** based on individual health data, with each supplement assigned a unique code

Meal Journey Visualization



Upon Seating

The system displays data on the interactive dining table interface based on the **scanned results** upon the customer's arrival.

Post-Serving Nutrient Display

Dynamically showcases the provided nutritional content **after serving the meal**.

Mid-Meal Update

Nutritional replenishment is tracked, with **real-time updates to body data**. Progress bars and metrics reflect changes dynamically.

Post-Meal Analysis

Comprehensive analysis after the meal, highlighting optimal **improvements** across all body health metrics.

USER MOBILE INTERFACE DESIGN

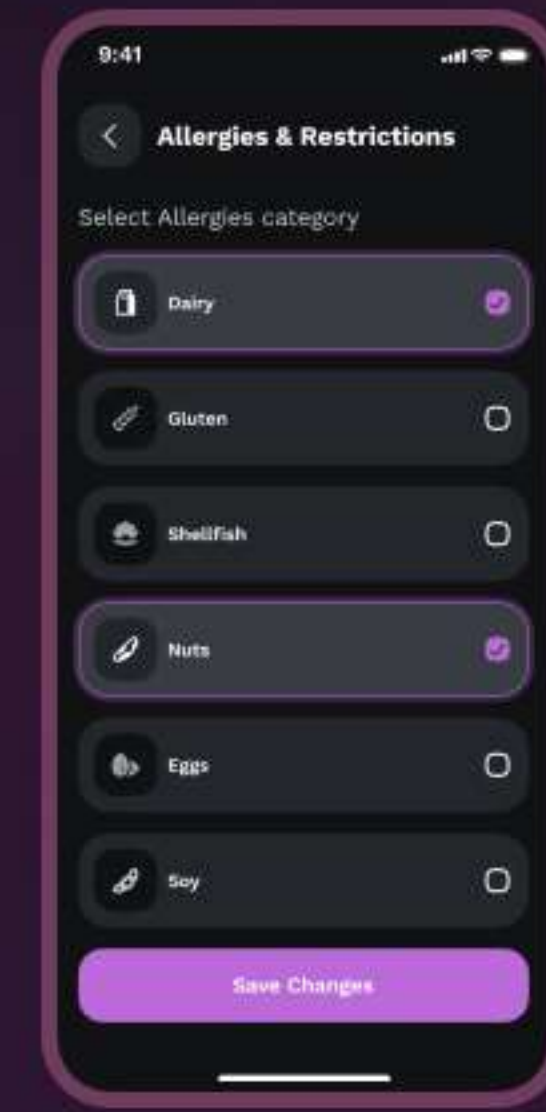
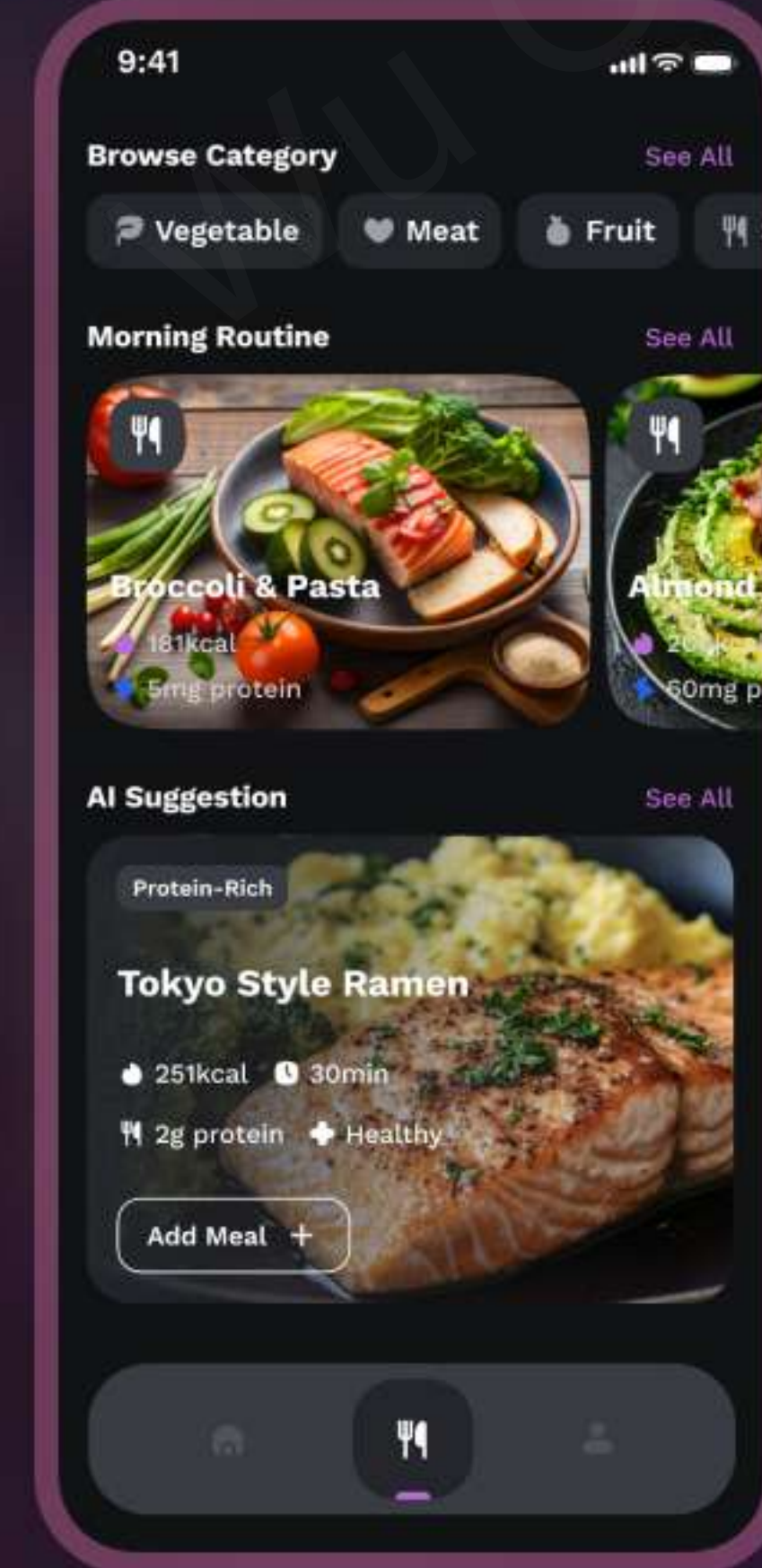
Health Dashboard

Gain a quick overview of your health metrics, nutrition trends, and progress, all in one place.



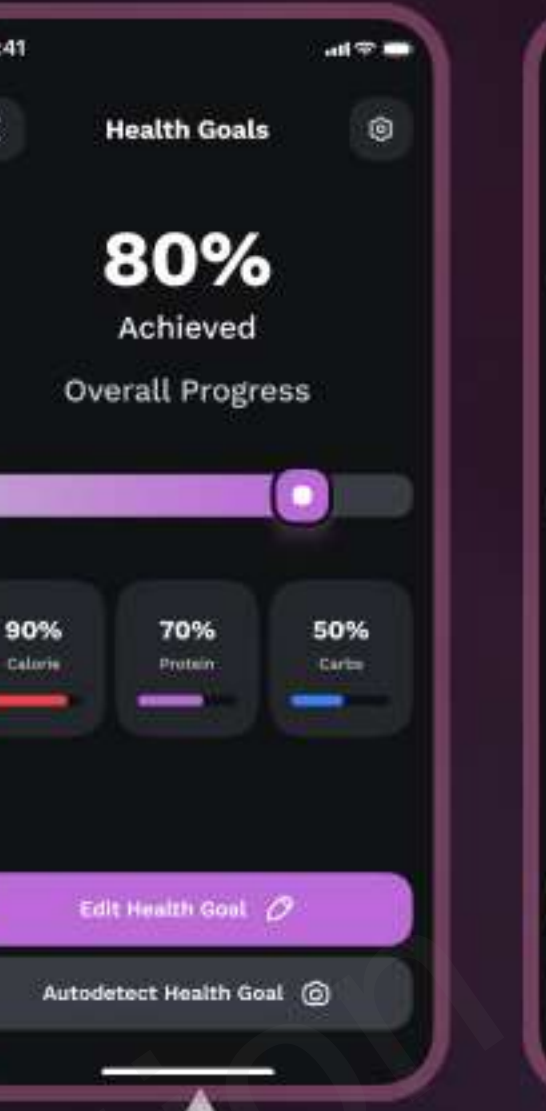
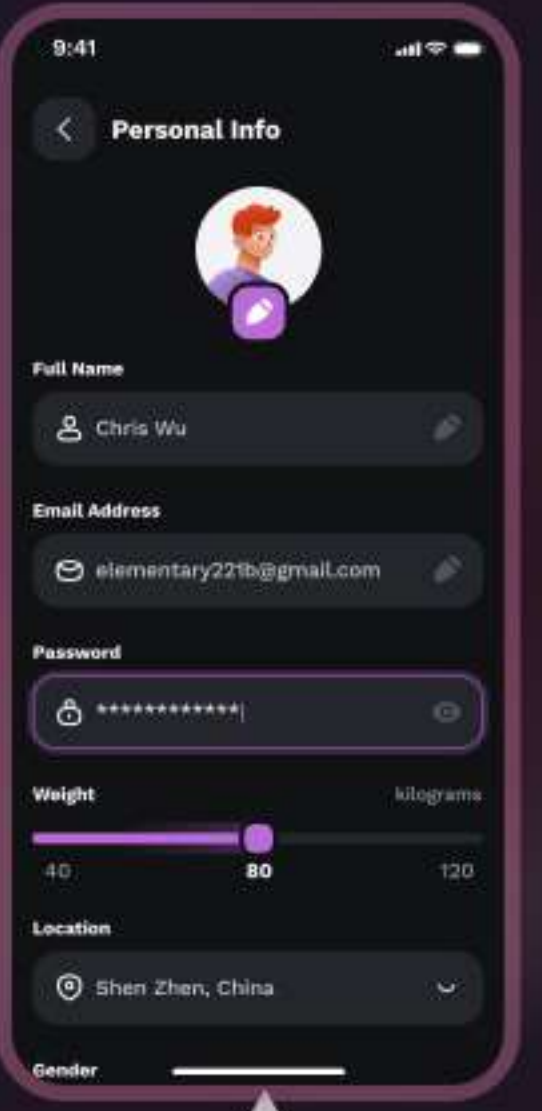
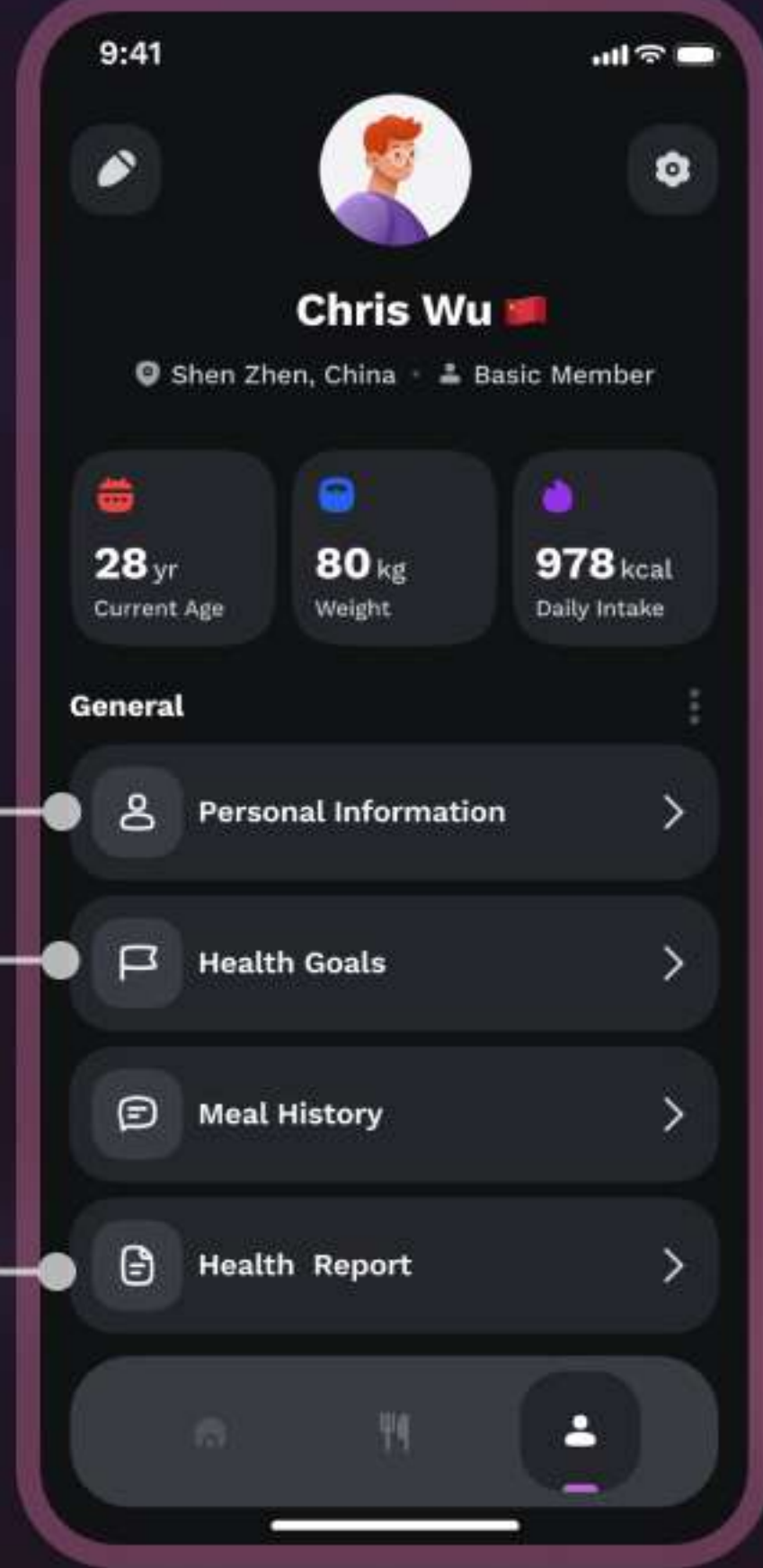
Meal & Nutrition Insights

Explore personalized meal suggestions, track dietary habits, and analyze nutrient intake. Plan your nutrition smartly with advanced tracking tools.



Profile & Objectives

Manage personal details, set health goals, and review in-depth reports. Stay motivated with tailored recommendations and insights into your progress.



USER FEEDBACK

"The precision in monitoring is impressive, but it raises ethical concerns. How can we ensure data privacy when our health metrics are so exposed?" – User A, Student

"The system offers an unparalleled understanding of my body's nutritional needs, but it makes me wonder—will such dependence on technology erode our ability to trust our instincts?" – User B, Fitness Enthusiast

"It's incredible how interactive dining can enhance health awareness. However, does this shift the responsibility of health entirely to technology?" – User C, Health Coach

"It's inspiring to see nutrition tailored to the individual, but what about the social aspect of meals? Will this kind of dining make eating feel isolating?" – User D, Teacher

Phoenix

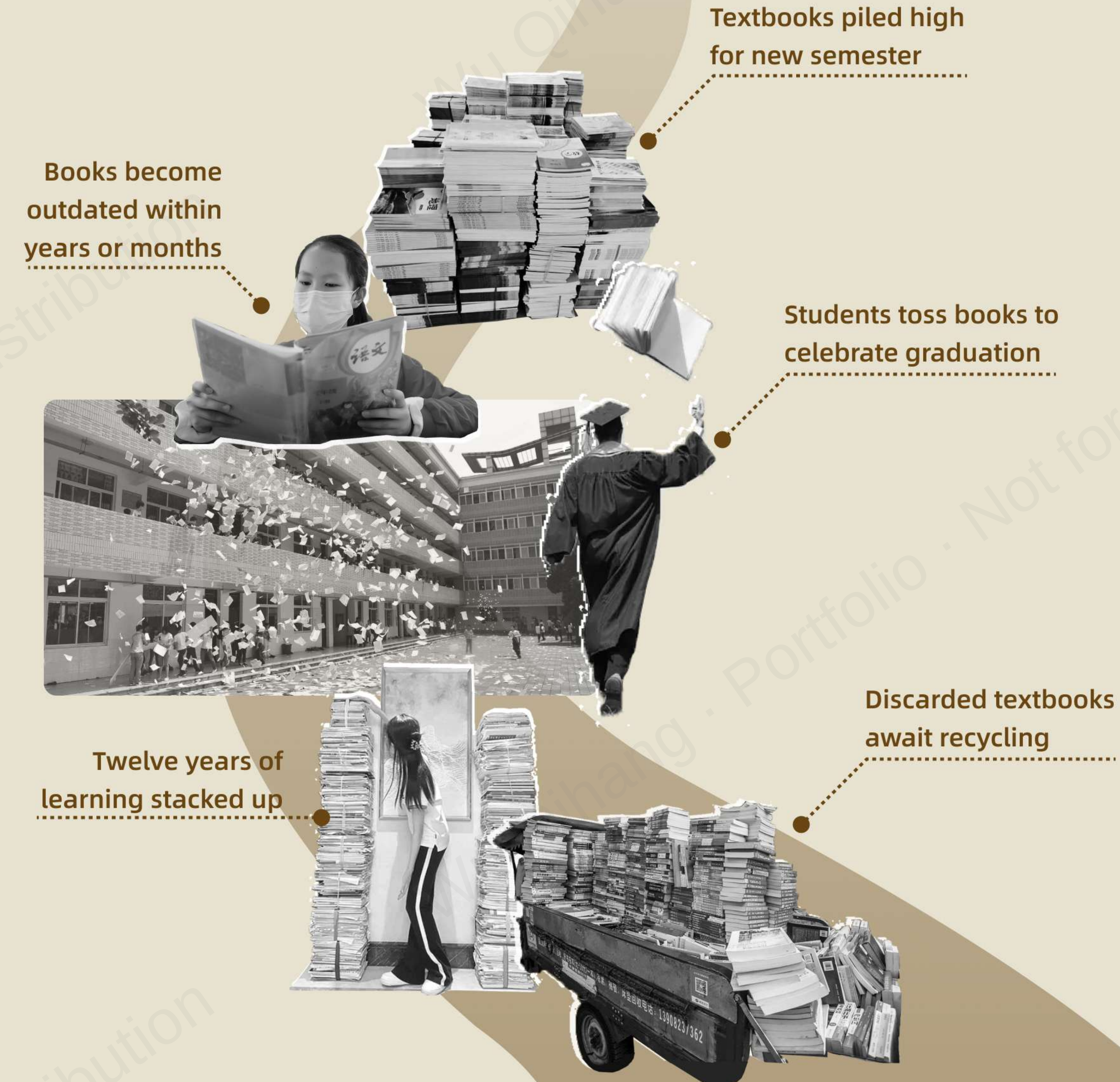
Textbook waste in China is a significant issue, with **over 2.9 billion** textbooks sold annually, often discarded or recycled after minimal use. This leads to severe resource wastage, as students treat textbook disposal as part of celebratory traditions.

Phoenix introduces a creative and sustainable solution by **repurposing discarded textbooks into functional items**. This approach not only reduces waste but also creates a **tangible connection** to students' educational journeys, promoting sustainability and environmental protection.

Time: 2024.01-2024.03 Type: Individual Project

1 Background

The Life Cycle Of Textbooks In China



Why Do Textbooks Have Such A Short Life Cycle



The Value of Education

Parents prioritize education and invest heavily in their children's learning, including purchasing new textbooks each semester



Economics of Textbook Production

China's large-scale textbook production enables low costs, with prices ranging from 20-50 RMB per book.



Short Lifespan and Rapid Turnover

Typically one semester per book. Rapid curriculum updates lead to quick obsolescence, limiting the potential for reuse or resale.



Limited recycling options

Content updates restrict second-hand markets, forcing most outdated textbooks into paper recycling streams



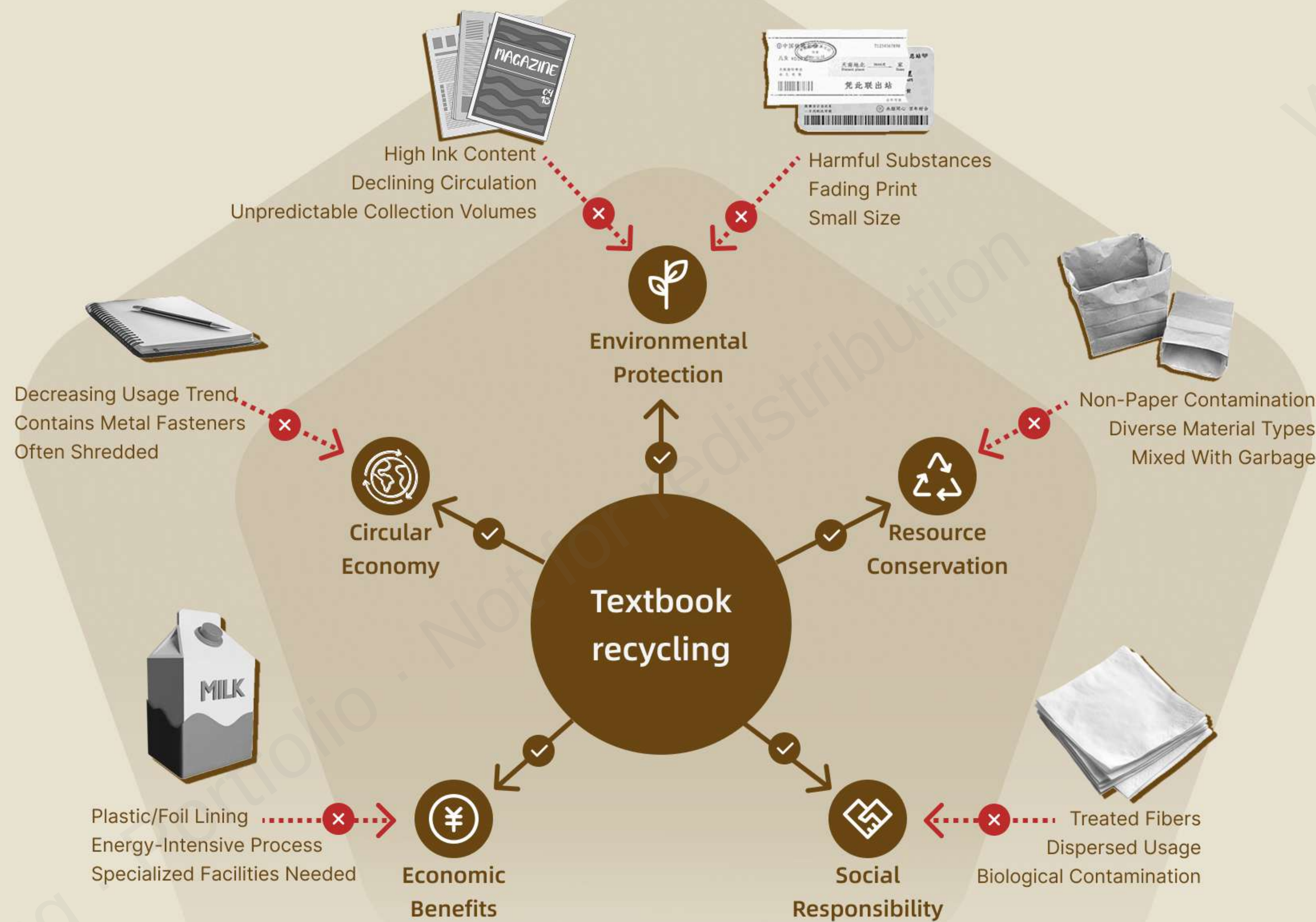
Impact of textbook diversity

Multiple textbook options per subject increase production volume and eventual waste generation

Is it possible to develop a service system that enhances the circular value of textbooks?

2 Research

Mainstream Paper Materials Recycling Comparison



Why Textbook Recycling Has the Highest Value Among Printed Materials

Conclusion

After analyzing various types of printed materials, textbook recycling demonstrates the highest value because:

Low Digitalization Rate

- Learning tools still heavily rely on physical formats
- Continuous high demand for paper textbooks

Limited Second-hand Value

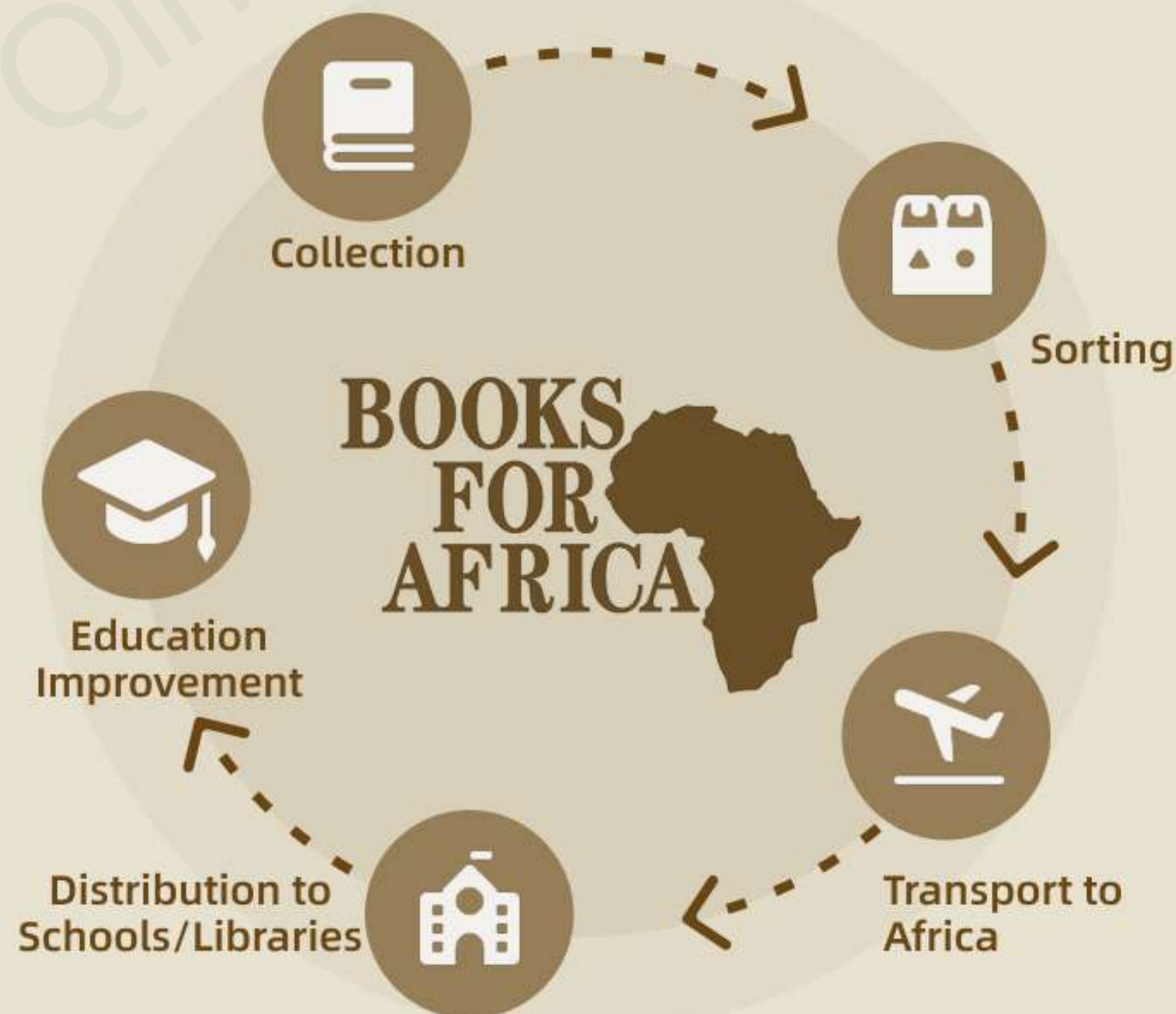
- Textbooks have restricted resale potential
- Recycling remains the primary disposal method

Predictable Accumulation

- Higher recycling value than promotional materials
- Fixed preservation and collection periods

3 Case Study

Existing Model: Lessons From Books For Africa



Books for Africa was founded in 1988 with its headquarters located in Atlanta, US. The organization's mission is to **improve and promote education and reading culture** in Africa by donating books to schools, libraries, and other educational institutions in various African countries. Since its establishment, Books for Africa has donated millions of books to various African countries and has become one of the world's largest non-profit book charities.

What if we create a textbook recycling system for 3-5 years of circular use?

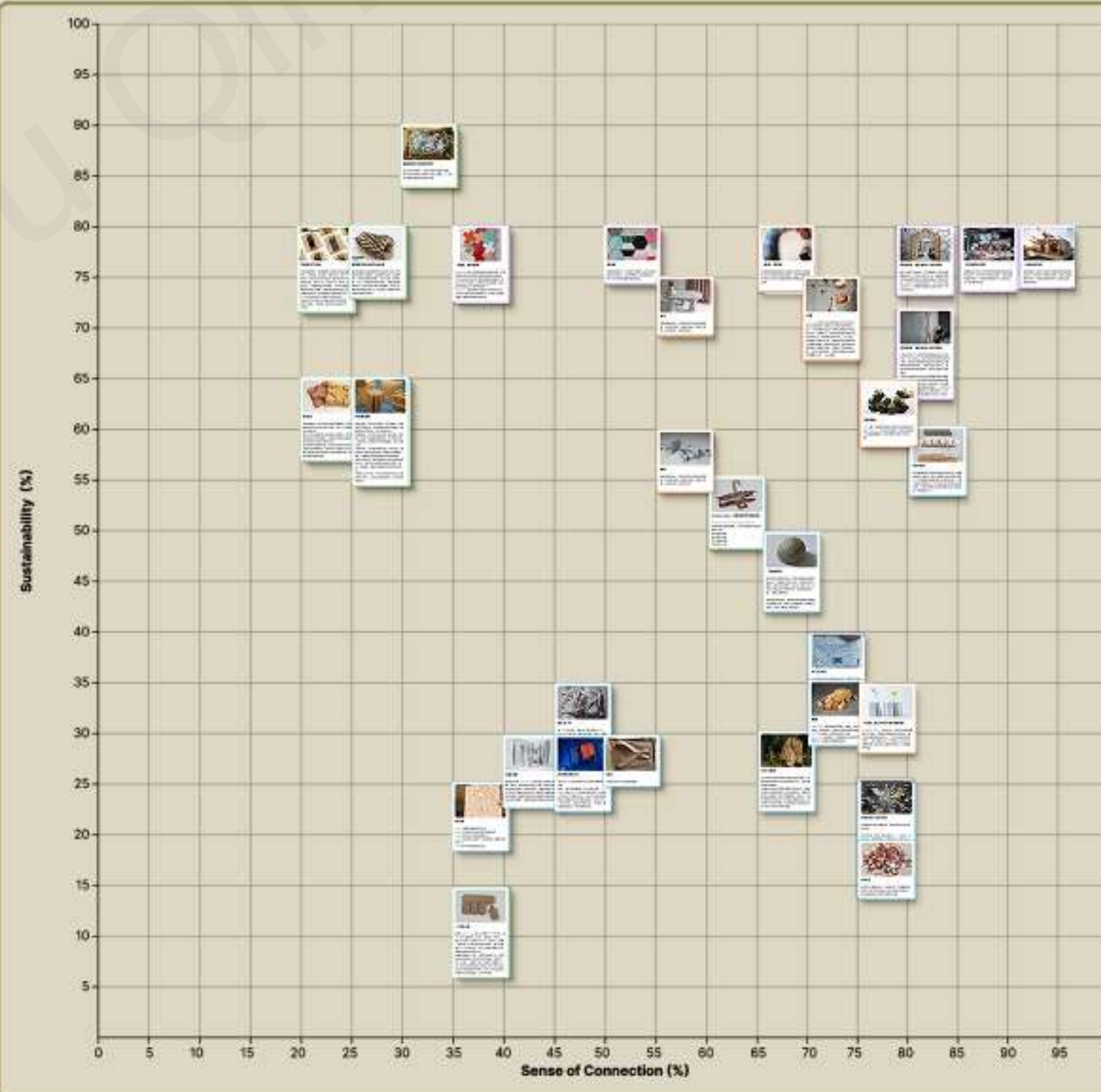
Donator
Individuals give their books, fueling knowledge transfer across continents

African student
Learners expand their educational horizons through donated books

Volunteer
Dedicated helpers sort, pack, and prepare books for their African journey

Cooperative partner
Organizations facilitate book distribution, bridging gaps in education systems

Case Inspiration: The Use Of Second-Hand Paper Products



Analyzing **Sustainability (%)** on the Y-axis and **Sense of Connection (%)** on the X-axis reveals that products like **craft items, stationery, and packaging** are ideal for recycled paper. These items not only promote sustainability through the circular use of paper but also maintain a meaningful connection with users by serving practical or aesthetic purposes, making them excellent options for circular paper use.

What if produce a variety of recycled paper products?



Comparative Analysis Of Recycling Solutions

Comparing the Effects of Reuse, Recycling and Direct Landfill Disposal Base Unit Specifications:

Batch quantity: **1000 books**
Weight per book: **0.5kg**

Total weight: **0.5 tons**
Calculation period: **5 years**

Among the three recycling solutions, Pulp Recycling demonstrates the lowest carbon footprint (-850 kg CO₂e), making it the most eco-friendly option.

Recycling Solutions (5-Year End)



Carbon Emission Comparison of Recycling Processes



Total Carbon Emission



Conclusion: Based on the calculation results, it is clear that **Pulp Recycling** is the most environmentally friendly option compared to the other two methods.

Emotional Value In Textbooks: Duozhua Yu



Founded in 2017, Duozhua Yu is an engaging second-hand book trading platform with the core concept of **"bringing dormant books to life."** It goes beyond simple buying and selling, emphasizing the **stories and emotional value** behind each book. **What Functions Create Emotional Connections?**



Sharing Book Stories

- Sellers can share personal stories or reflections related to the books they sell.
- Buyers can discover the thoughts of the previous owner, forming a **cross-time connection**.

Describing Book Conditions

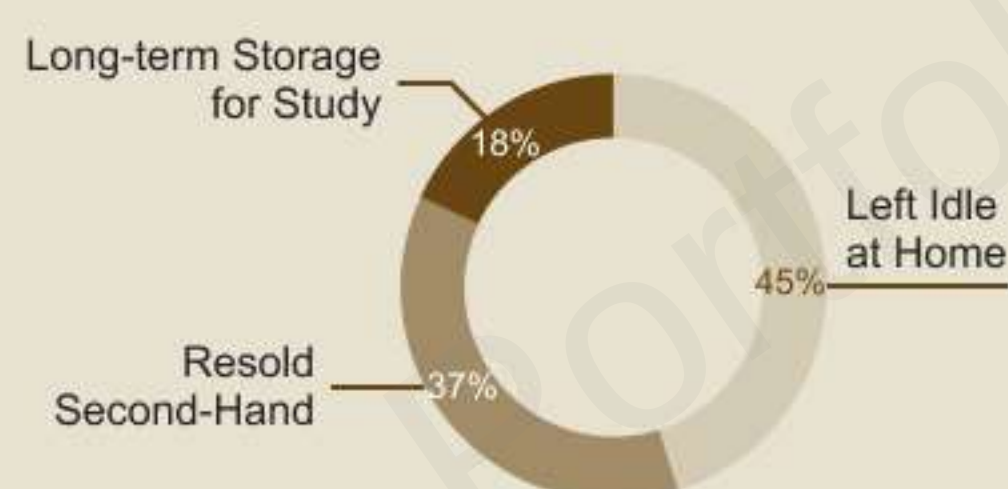
- Detailed descriptions of the book's usage traces, such as notes, creases, and folds.
- These **"traces of use"** are seen as unique charms of the book, enhancing its **emotional value**.



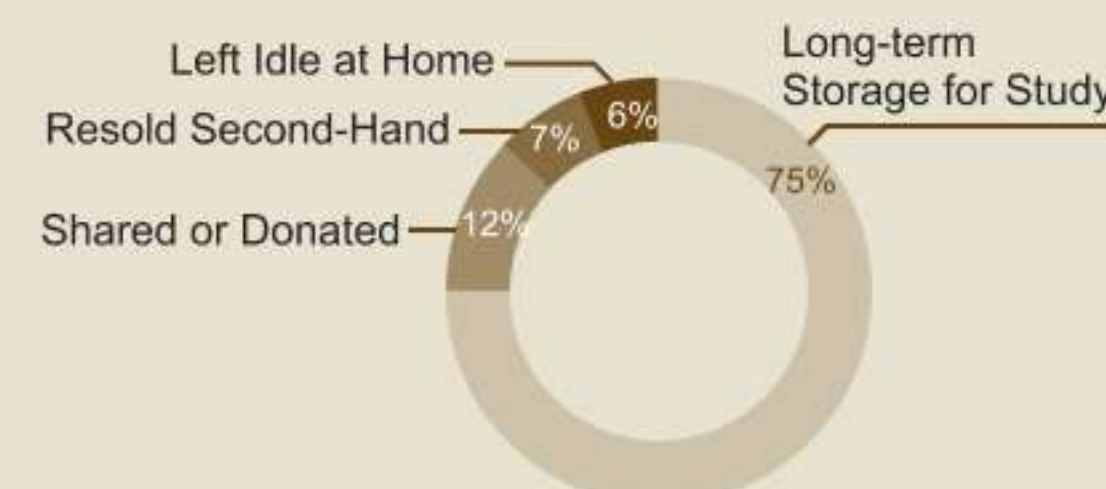
Real Consumer Attitudes

Through a questionnaire survey, 160 responses were collected:

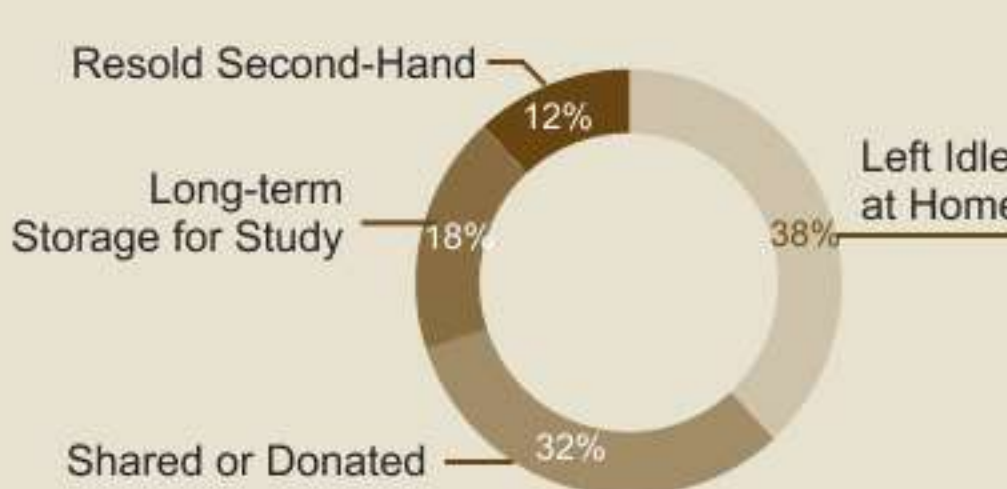
1. School Textbooks



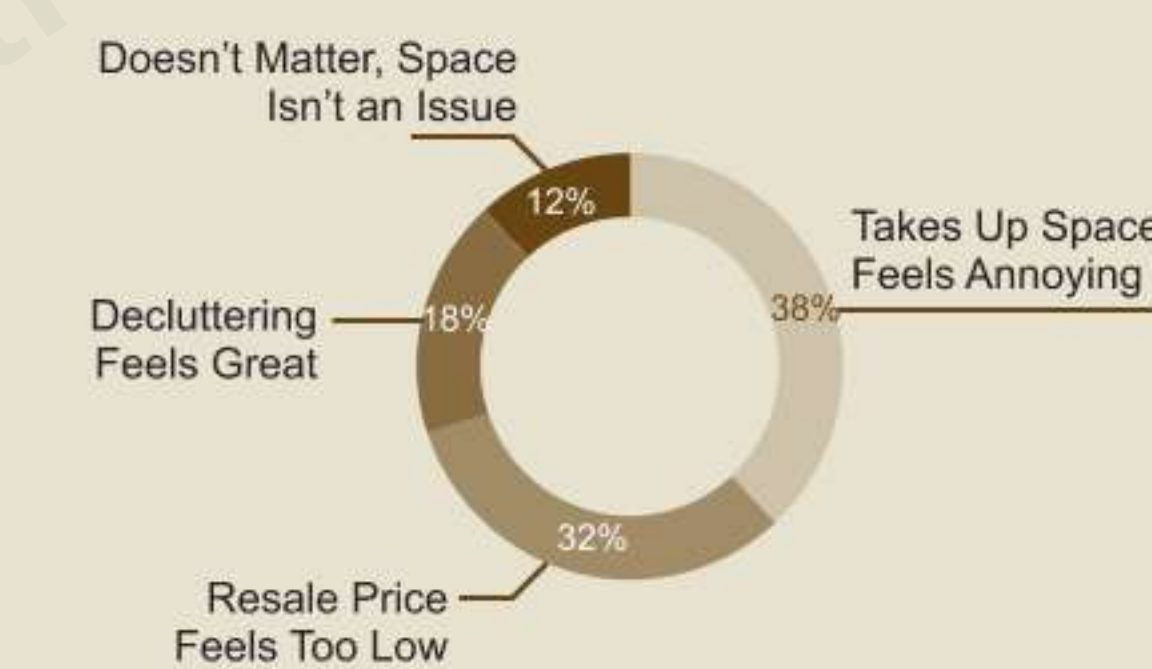
2. Reference Books



3. Novels and Literature



4. Consumer Attitudes Toward Disposal



5. Summary

- 18%: "Decluttering feels great"**
Demand for organizing and disposing of unused books
- 37%: "Reselling used textbooks"**
Indicates a market exists for second-hand textbooks
- 32%: "Resale prices feel too low"**
Highlights the importance of establishing a fair pricing mechanism

Key Insights: Consumers have expectations for decluttering and generating income

- Fair Pricing:** Establish a **transparent system** to address concerns about low resale value.
- Emotional Connections:** Enhance engagement and participation through meaningful connections.

4 Synthesis

Large quantities of textbooks are only used for a short period, leading to significant waste. Current solutions mainly focus on either reselling or recycling paper, with limited innovation in reusing or upcycling textbooks.

Comparison Of Two Recycling Methods

Reuse	Upcycling
Method: Resell or donate textbooks.	Method: Transform into new functional or artistic products.
Limitations: Often limited by outdated content and emotional detachment.	Benefits: Adds emotional and functional value, making books more meaningful.
Outcome: Low engagement, primarily economic benefits.	Outcome: Promotes creativity, education, and sustainability.

Why Upcycling Stands Out

Based on the analysis of carbon emissions, **upcycling** has proven to be the most **environmentally friendly** solution compared to traditional reselling or paper recycling methods. Therefore, I want to design a **localized textbook recycling and upcycling system** for urban communities to help reduce waste and create value from used books, unlike others that focus solely on reselling or paper recycling.

Design Objective

To design a localized textbook recycling and upcycling system for urban communities to reduce waste and create value from used books

System Features

Minimize Transportation Establish local collection points	Offer Reuse Options Encourage book exchanges, workshops, and targeted donations.	Transparent Pricing Implement fair resale pricing mechanisms
Digital Platforms Provide easy-to-use tools for book management	Artistic Transformation Partner with artists to upcycle books	Community Education Raise awareness about recycling benefits

5 Conceptualization

The following flow illustrates the journey of discarded textbooks and how they can gain a second life through a sustainable and meaningful process that fosters **environmental awareness**, **emotional connections**, and **innovative reuse**, creating **lasting value** and **inspiring change**.



After the college entrance exams, students celebrate by tossing their textbooks in the air



Wait! Your textbooks have a better destiny!



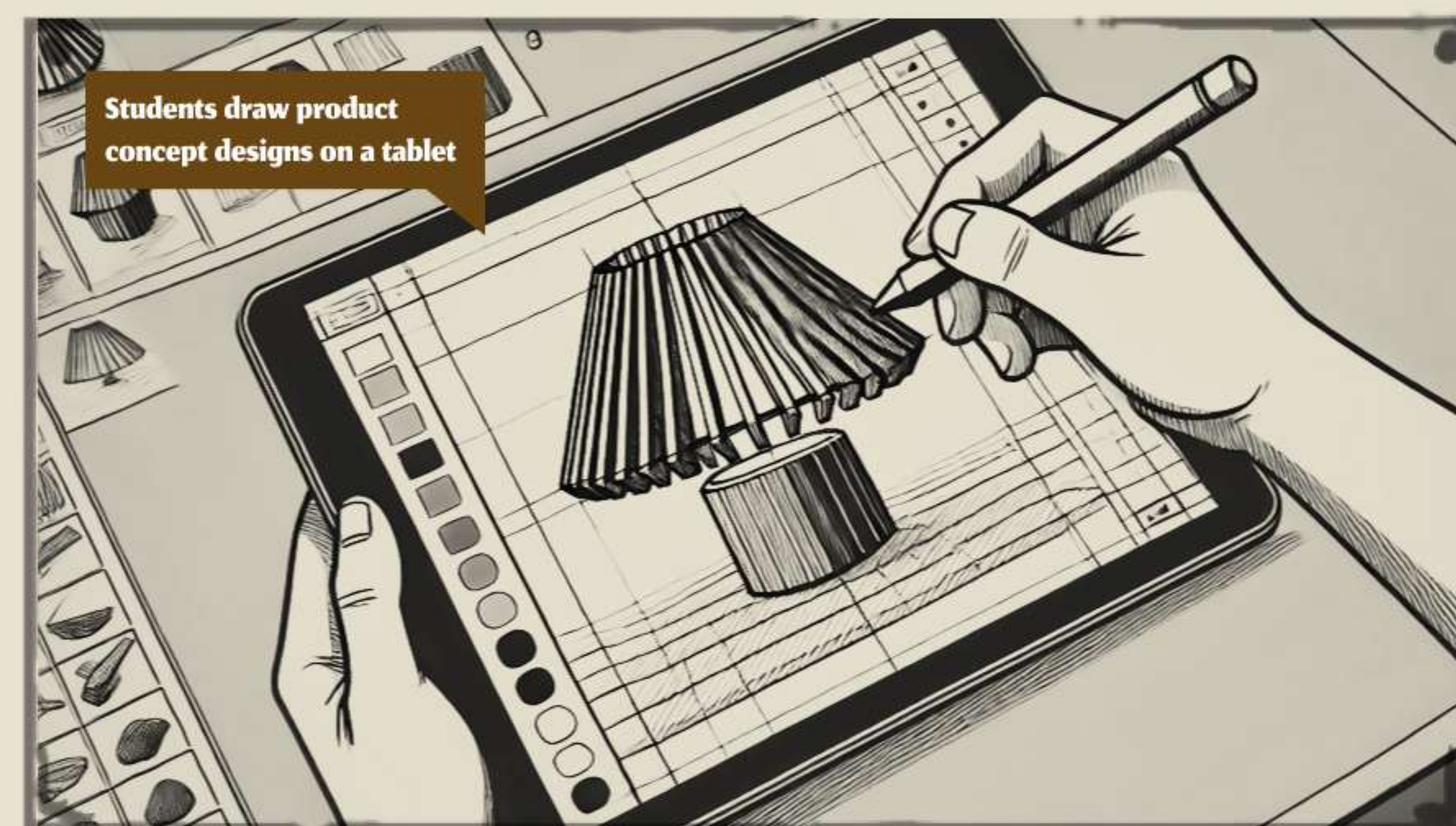
Your textbooks can be transformed into artwork, furniture, or even new learning supplies!



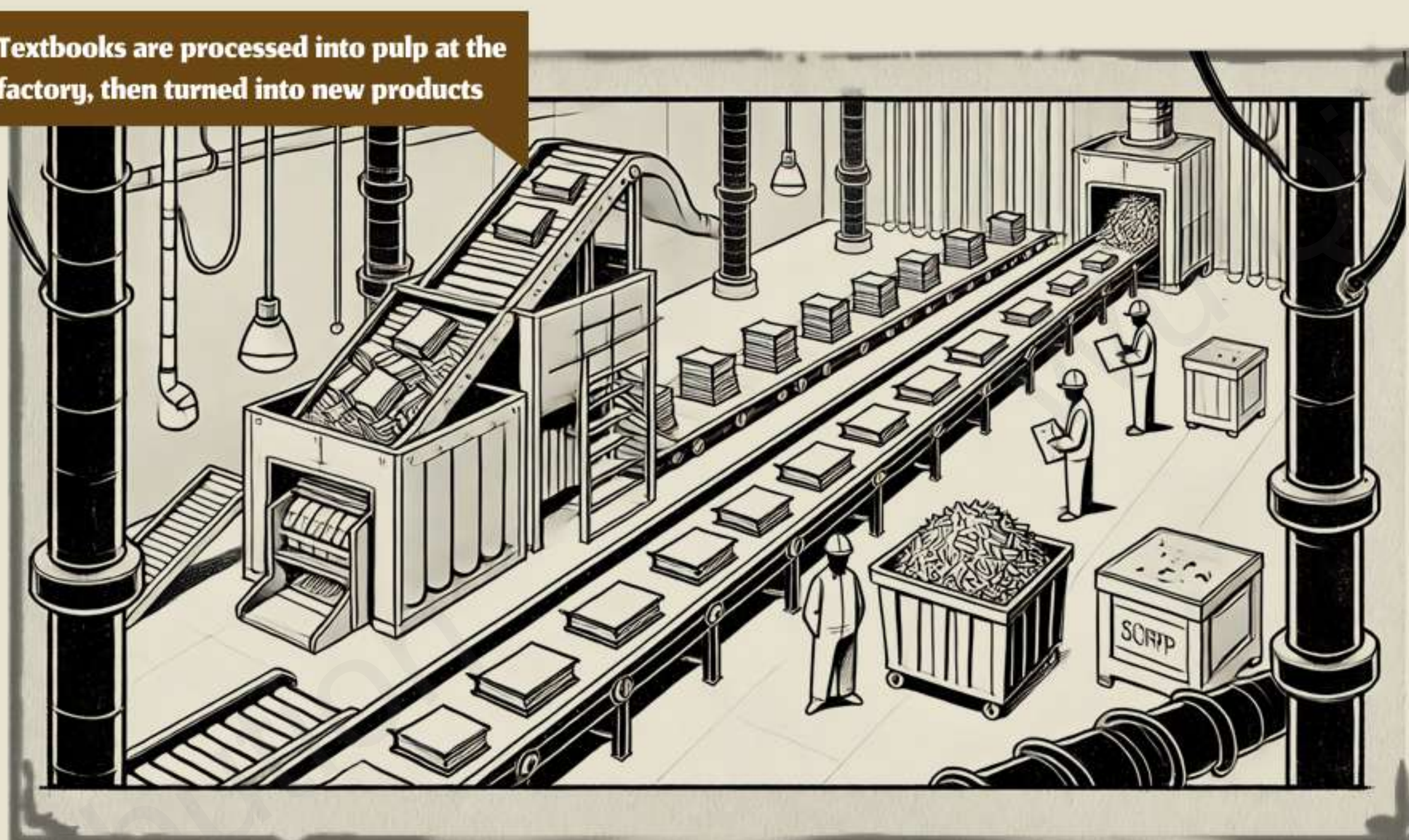
The student visits the drop-off point to recycle their textbooks



Scan this code to track your textbooks' "rebirth journey"!



Students draw product concept designs on a tablet



Textbooks are processed into pulp at the factory, then turned into new products



Priority purchase notification



This lampshade is made from my math books! It's so meaningful

6 Experiments

Procedure



1. Shred the Textbooks into Pieces



2. Blend the paper into pulp



3. Add the Pre-Mixed Materials (Wood Layers, Wood Powder)



4. Blend the Materials



5. Pour the Mixture into Molds



6. Dry the Molds

Optimal Mix Ratios For Paper And Wood Components

Paper pulp	+ Wood chips	+ Wood chips & Wood flour
		
		
Observation: Through the first stage of the experiment, we found that using pure paper pulp results in a soft and fragile shape . Additionally, the pulp tends to form unevenly , making it unsuitable for later cutting or shaping processes.	Observation: In the second stage, the addition of moderate amounts of wood chips to the pulp significantly increased its hardness and strength. However, due to the dense nature of the wood chips, the material was prone to brittleness and cracking .	Observation: In the third stage, the material becomes completely dense and compact after adding the right amount of wood flour to the base mixture. The wood flour mixes well, fills in the gaps and improves the consistency of the final product.

Optimal Ratio (Paper Pulp : Wood Chips : Wood Flour)

3:1:1	2:1:1	1:1:1
Wood flour Wood chips Paper pulp	Wood flour Wood chips Paper pulp	Wood flour Wood chips Paper pulp
Best for high strength, moderate flexibility	A balanced approach, suitable for a variety of applications	Ideal for lightweight, flexible products with moderate strength

The ideal ratio of paper to wood components should be determined based on the specific application needs. For stronger, more durable products, a balanced mixture of paper pulp, Wood chips, and wood flour is necessary. However, adjustments should be made **depending on the desired texture, strength, and flexibility** of the final product.

7 Re-Production

Collaborative Product Design Workshop

Consumers provided insights on desired recycled paper products, which were then explored in a collaborative design workshop. Students brainstormed and contributed to creating **functional, eco-friendly** products that meet everyday needs, focusing on **sustainability, versatility, and aesthetics**.

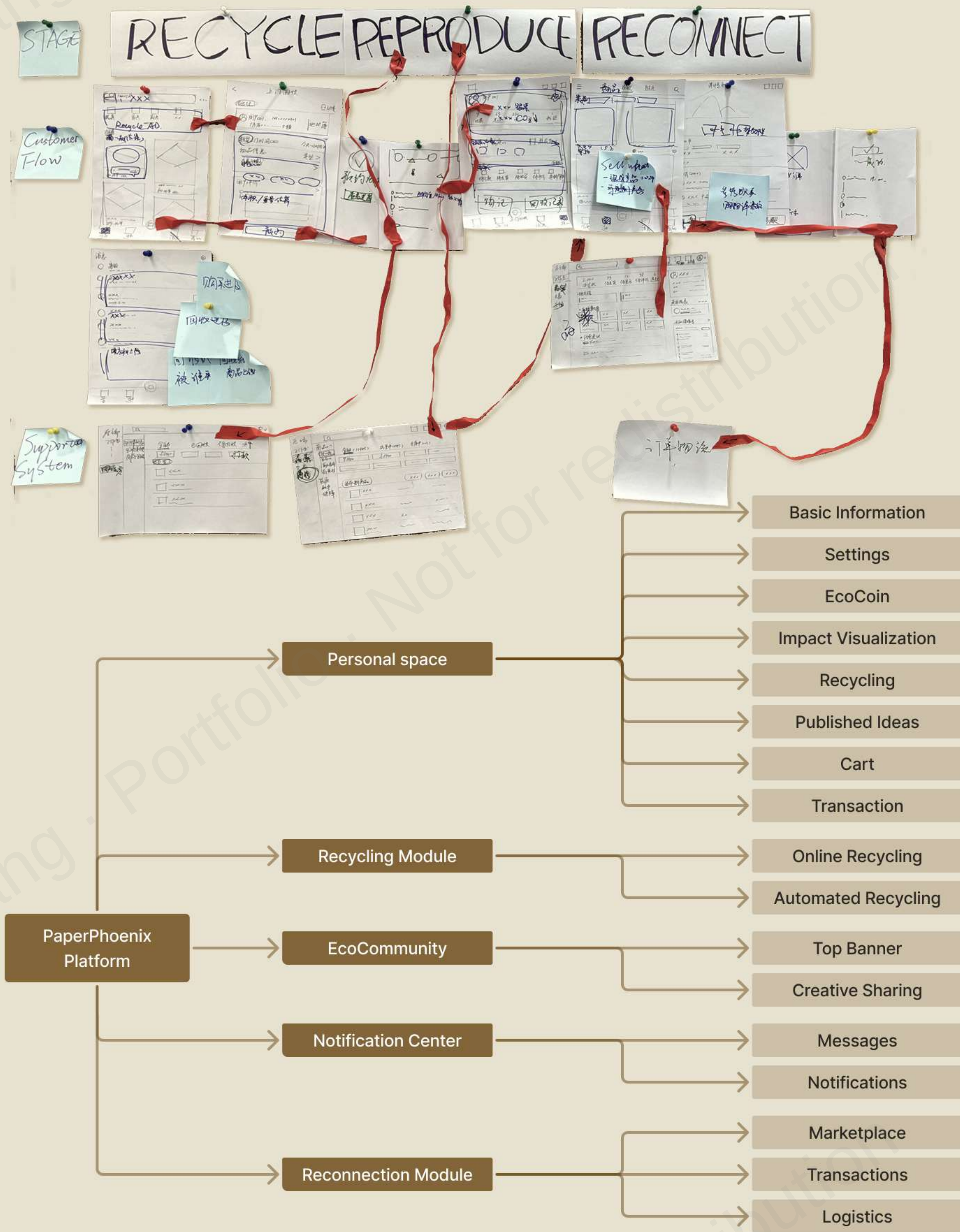


Final Products

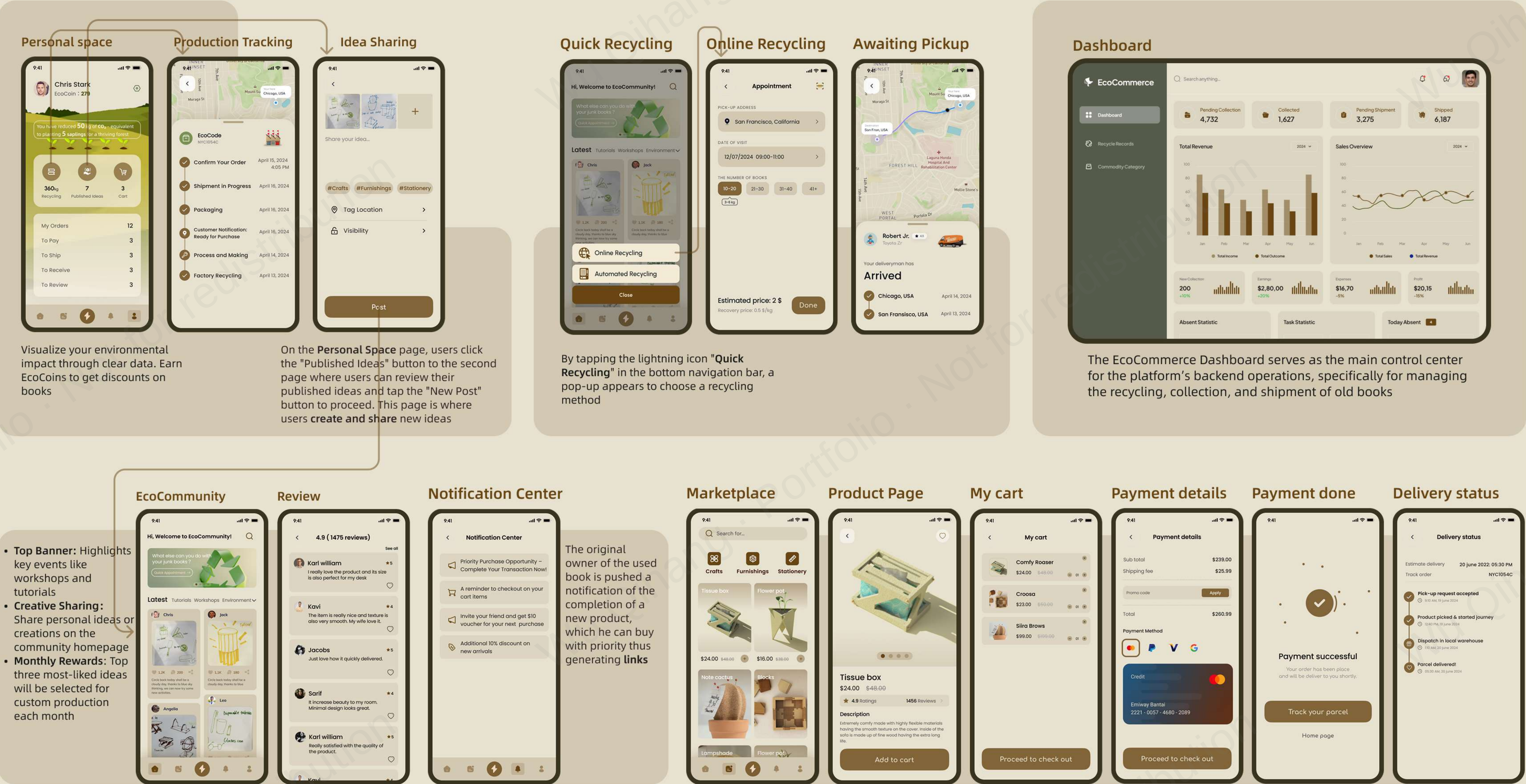
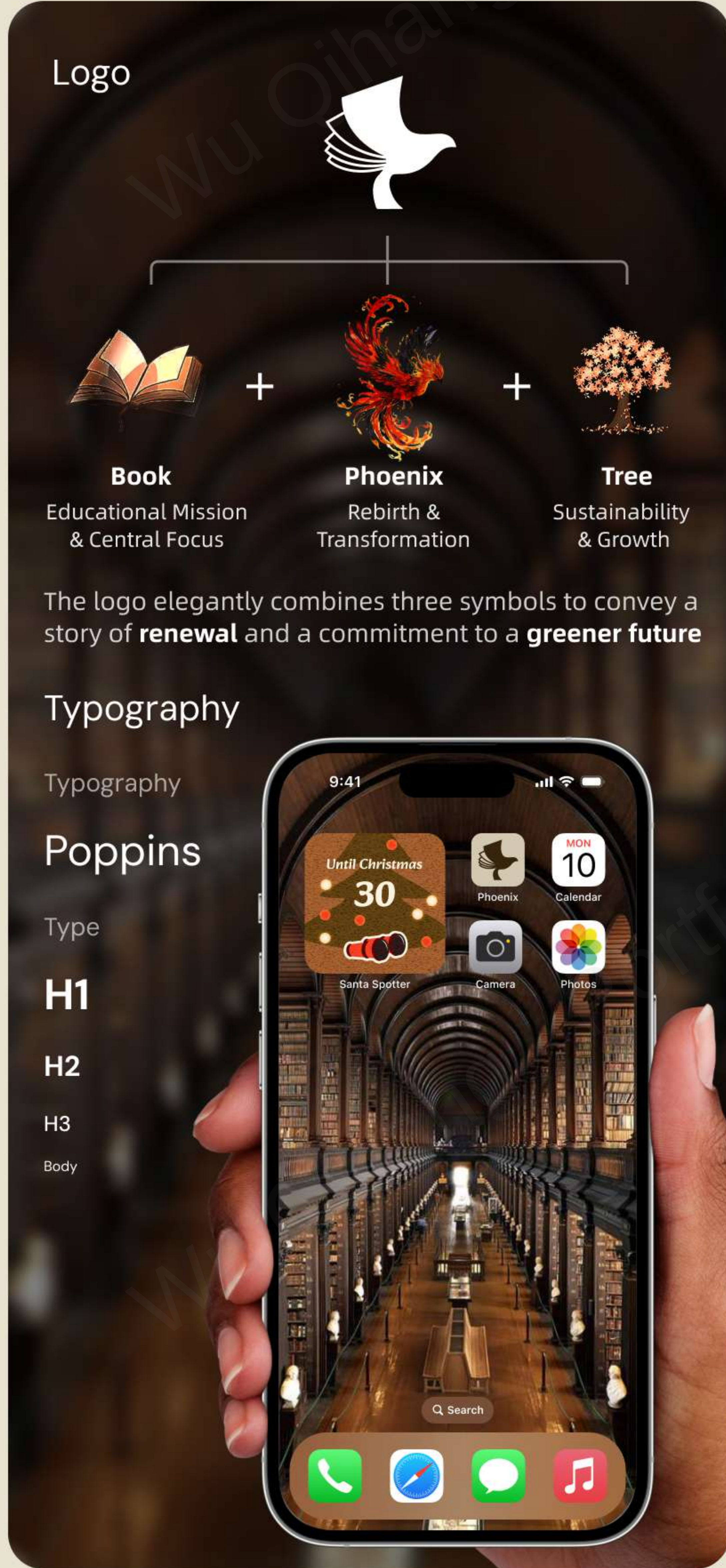
The final recycled paper products, made from repurposed old textbooks, are practical and versatile, designed for everyday use. These include a **cactus-shaped sticky note holder**, a **tissue box**, a **triangular planter**, and a **phone stand**. These products inspire customization options and demonstrate how recycled materials can be integrated into daily life, offering a sustainable **connection to the past**.



8 Information Architecture



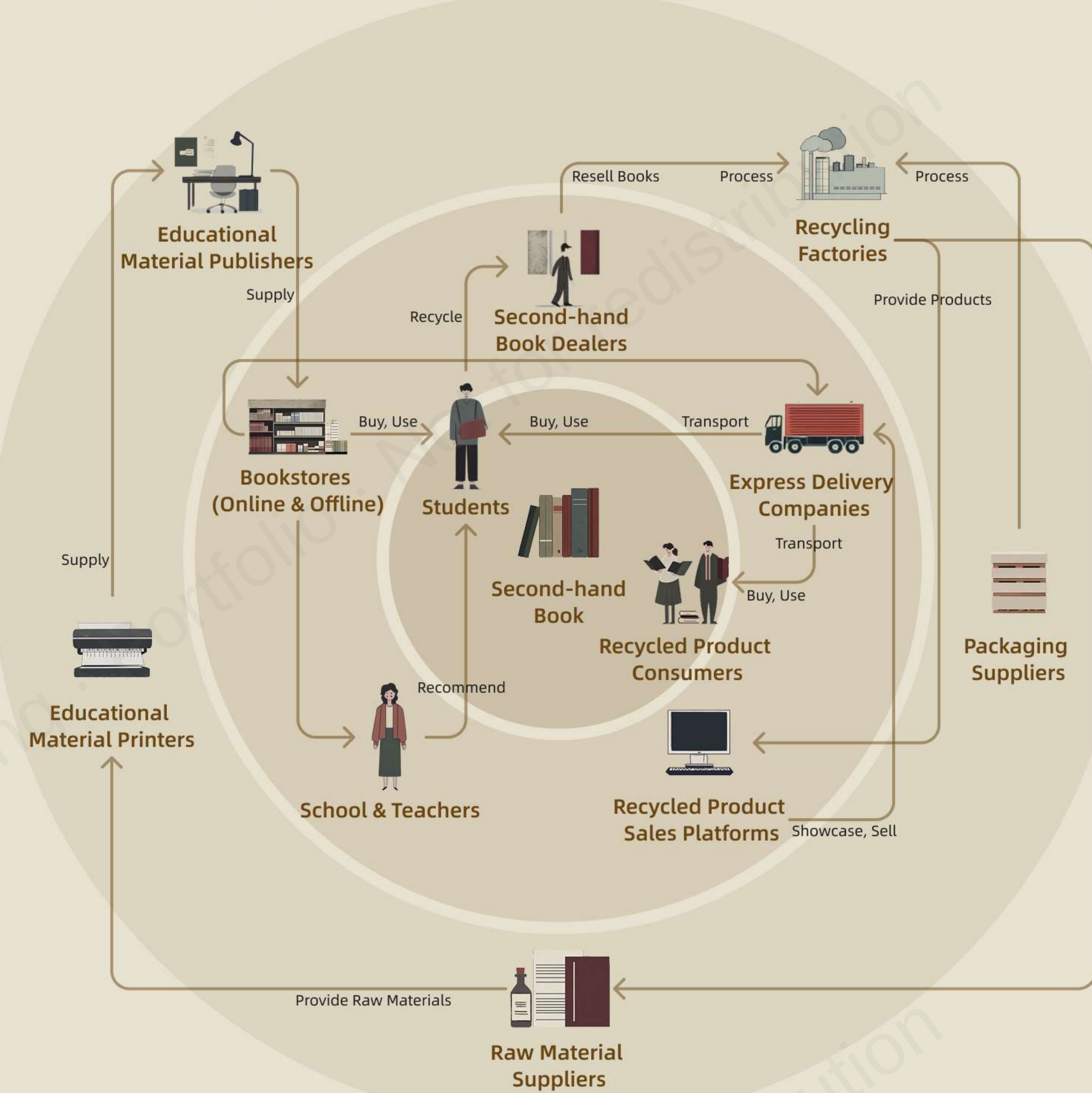
9 High Fidelity



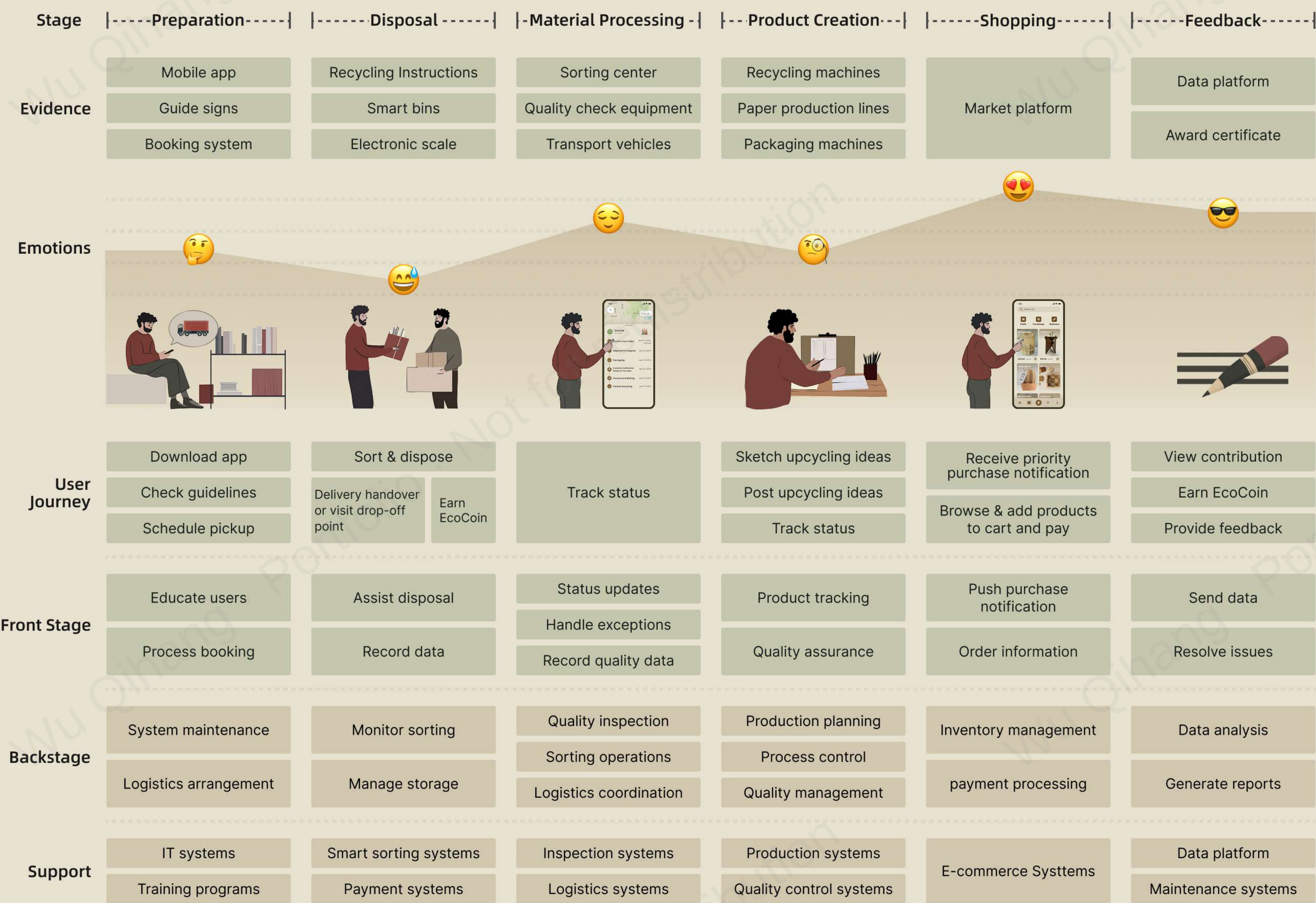
10 System Map

Key Insights

- Incentivize students to recycle by linking rewards to savings (EcoCoin).
- Collect school waste via platforms to streamline reuse.
- Transparency in production encourages engagement.
- Promote trial reuse to expand adoption.
- Reduce raw material dependency by enhancing closed-loop recycling.



11 Service Blueprint



12 Transitional Model

