SAP

ASEAN DATA SCIENCE EXPLORERS

BINUS UNIVERSITY

Digital Defense Against Stunting

Unlocking Child Potential

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In Partnership With:

Habitat for Humanity

RS Premier Jatinegara

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING


WHAT DO YOU
SEE IN THIS
PICTURE?

A MOTHER HOLDING HER CHILD?
LOOK CLOSER. A FRAGILE BODY, A BED FULL OF MEDICINE, AND A FIGHT AGAINST TIME.

THIS IS STUNTING, SILENT, CRUEL, YET PREVENTABLE.

Problem Statement

Child stunting persists as a critical public health crisis in ASEAN, driven by malnutrition, food insecurity, and inequitable access to healthcare during the first 1000 days since child conception, disproportionately affecting rural communities. Without immediate intervention, the region faces lasting developmental and economic consequences, threatening progress toward 2030 nutrition and health targets.

Did you know?

SOURCE : World Health Organization

1 IN 4

children under five in ASEAN is stunted

1

child lost to stunting is one

future we can never get back

“For one child, stunting doesn't just stunt growth

it stunts dreams, potential, and the future”

SDG 2
Zero Hunger

- Aims to reduce all forms of malnutrition by 2030
- Supports vulnerable groups like children, pregnant women, and the poor
- Targets stunting reduction as a key nutrition indicator

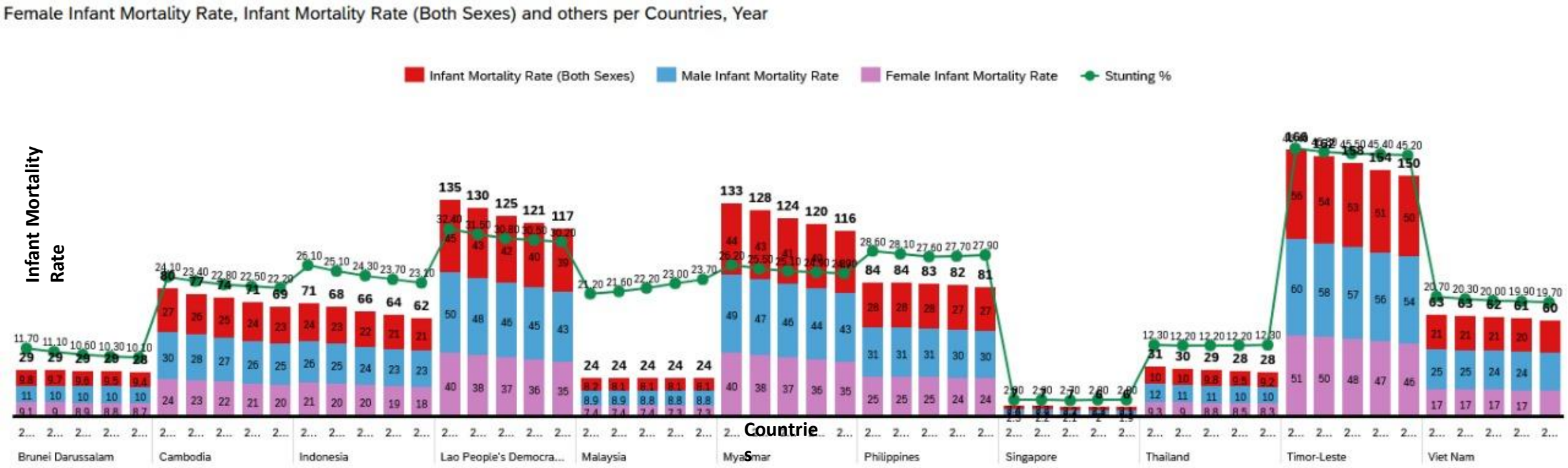
SDG 3
Good Health & Well-Being

- Reduces child mortality & malnutrition-related deaths
- Ensures access to essential health services
- Promotes healthy lives for all ages

SOURCE

ADB ASIAN DEVELOPMENT BANK

Infant Mortality Rate Correlation

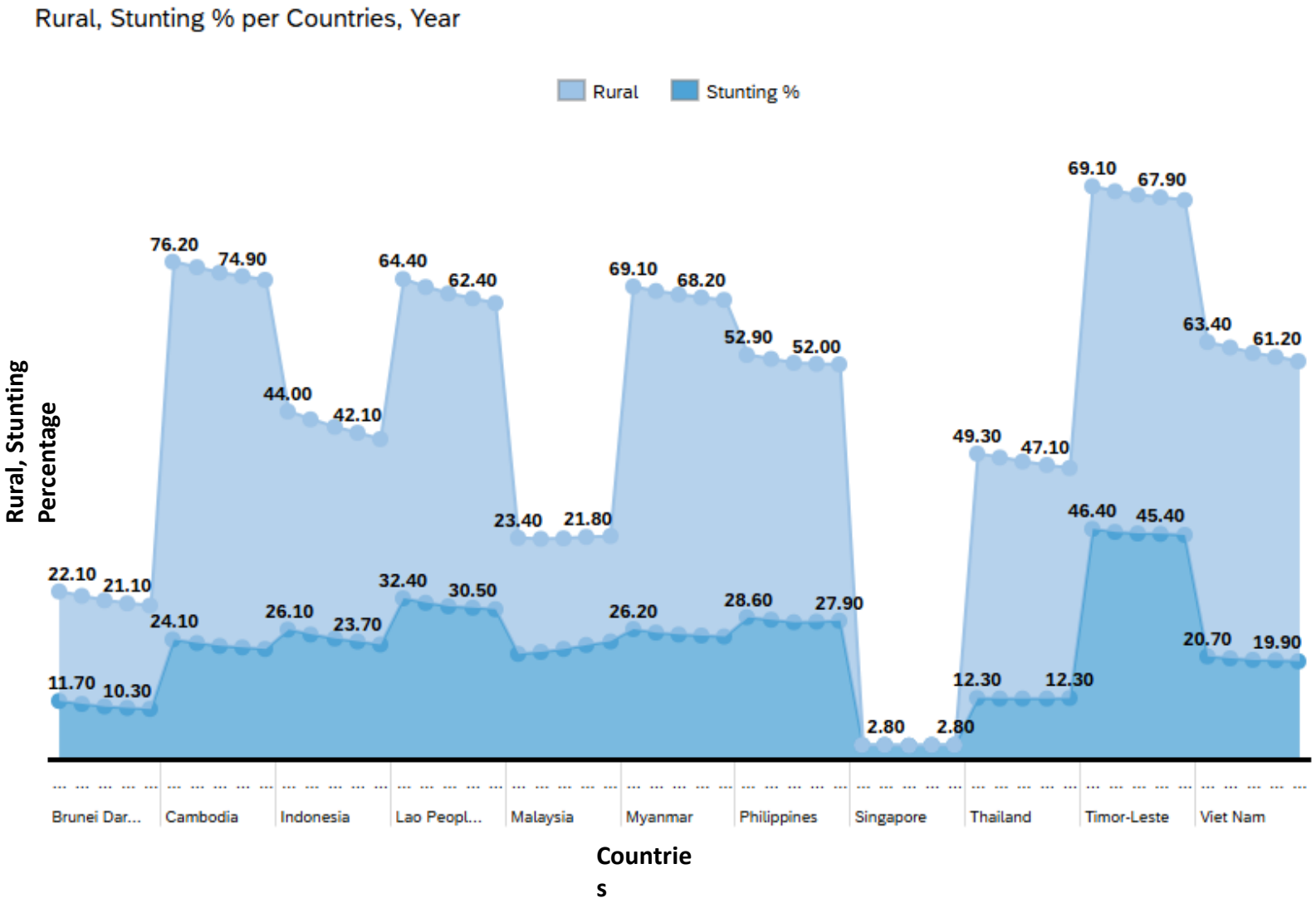


- The data indicates high correlation between **infant mortality rates** and **stunting prevelancy rate.**
- With **high stunting,** it also leads to **high infant mortality rate,**
- with the highest **mortality rate** in **Timor Leste, Myanmar** and **Lao** up to **50% and higher.**

SOURCE

ADB ASIAN DEVELOPMENT BANK

Rural and Stunting correlation



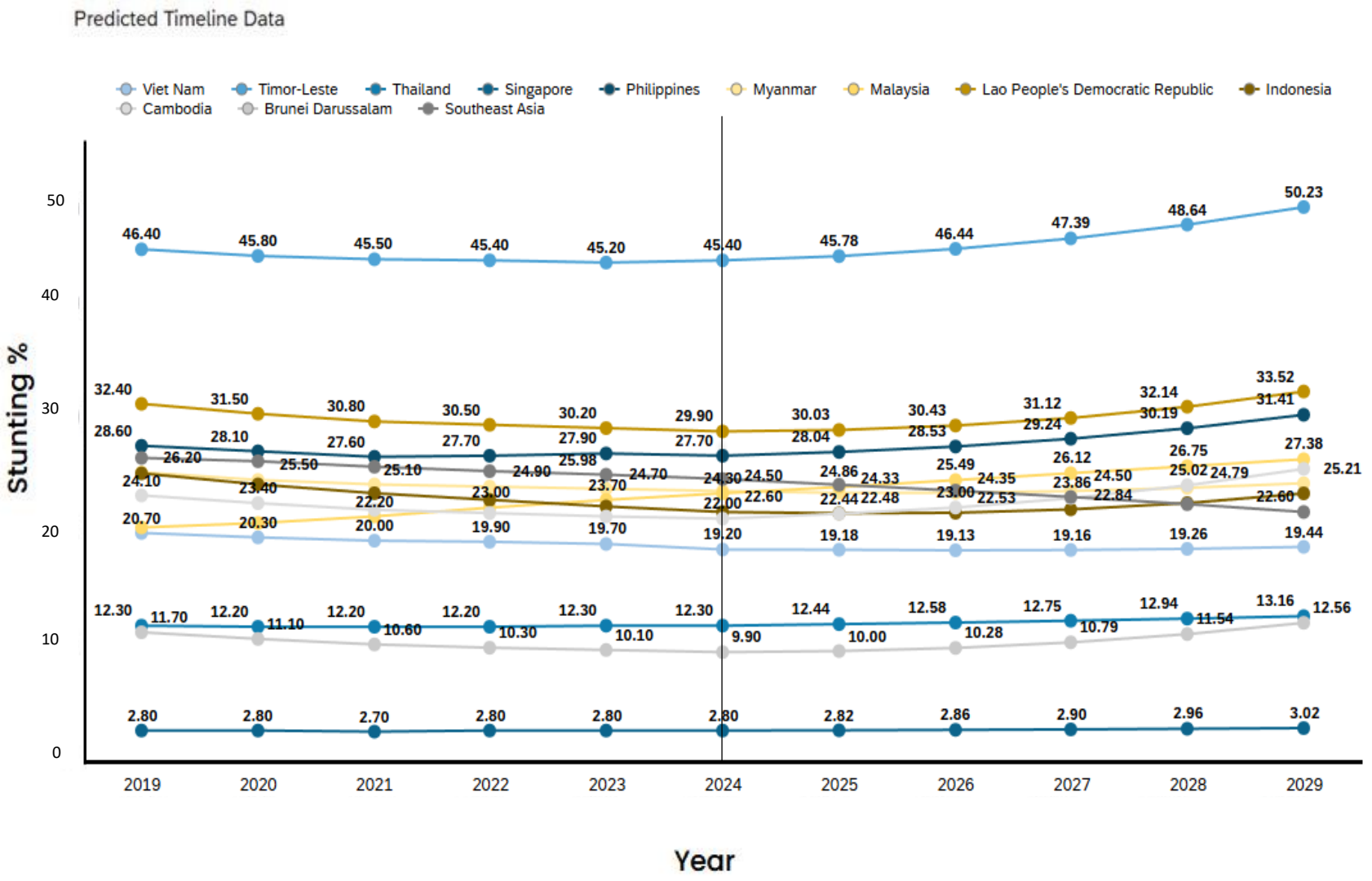
- If you look closely, you can see how countries with **high rural areas** also have **high amounts of stunting.**
- **Cambodia** has the highest amount of rural population, having **1 in 4 children being stunted.**

	Stunting %	Rural
Stunting %	1	0,70449121
Rural	0,704491208	1

SOURCE

ADB ASIAN DEVELOPMENT BANK

Our Prediction for the Future



- As you can see, there are increases throughout the board with the **worst** being in **Timor Leste** with it ending up at **50% from 46%**
- This means that 1 in 2 children born in Timor Leste are **under threat of stunting** through **malnutrition.**

```
--- Southeast Asia ---
   - Linear Regression RMSE      : 0.20
   - 2nd-Degree Polynomial RMSE  : 0.11
   - 3rd-Degree Polynomial RMSE  : 0.04
   => Best Model Found: Poly (3rd) (RMSE: 0.04)
```

```
--- Brunei Darussalam ---
   - Linear Regression RMSE      : 0.38
   - 2nd-Degree Polynomial RMSE  : 0.28
   - 3rd-Degree Polynomial RMSE  : 0.10
   => Best Model Found: Poly (3rd) (RMSE: 0.10)
```

```
--- Lao People's Democratic Republic ---
   - Linear Regression RMSE      : 0.65
   - 2nd-Degree Polynomial RMSE  : 0.36
   - 3rd-Degree Polynomial RMSE  : 0.16
   => Best Model Found: Poly (3rd) (RMSE: 0.16)
```

```
--- Timor-Leste ---
   - Linear Regression RMSE      : 0.72
   - 2nd-Degree Polynomial RMSE  : 0.30
   - 3rd-Degree Polynomial RMSE  : 0.10
   => Best Model Found: Poly (3rd) (RMSE: 0.10)
```

```
--- Singapore ---
   - Linear Regression RMSE      : 0.10
   - 2nd-Degree Polynomial RMSE  : 0.04
   - 3rd-Degree Polynomial RMSE  : 0.04
   => Best Model Found: Poly (3rd) (RMSE: 0.04)
```

```
--- Viet Nam ---
   - Linear Regression RMSE      : 0.53
   - 2nd-Degree Polynomial RMSE  : 0.16
   - 3rd-Degree Polynomial RMSE  : 0.16
   => Best Model Found: Poly (3rd) (RMSE: 0.16)
```

```
--- Thailand ---
   - Linear Regression RMSE      : 0.46
   - 2nd-Degree Polynomial RMSE  : 0.05
   - 3rd-Degree Polynomial RMSE  : 0.05
   => Best Model Found: Poly (3rd) (RMSE: 0.05)
```

```
--- Cambodia ---
   - Linear Regression RMSE      : 1.26
   - 2nd-Degree Polynomial RMSE  : 0.23
   - 3rd-Degree Polynomial RMSE  : 0.08
   => Best Model Found: Poly (3rd) (RMSE: 0.08)
```

```
--- Indonesia ---
   - Linear Regression RMSE      : 0.50
   - 2nd-Degree Polynomial RMSE  : 0.28
   - 3rd-Degree Polynomial RMSE  : 0.07
   => Best Model Found: Poly (3rd) (RMSE: 0.07)
```

```
--- Malaysia ---
   - Linear Regression RMSE      : 0.36
   - 2nd-Degree Polynomial RMSE  : 0.17
   - 3rd-Degree Polynomial RMSE  : 0.16
   => Best Model Found: Poly (3rd) (RMSE: 0.16)
```

```
--- Myanmar ---
   - Linear Regression RMSE      : 0.47
   - 2nd-Degree Polynomial RMSE  : 0.21
   - 3rd-Degree Polynomial RMSE  : 0.19
   => Best Model Found: Poly (3rd) (RMSE: 0.19)
```

```
--- Philippines ---
   - Linear Regression RMSE      : 0.36
   - 2nd-Degree Polynomial RMSE  : 0.32
   - 3rd-Degree Polynomial RMSE  : 0.18
   => Best Model Found: Poly (3rd) (RMSE: 0.18)
```

RMSE Total Average: 0.11

Why is our Prediction Reliable?

$$\text{RMSE} = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}$$

It shows how close the model's predicted values are to the actual values —
The lower the RMSE, the better the model's accuracy

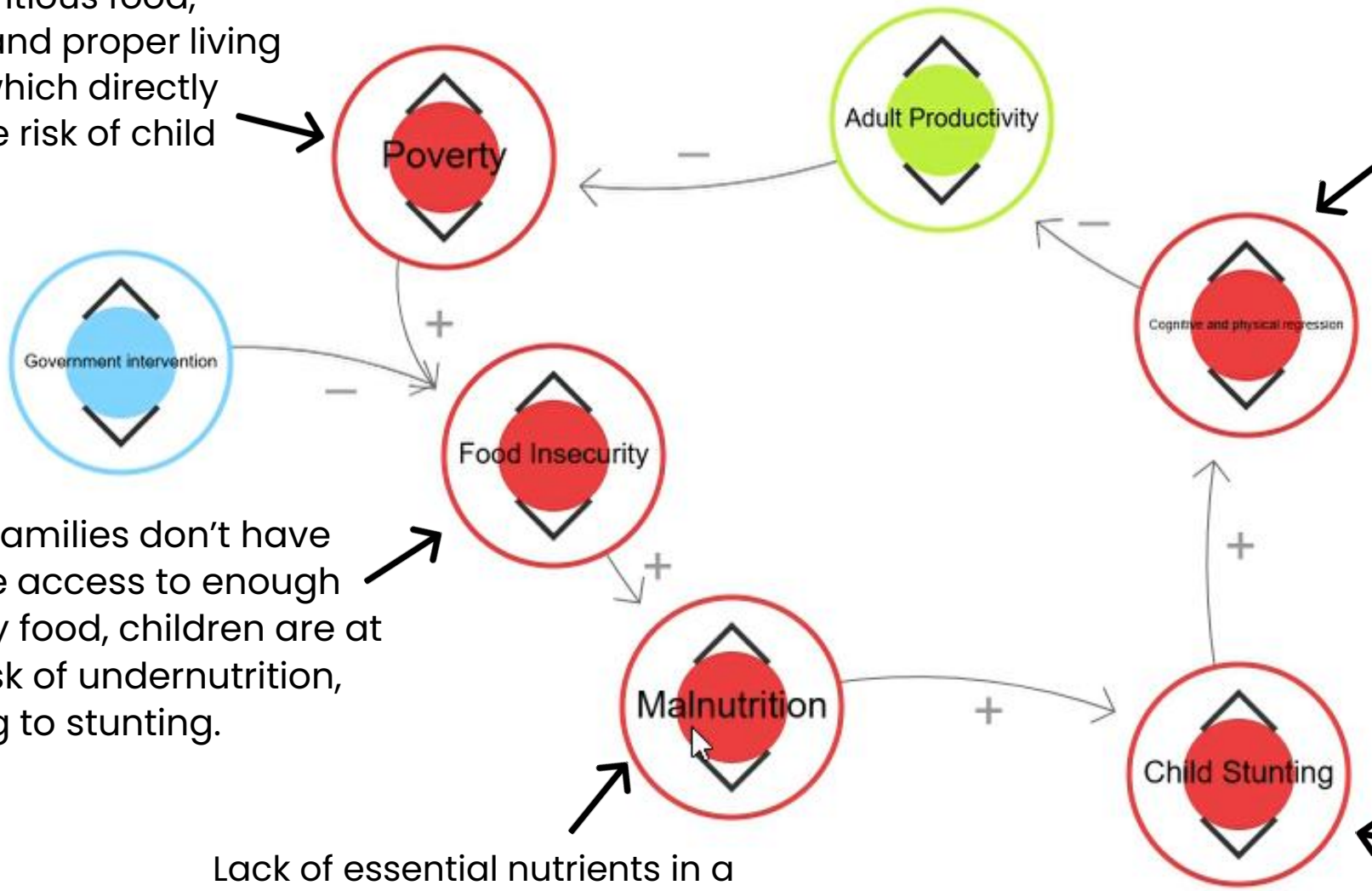
The Problem

From a Systems Thinking POV

Limited financial resources make it difficult for families to afford nutritious food, healthcare, and proper living conditions, which directly increases the risk of child stunting.

Stunting reduces future work ability, continuing the cycle of poverty.

Stunted children may suffer from weakened immunity, poor health, and reduced physical abilities, further impacting their development and future productivity.

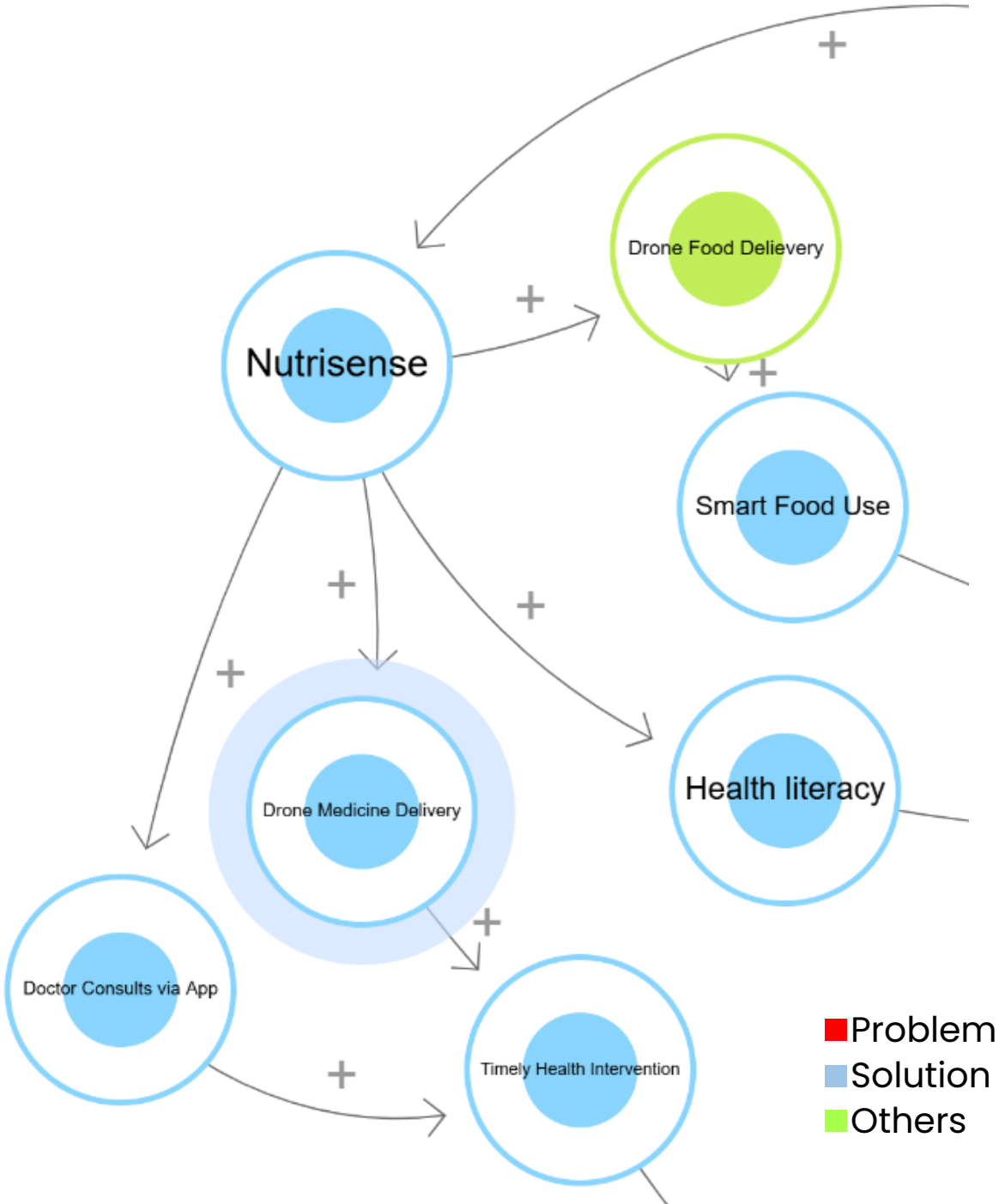


Problem
Solution
Others

When families don't have reliable access to enough healthy food, children are at high risk of undernutrition, leading to stunting.

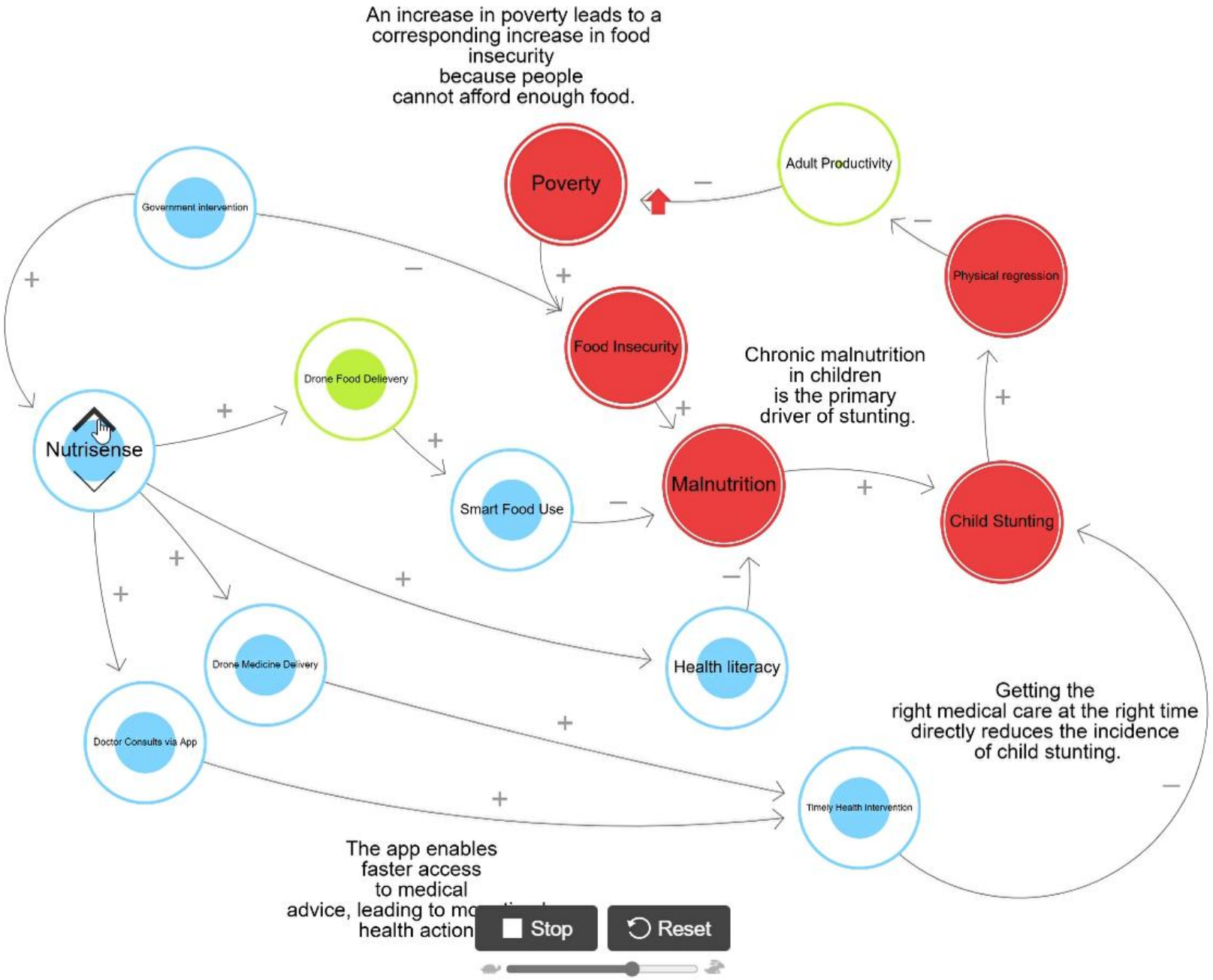
Lack of essential nutrients in a child's diet disrupts growth and development, becoming a direct cause of stunting.

Chronic undernutrition causing short height for age and delayed development.



The Solution

- **Nutrisense App:** A central platform that connects users to health services, food, and medical support.
- **Drone Food Delivery:** Delivers nutritious meals to remote or underserved areas, improving access.
- **Smart Food Use:** Promotes the efficient and informed use of food through meal suggestions and education.
- **Drone Medicine Delivery:** Ensures timely delivery of essential medicines to users in hard-to-reach locations.
- **Doctor Consults via App:** Provides online consultations with healthcare professionals for quick advice and treatment.
- **Timely Health Intervention:** Detects health issues early through the app and enables fast response.
- **Health Literacy:** Educates users on nutrition, hygiene, and health practices to empower long-term wellbeing.



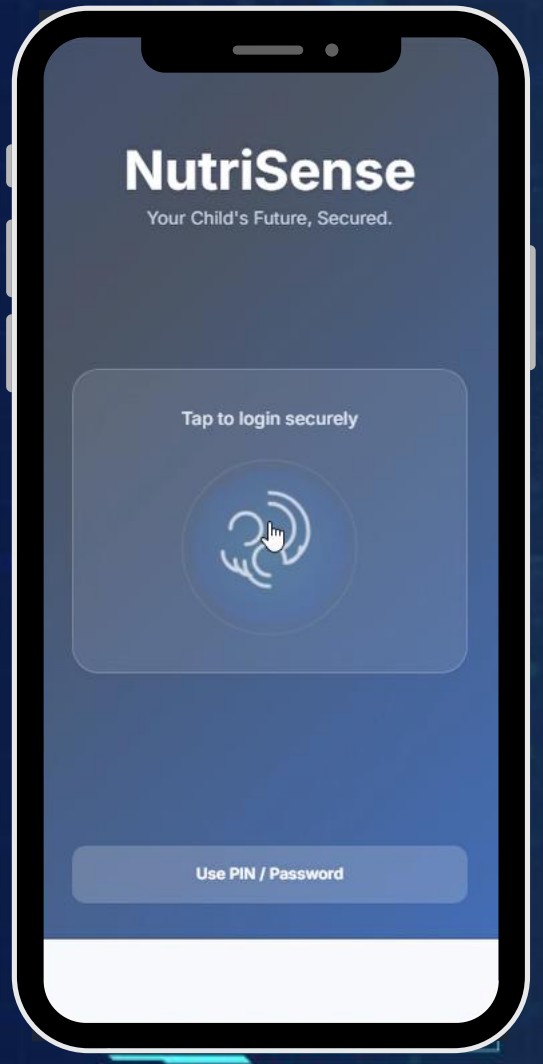
The Result

As you can see from the result of NutriSense, it **smooths and speeds up** the process of **stunting prevention**, and with the help of government intervention/funding we can exacerbate it even more down to **zero** as shown below.

Problem
Solution
Others


N.E.X.U.S
SYSTEM
Nutritional & Emergency eXpress Unmanned Supply
Start
Veo

What is our System?



NutriSense

NutriSense is a mobile health application that helps families keep track of their child's development through connecting them to essential care and nutrition services. Our services include:
AI Symptom Checker: Offers quick health assessments for early action.
Doctor Consultations: Provides live access to certified medical professionals.
NutriScan Tool: Scans food items for nutritional guidance and meal ideas. (Computer Vision & AI)
Growth Tracker: Monitors child development to detect stunting early.
Stunting Heat Map: Shows high-risk areas and nearby health centers.
Donation Portal: Supports aid for food, medicine, and services.
N.E.X.U.S. Integration: Links to drones and lockers for secure supply delivery.

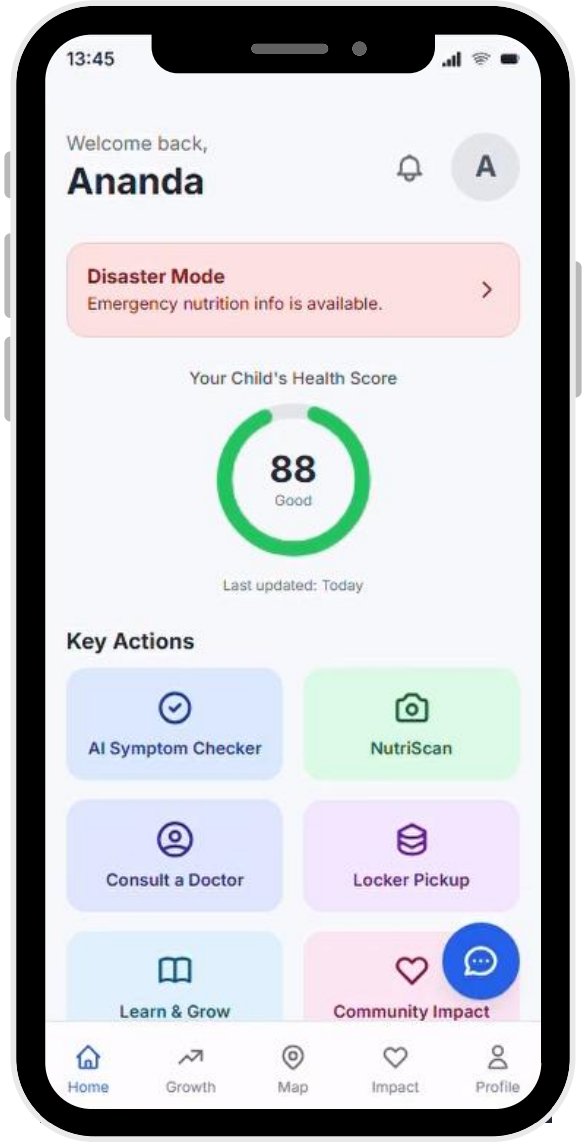
N.E.X.U.S

The N.E.X.U.S. is our state-of-the-art smart delivery network, allowing our users to have their needs met in a timely manner all under one easy to use system. Key components include:
- **Autonomous Drones**: Transport medicine and food quickly to remote or congested areas.
- **Drone Navigation System**: Equipped with AI, obstacle detection, and GPS for precision delivery.
- **SmartCam QR Module**: Verifies recipients through QR codes to ensure secure handovers.
- **Secure Lockers**: Climate-controlled, tamper-proof storage for safe pickup of supplies.
- **AI-Powered Security**: Continuous surveillance with environmental sensors and CCTV.
- **Biometric Verification**: Fingerprint access for authorized users only.
- **Solar-Powered Infrastructure**: Operates off-grid, ideal for rural or disaster-prone regions.

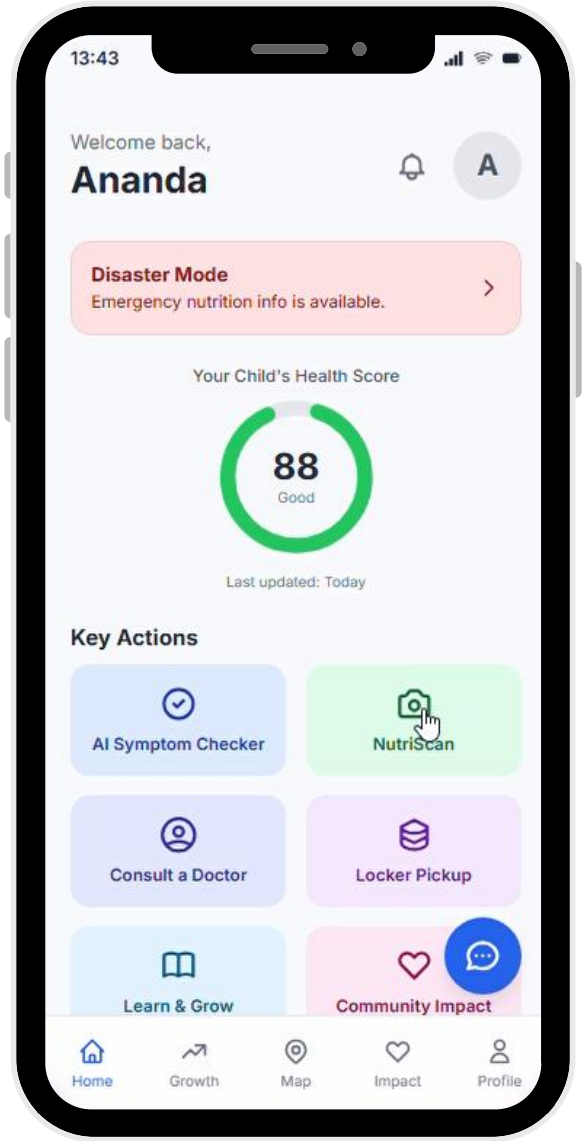
Scan to Open App

AI Symptoms Checker & Nutriscan

AI Symptom Checker & Doctor Consultation:
Quickly identifies potential health issues based on symptoms and connects users with doctors for fast, online consultations.
Benefit: Saves time, provides peace of mind, and ensures early medical intervention from anywhere.
NutriScan:
Scans food items to deliver instant nutritional information and tailored health advice.
Benefit: Empowers users to make healthier food choices, supports child nutrition, and improves long-term wellbeing.



AI & Doctor Consultation

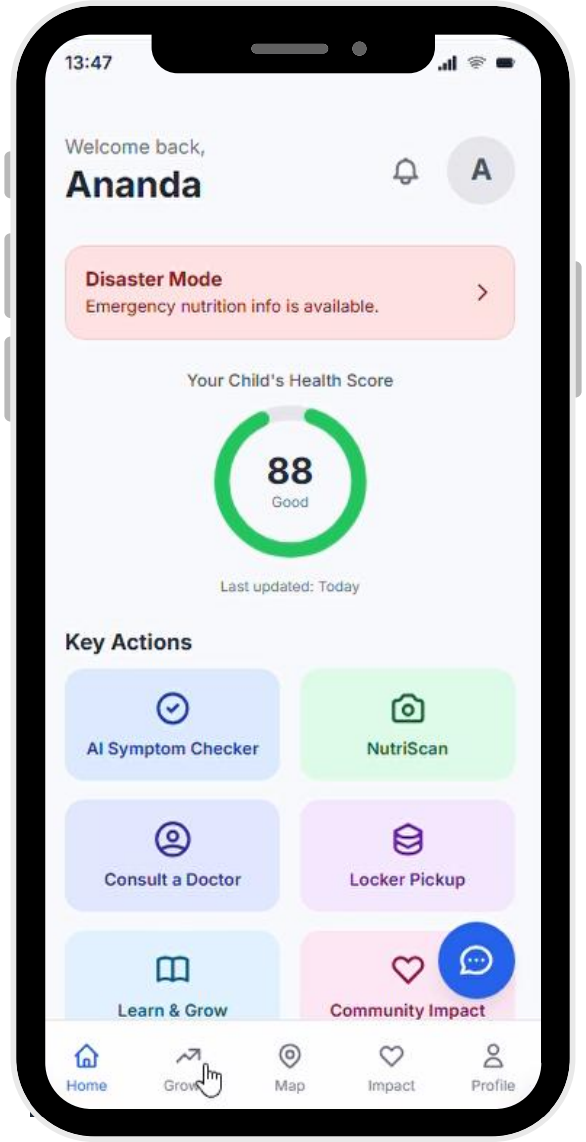


NutriScan

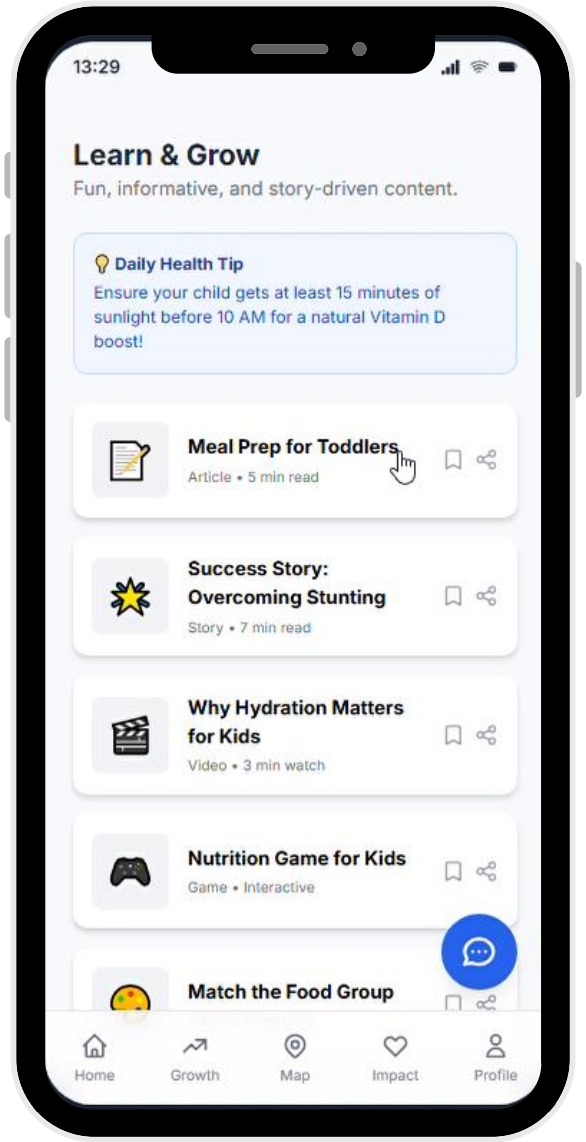
Scan for App

Growth Tracker & Learn Page

Growth Tracker:
Monitors a child's height and weight, comparing progress against WHO standards.
Benefit: Helps parents track their child's development, detect potential growth issues early, and maintain overall health awareness.
NutriEdu Library (Learn Page):
Delivers concise lessons on child nutrition, hygiene, and available support programs.
Benefit: Empowers families with practical knowledge to improve health and access resources.



Growth Tracker

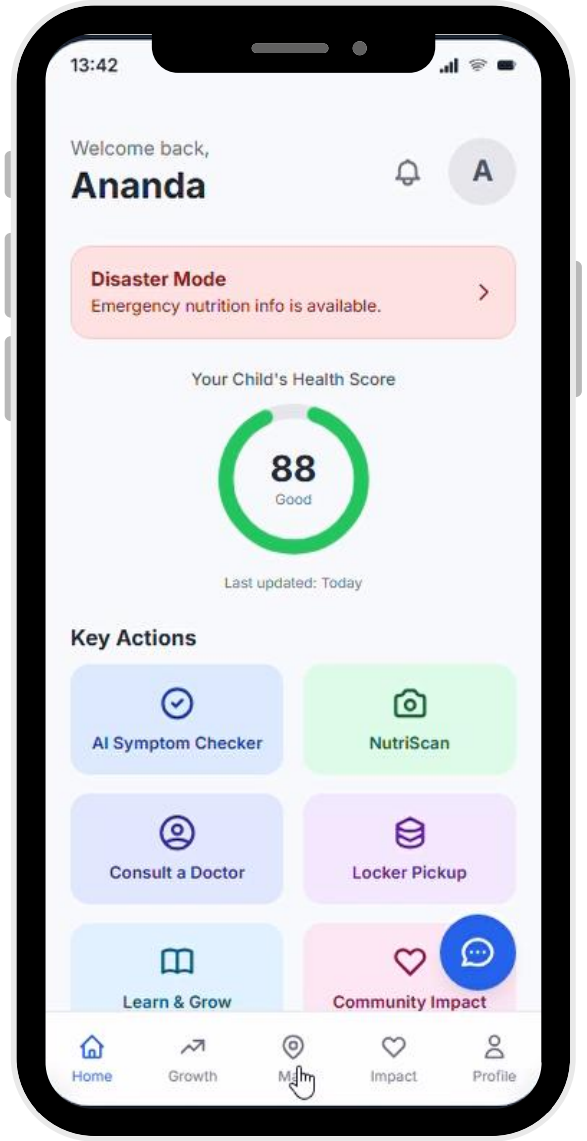


Learn Page

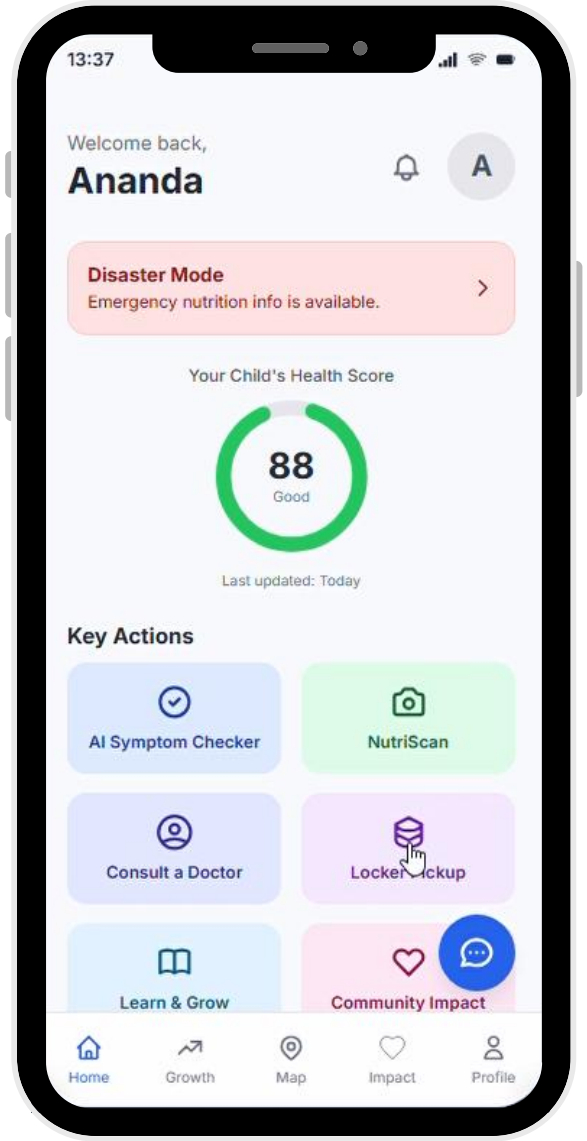
Scan for App

Stunting Heat Map & Locker Pick-up

Stunting Heat Map:
Presents real-time data on stunting prevalence across regions, while highlighting the nearest healthcare centers and Nexus Lockers for accessible medicine and food collection.
***Benefit*:** Facilitates timely assistance by directing users to the closest support services, improving response and resource distribution.
Nexus Locker Pickup:
Enables users to collect medicine or nutrition packages from secure Nexus Lockers using a QR code or PIN.
***Benefit*:** Provides safe, contactless, and convenient access to essential supplies, reducing wait times and improving distribution efficiency.



Stunting Heat Map

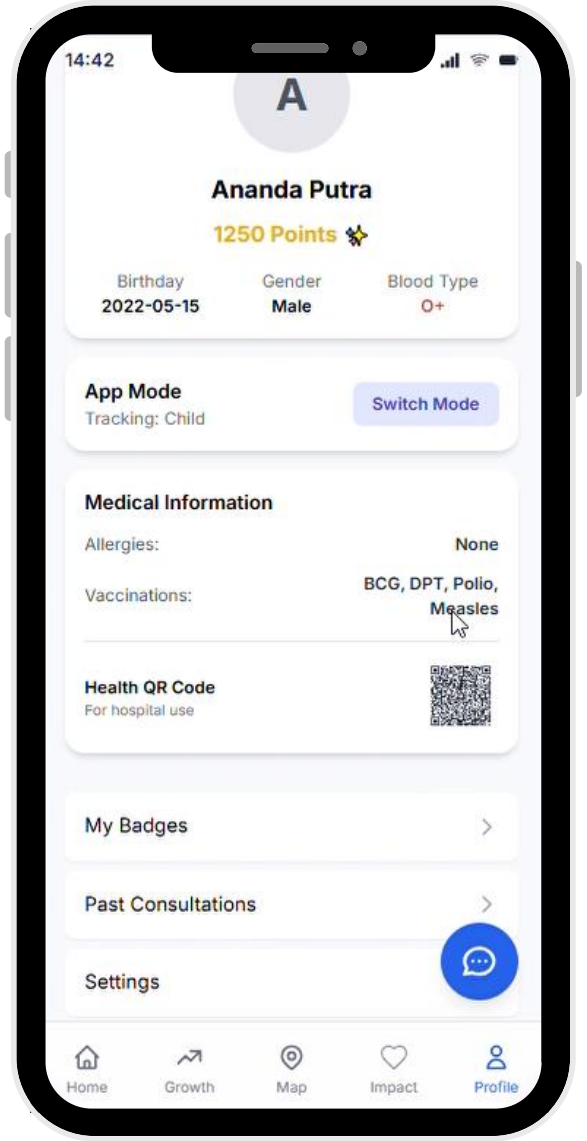


Locker Pick-up

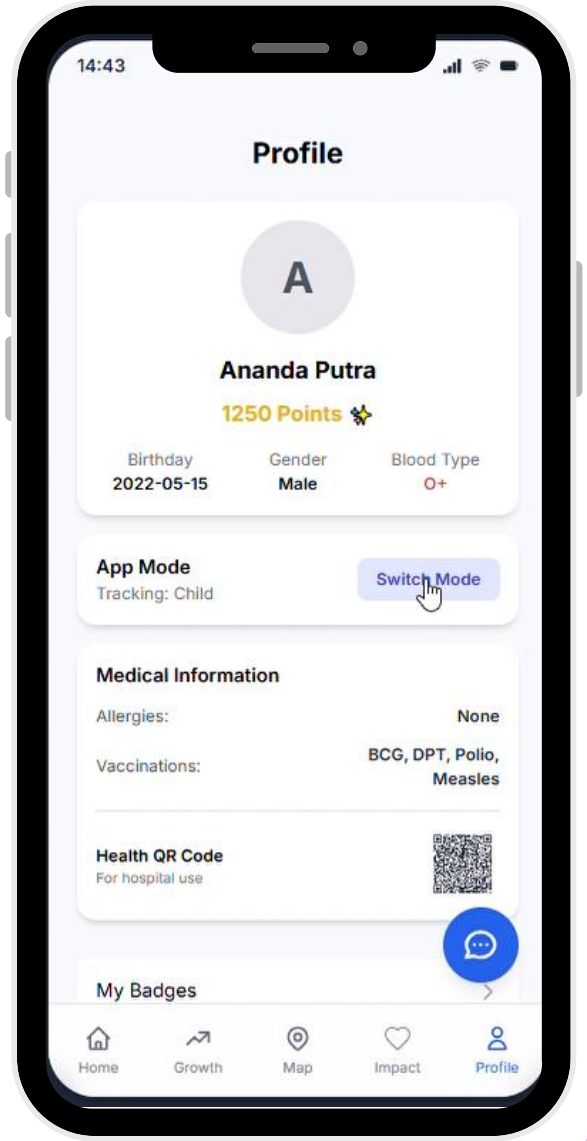
Scan for App

Profile Page & Mode Switch

User Profile Page:
Displays user details and provides access to badges, linked health accounts (KIA/BPJS), settings, and volunteer features.
Benefit: Centralizes user information and preferences for easier navigation and personalized experience.
Mode Switch:
Switches modes to focus on the mother's mode during the first 1000 days since conception for peak stunting prevention.
Benefit: Tightens focus on stunting prevention in the most crucial time period for child's development



Profile Page

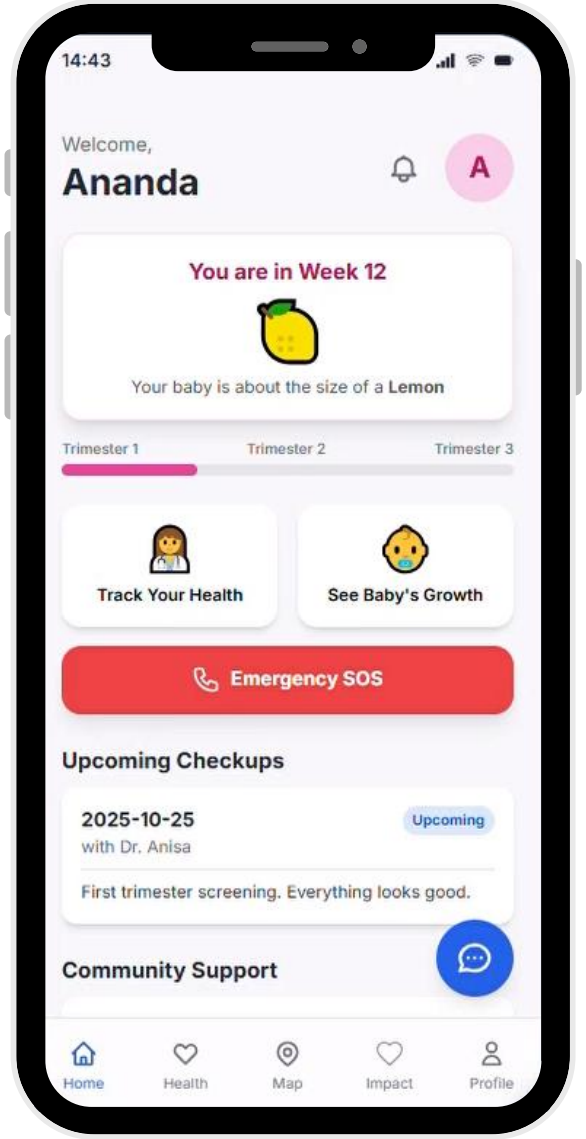


Mode Switch

Scan for App

Pregnancy Mode Features

Scan for App



Pregnancy Mode

- **Health Tracker**
- **Baby Growth Tracker**
- **Emergency SOS**

N.E.X.U.S DRONE SYSTEM

(High-Torque Brushless Motor)
Provides stable lift and precise maneuvering even in rough weather.

(Smart Navigation Arm)
Equipped with sensors for obstacle avoidance and terrain awareness

(SmartCam QR Module)
Ensures only authorized health centers or users can receive the payload.

(Retractable Landing Arms + Delivery Dock)
Foldable design for compactness, doubles as a secure cargo grip.

Connectivity:
4G LTE / LoRaWAN / Wi-Fi / BLE

Security:
End-to-end encryption, secure boot, QR verification

AI Capability:
Onboard computer vision, obstacle detection

Sensors:
Lidar / Ultrasonic / GPS / IMU

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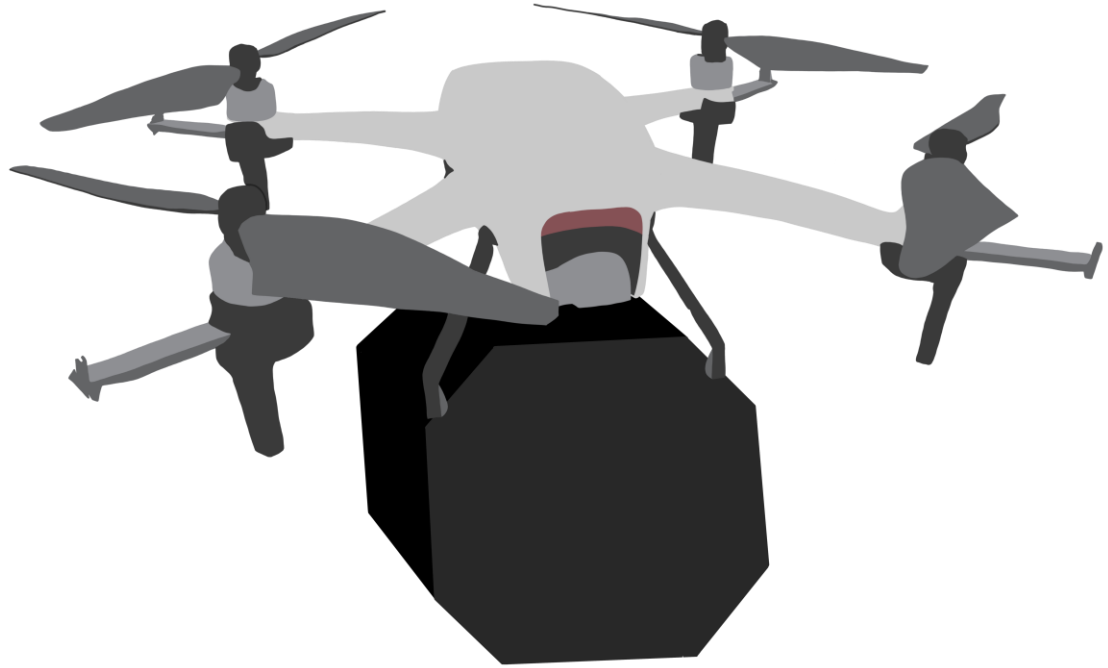
N.E.X.U.S DRONE (WITH PACKAGE)



System

- **Range** up to 15km
- **Payload (Medicine)**: Medical Kits (3 Kg)
- **(Food):**
- Nutrition Packs (4 Kg)
  Speed: 40-60km/h
- Secure delivery with QR code verification

N.E.X.U.S LOCKER SYSTEM

“Precision Delivery for Health. Powered by Intelligence. Guided by Purpose.”

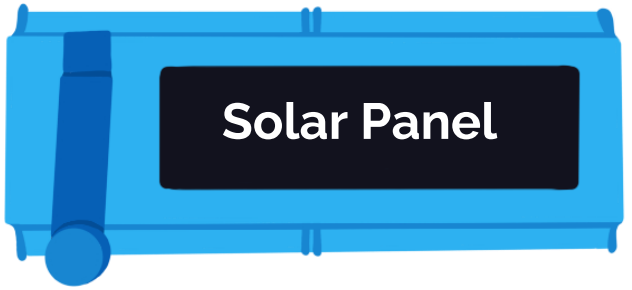
2

IoT

- **QR Code Verification:** Scanned by the onboard camera before package release.
- **Cloud-Connected Delivery Tracking:** Logs delivery location, time, and recipient authentication.
- **Encrypted Locking Protocol:** Ensures package can only be accessed by authorized health officials
- **App/Platform Integration:** Users (recipients or field medics) can receive real-time notifications and status updates.

N.E.X.U.S LOCKER

(AI-Vision Security Hub)
AI-powered CCTV and environmental sensors for total delivery security.



Adaptive Energy System:
A smart hybrid system that prioritizes solar for 60% of its power, supplemented by the grid for guaranteed 100% uptime and reliability in all conditions.

Secure Access Terminal:
High-speed QR scanner and all-weather keypad for flexible, secure access, guided by a clear OLED display for a simple user experience.

(AR-Enhanced Secure Pods)
Climate-controlled, tamper-proof lockers with AR-activated smart locks for verified recipient access.

N.E.X.U.S LOCKER

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Climate-controlled, tamper-proof lockers with AR-activated smart locks for verified recipient access.

N.E.X.U.S Locker & Drone Price List

DRONE(Food Delivery)

- **High-Torque Motors & Frame:** $273 – Rp 4,500.000
- **Sensors (GPS, Lidar, Ultrasonic):** Included Above
- **AI Chip + SmartCam QR System:** $120 - Rp 1,980,000
- **Communication (4G, LoRa):** $60 - Rp 990,000
- **Flight Controller / Navigation Arm:** $70 - Rp 1,155,000
- **Battery, Backup Power:** $150 - Rp 2,475,000
- **Software Encryption & Assembly:** $167 - Rp 2,750,000

Total: $850
Rp 14,000,000 / Unit

DRONE (Medicine)

- **High-Torque Motors & Frame:** $113.85 - Rp 1,850.000
- **Sensors (GPS, Lidar, Ultrasonic):** $58.46 - Rp 950.000
- **AI Chip + SmartCam QR System:** $76.92 - Rp 1,250.000
- **Communication (4G, LoRa):** $40.00 - Rp 650,000
- **Flight Controller / Navigation Arm:** $60.31 - Rp 980,000
- **Battery, Backup Power:** $98.46 - Rp 1,600,000
- **Software Encryption & Assembly:** $116.92 - Rp 1,900,000

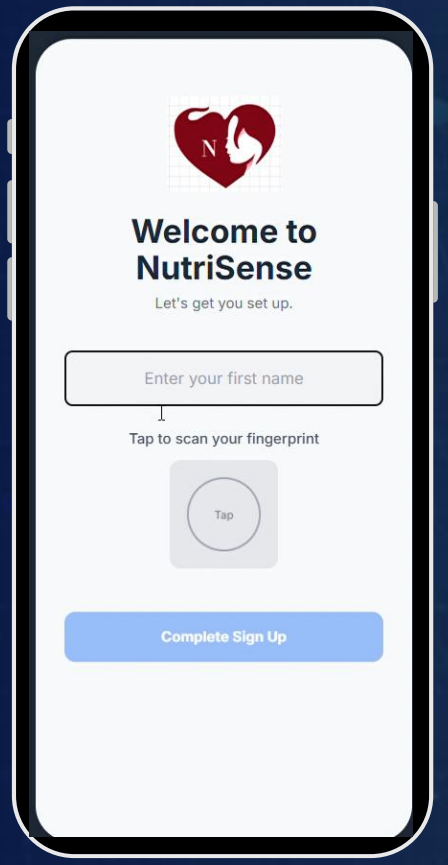
Total: $564.92
Rp 9,180,000 / Unit

LOCKER

- **Locker Frame(metal/anti-rust panels):** $215.38 - Rp 3,500,000
- **Secure Access Terminal (QR Scanner + Keypad):** $123.08 - Rp 2,000,000
- **OLED Display (basic 7” touch):** $49.23 - Rp 800,000
- **Cloud Connectivity Module (Wi-Fi / LoRa):** $73.85 - Rp 1,200,000
- **Encrypted Locking System (mechanical + chip):** $110.77 - Rp 1,800,000
- **Solar Hybrid Power System (60% solar):** $153.85 - Rp 2,500,000
- **AR-Enhanced Lock Pods (basic sensors):** $73.85 - Rp 1,200,000
- **CCTV (AI-lite + motion detection):** $61.54 - Rp 1,000,000
- **Software Integration + Assembly:** $61.54 - Rp 1,000,000

Total: $923.08
Rp 15,000,000 / Unit

CONNECTION BRIDGE



N.E.X.U.S SYSTEM

LOCKER

DRONE

The N.E.X.U.S system acts as a smart bridge between the **Nutrisense** app and real-world delivery tools. After a user consults a doctor, N.E.X.U.S processes the request and chooses the best delivery method—sending items by drone to remote areas or to lockers for easy pickup. This ensures that digital health support turns into real, life-saving action.


DEPLOYMENT
STRATEGY
Where will the system be deployed
Start

N.E.X.U.S Locker Deployment (Urban & Rural)

RURAL AREA

•**Expected Quantity:** 1-2 lockers per village or sub-district.
•**Expected Usage:** Moderate to high impact, serving as a critical access point for remote populations with limited transport.
•**Installation:** Installed at central community hubs such as village halls (*balai desa*), community health centers (*puskesmas*), or local schools.
•**Our Focus:** A hybrid model combining locker pickup with scheduled distribution by community health workers. Drone delivery will be prioritized for urgent medical needs and geographically isolated households.
•**Powered by solar panels and a backup battery system** for reliable offline operation and connected via a cellular network for periodic syncing.

URBAN AREA

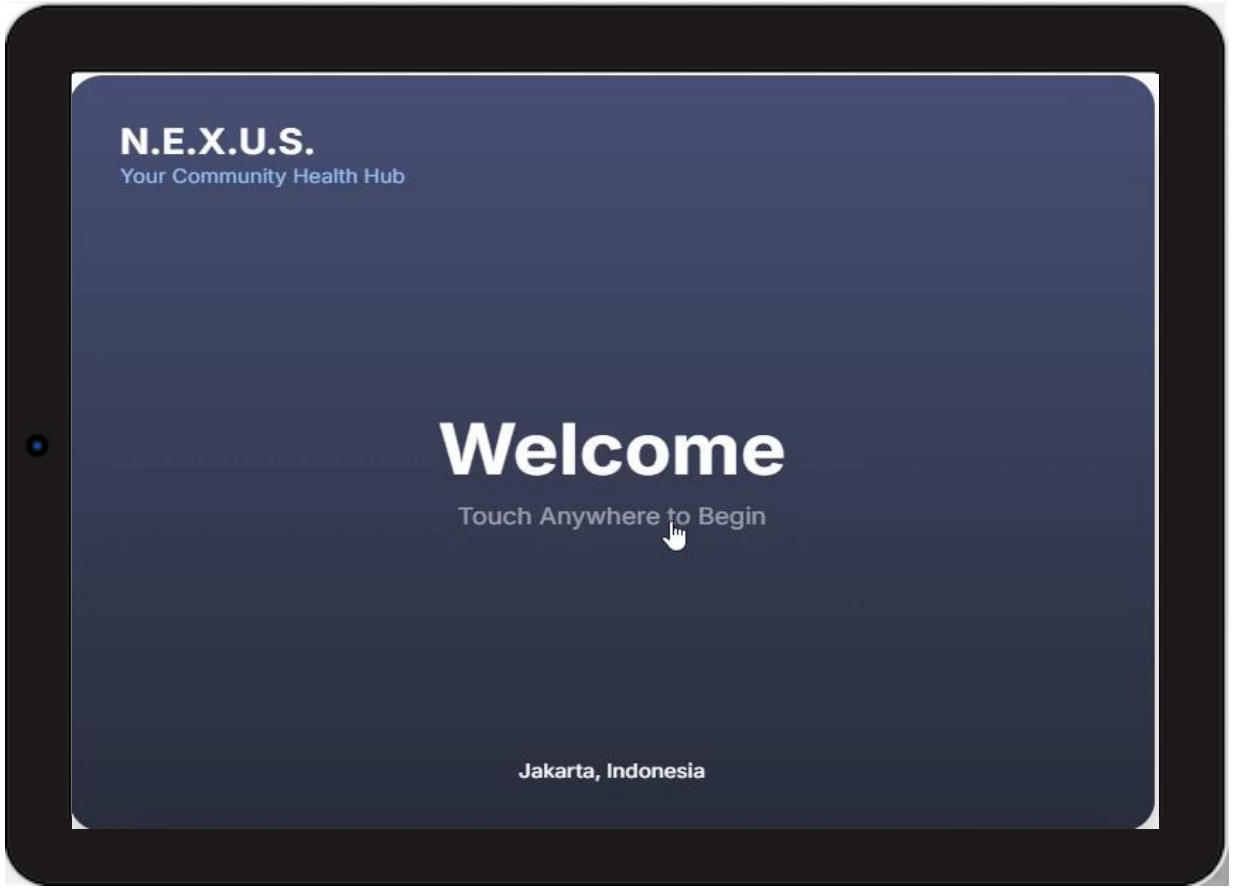
- **Expected Quantity:** 10–15 lockers (1 per neighborhood)
- **Expected Usage:** High usage due to walkability and easy transport
- **Installation:** Installed in supermarkets, schools, or clinics
- **Our Focus:** More locker pickup, less home delivery. Drone use in emergencies, disabilities, or late-night
- **Powered by local electricity and cloud-connected for real-time access**

NEXUS Locker tablet (Urban AREA)

N.E.X.U.S URBAN Area UI

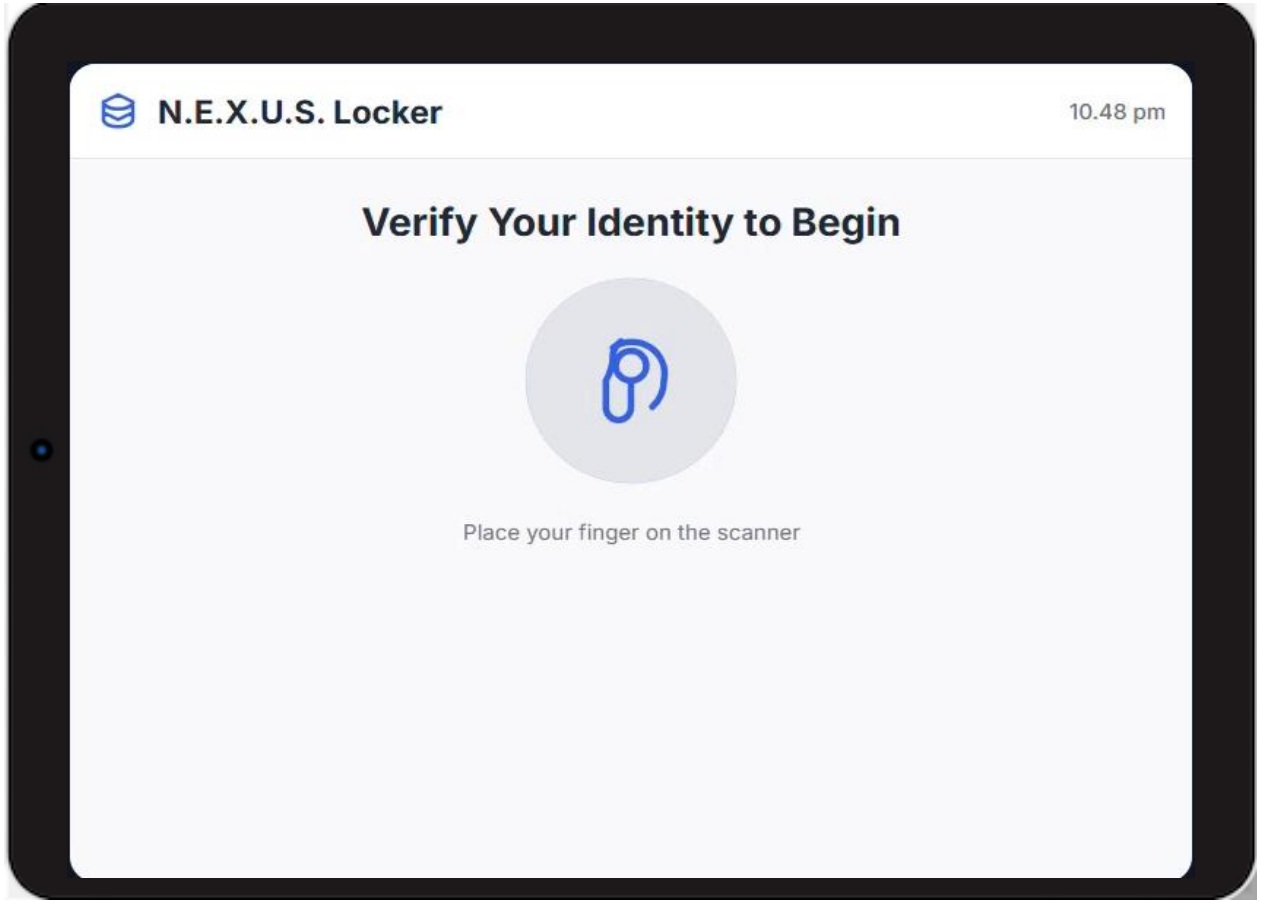
- **Step 1: Welcome Page:** The user is greeted by the N.E.X.U.S. welcome screen and touches anywhere to begin the process.
- **Step 2: Identity Page:** To proceed, the user is prompted to verify their identity by scanning their fingerprint.
- **Step 3: Home Page (Health Hub):** After successful verification, the user lands on their personalized Health Hub, which provides access to all the main features, such as consulting a doctor, viewing their health records, and picking up medicine.

(The reason why we used fingerprint is since everybody has a unique fingerprint it will enable them to have a personal experience)*



NEXUS Locker tablet

(RURAL AREA)



(The reason why we used fingerprint is since everybody has a unique fingerprint it will enable them to have a personal experience)*

N.E.X.U.S Rural Area UI

- **Step 1: Verify Page:** The user is prompted to scan their fingerprint to begin.
- **Step 2: Home Page:** A main menu appears, offering options to "Consult a Doctor" or "Take Your Medicine."
- **Step 3: Pin Pickup Page:** The user must enter their unique 4-digit PIN to proceed with pickup.
- **Step 4: Fingerprint Verification Page:** A final fingerprint scan is required to confirm identity before the locker opens.
- **Step 5: Successful Verification Page:** A confirmation screen appears, announcing that the locker is open.

N.E.X.U.S Drone Deployment (Urban & Rural)

RURAL AREA

- **Expected Quantity:** 3–4 drones (2 per 3–4 villages)
- **Expected Usage:** Used for regular, scheduled deliveries to remote or underserved areas with limited healthcare access
- **Installation:** Ideal for traffic-congested or hard-to-access areas
- **Installation:** Best for isolated regions with poor road infrastructure or disaster-prone zones
- **Operated with GPS tracking and semi-automated dispatch via satellite or offline syncing**
- **Medicine & Nutrition Package Delivery:** Drones deliver both essential medicine and nutrition kits from health outposts or central rural depots

URBAN AREA

- **Expected Quantity:** 1 per 2 districts
- **Expected Usage:** Used for urgent or time-sensitive deliveries
- **Installation:** Ideal for traffic-congested or hard-to-access areas
- **Operated with GPS tracking and automated dispatch from a central hub**
- **Medicine Retrieving:** Drones pick up medicine directly from partner pharmacies

OFFLINE (RURAL AREA)

NUTRIPOST

NutriPost is a rural health outpost providing essential medical care and nutrition support in rural areas without internet or electricity.

Key Services:

- **Doctor/midwife consultations**
- **Free basic medicines**
- **Nutrition packages & health education**
- **Child growth monitoring**
- **Locally sourced food (supporting farmers)**
- **Solar-powered/manual operation**
- **NEXUS Lockers (Online Consultations & Medicine)**

Designed for offline areas, it delivers healthcare while strengthening local communities.

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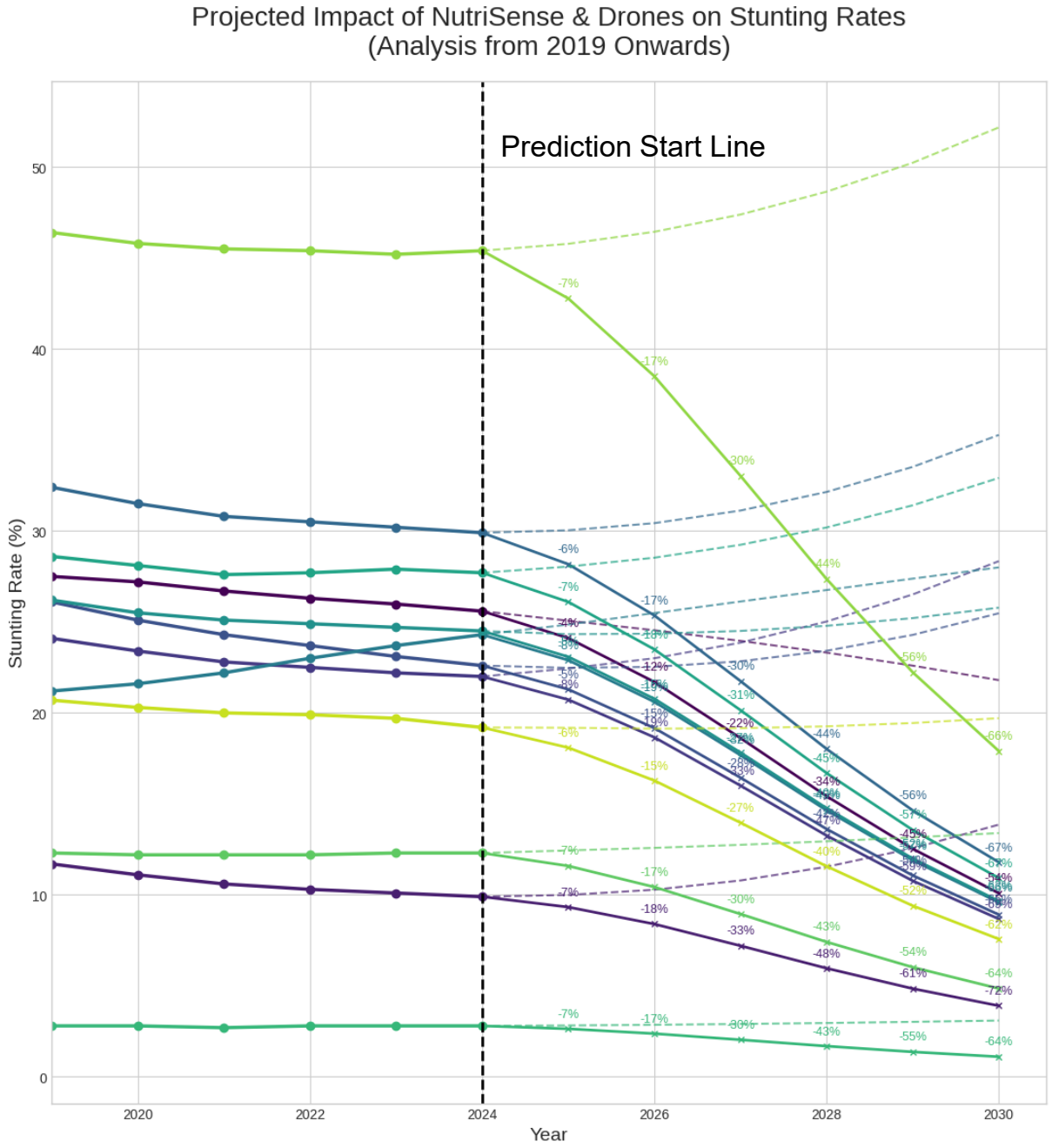
NutriPost
Veo

Stunting Rate Projections With NutriSense & N.E.X.U.S. (Google Colab)



Reduction Percentage

Indonesia: **-46.12%**

Philippines: **-32.74%**

Viet Nam: **-26.69%**

Thailand: **-22.86%**

Myanmar: **-37.04%**

Malaysia: **-24.36%**

Cambodia: **-35.03%**

Lao PDR: **-37.52%**

Singapore: **-15.34%**

Brunei Darussalam: **-20.67%**

Reduction Graph

This graph shows possible reduction in stunting through the impact of Nutrisense and N.E.X.U.S. system. The highest projected reduction is at **46.12%.**

Projected Impact
Historical data
Predicted data

(Reduction Code)(Google Collab)

```
PLOT_START_YEAR = 2019
INTERVENTION_START_YEAR = 2025
LOGISTIC_MIDPOINT_YEAR = INTERVENTION_START_YEAR + 2
LOGISTIC_STEEPNESS = 0.9
MAX_ANNUAL_REDUCTION_EFFECT = 0.20

def logistic_reduction_factor(year):
    if year < INTERVENTION_START_YEAR:
        return 0
    return 1 / (1 + np.exp(-LOGISTIC_STEEPNESS * (year - LOGISTIC_MIDPOINT_YEAR)))
```

NutriSense Business Model and Sustainability

Key partners

- Government health departments (e.g. Kemenkes RI)
- Local and ASEAN-level NGOs (UNICEF, WHO)
- Hospitals and pediatricians
- Drone tech companies
- Local farmers & food co-ops
- Nutritionists and dietitians
- Universities & research centers

Activities

- App development & AI model training
- Collecting and analyzing stunting data
- Managing doctor consultations through app
- Drone delivery route planning and refills
- Stocking and maintaining smart lockers
- Curating food recipes based on local ingredients

Key resources

Key resources

- Mobile app with AI and health database
- Stunting prediction model (trained from ASEAN data)
- Drone fleet with insulated delivery boxes
- Smart medicine lockers with QR code access
- Doctors and nutritionist partnerships
- UI/UX optimized for low-literacy users
- Cloud hosting and offline-first design

Value props

- Real-time stunting heatmap by area
- In-app doctor consultation for child health
- Food recommendations based on local/home ingredients (Computer vision & AI)
- Drone delivery of medicine and supplements
- Smart lockers for secure 24/7 medicine access
- Reduces delays and ensures access in rural areas

Customer relationships

- Continuous support via app chat/AI assistant
- Family-focused health education campaigns
- Transparent updates and result tracking
- Feedback-based feature updates

Channels

- Google Play & App Store
- School & Posyandu outreach
- Government health portals
- WhatsApp broadcast and village groups
- Flyers/posters in rural clinics
- Smart lockers placed at schools, clinics, or village halls

Customer segments

- Rural families with children under 5
- Local clinics and midwives
- Public health officers
- NGOs and government health programs

Cost structures

- Development and maintenance of app + AI models
- Drone operations and refueling
- Smart locker installation and stocking
- Professional fees for doctors/dietitians
- Training community health agents
- Awareness campaigns (online and offline)

Revenue streams

- Government and NGO funding (grants, CSR)
- Health program subscriptions for rural districts (through Health Center)
- Sponsorships from health/food brands (in collaboration with Health Center)
- Paid consultations (optional)
- Data insights for health research
- Strategic partnerships with pharmacies & food companies

NutriSense & N.E.X.U.S.

Implementation Plan

YEAR 1 Foundation & Prototyping →

User & Security Needs
Interview health workers, and clinic staff to understand requirements.
Identify security risks and ensure compliance with Indonesian privacy laws (PDP).

Design & Testing
Create a secure app and locker system architecture.
Develop and test easy-to-use prototypes.

Build & Secure
Build a working prototype with key features.
Set secure coding rules and scan code for vulnerabilities early.

Data Planning
Use health data to pick pilot locations.
Define rules for managing and protecting data.

YEAR 2 Development & Pilot Deployment →

Automate Builds & Security
Set up a CI/CD pipeline for automated testing and deployment.
Add security scans to catch vulnerabilities early.

Build App & AI
Finish mobile app development (frontend + backend).
Train the AI symptom checker, keeping data and models secure.

Deploy Secure Lockers
Use Infrastructure as Code (IaC) to deploy locker network.
Protect all app-locker API connections.

Test for Security Risks
Run dynamic scans (DAST), check third-party code (SCA), and conduct penetration testing before launch.

Final User Testing
Pilot group tests the system, giving feedback on usability and security.

YEAR 3 Partnerships & Service Integration →

Partnerships & Security Checks
Partner with government (Ministry of Health, BKKBN) and corporations.
Assess third-party security risks for data safety.

Supply Chain Setup
Integrate nutrition/medical suppliers securely via APIs.
Define private data-sharing agreements.

Scale to New Provinces
Expand to 2 high-need provinces using automated, secure deployment.

YEAR 4 Development & Pilot Deployment

Community Engagement
Train and deploy local agents (*Duta NutriSense*) to onboard rural users and provide support.

Awareness Campaigns
Run marketing and health campaigns to boost adoption and educate users.

ASEAN Expansion Prep
Start planning expansion to a neighboring country, checking local data and healthcare laws.

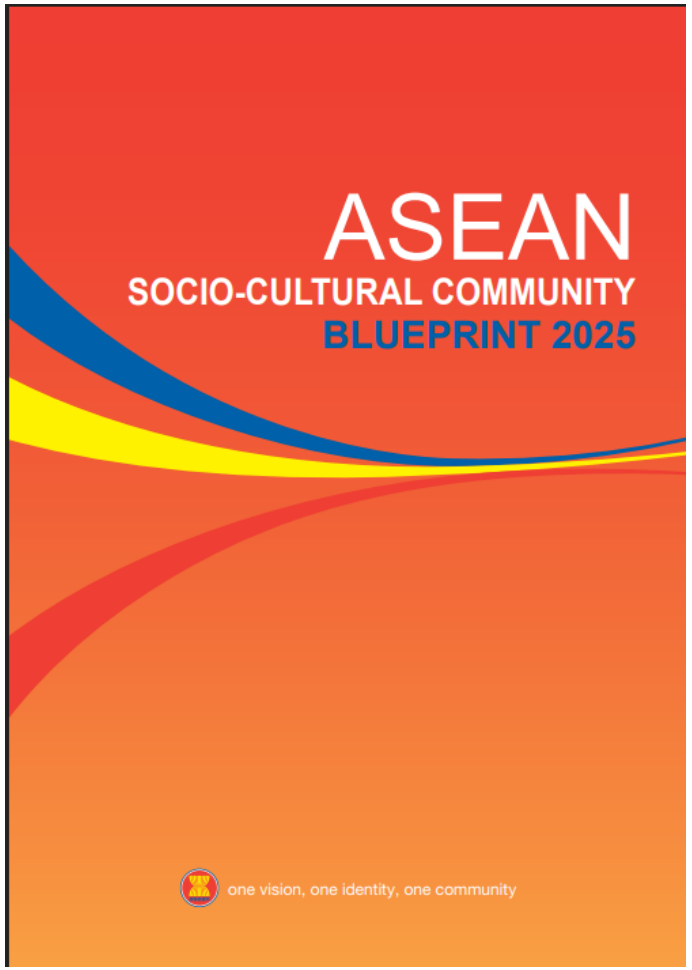
Security & Improvement
Set up 24/7 security monitoring (SIEM) and an incident response plan.
Continuously improve security and features using DevOps feedback.

Risk Management

Risk Category	Risk Description	Likelihood	Impact	Mitigation Strategy
Operational	**Locker Vandalism or Tampering:** Physical damage to N.E.X.U.S. Lockers in public, unsupervised locations.	Medium	High	- Install lockers in visible, trusted community hubs (e.g., balai desa, puskesmas). - Use durable, tamper-resistant materials for construction. - Engage community leaders to foster a sense of local ownership and oversight.
	Power & Network Failure: Unreliable electricity and cellular connectivity in remote rural areas affecting locker operation and data syncing.	High	High	- Equip all rural lockers with solar panels and high-capacity backup battery systems. - Design the system for robust offline functionality, with data syncing periodically when a connection is available.
	Supply Chain Disruption: Delays or failures in stocking the lockers with necessary nutritional packages and medical supplies.	Medium	High	- Diversify suppliers for key items. - Implement an inventory management system with automated low-stock alerts. - Establish local storage depots for buffer stock in each operational region.
Strategic	**Low User Adoption:** Target users (mothers, health workers) do not trust or understand the technology, leading to low engagement.	High	High	- Deploy trained community agents (Duta NutriSense) to conduct hands-on training and build trust. - Ensure the app interface is highly intuitive, localized (Bahasa Indonesia), and requires minimal technical literacy. - Secure endorsements from local community and religious leaders.
	Failure to Secure Partnerships: Inability to form necessary partnerships with government health bodies or corporate CSR programs for funding and integration.	Medium	High	- Develop a clear value proposition for each potential partner, highlighting social impact and public health benefits. - Start with a successful, well-documented pilot project to demonstrate effectiveness and build a strong case for larger-scale collaboration.
Financial	**Insufficient Funding for Scaling:** Initial funding is insufficient to cover the costs of manufacturing, deployment, and operation as the network expands.	Medium	High	- Create a multi-faceted funding strategy combining government grants, corporate CSR partnerships, and potentially a subscription model for premium features or partner NGOs. - Develop a phased rollout plan that aligns with secured funding tranches.
Compliance & Legal	**Data Privacy Violation:** Non-compliance with Indonesia's Personal Data Protection (PDP) law regarding the handling of sensitive user health information.	Low	High	- Conduct a full Data Protection Impact Assessment (DPIA). - Implement end-to-end encryption for all user data. - Anonymize data used for analytics and ensure user consent is explicitly obtained for all data collection.
	Medical Liability: The AI Symptom Checker provides incorrect guidance, leading to adverse health outcomes.	Medium	High	- Prominently display disclaimers stating the AI is not a substitute for professional medical advice. - Program the AI to err on the side of caution, escalating any potentially serious symptoms directly to the "Consult a Doctor" feature. - Maintain comprehensive liability insurance.

NutriSense Solutions

Aligned ASEAN Blueprints



Strategic Theme:
"An ASEAN Community that engages and benefits the peoples and is inclusive, sustainable, resilient, and dynamic."
ASCC 2025 is envisioned to build:

- An inclusive community that promotes high quality of life and equitable access to opportunities for all.
- A resilient community with enhanced capacity to respond to social vulnerabilities, disasters, and emerging threats.
- A dynamic community with a strengthened ability to innovate and proactively contribute to the global community.

NutriSense Platform Blueprint:

- **Inclusive:** Promotes "equitable access for all" to healthcare through its AI Symptom Checker, direct doctor consultations, and nutritional guidance. The donation and health outpost features specifically support and protect vulnerable children in remote areas.
- **Resilient:** Builds community resilience through its Disaster Mode and the N.E.X.U.S. Locker system, ensuring access to food and medicine during crises.
- **Dynamic:** Fosters an adaptive ASEAN through gamified "Learn & Earn" modules and a community forum that encourage lifelong learning and social responsibility.

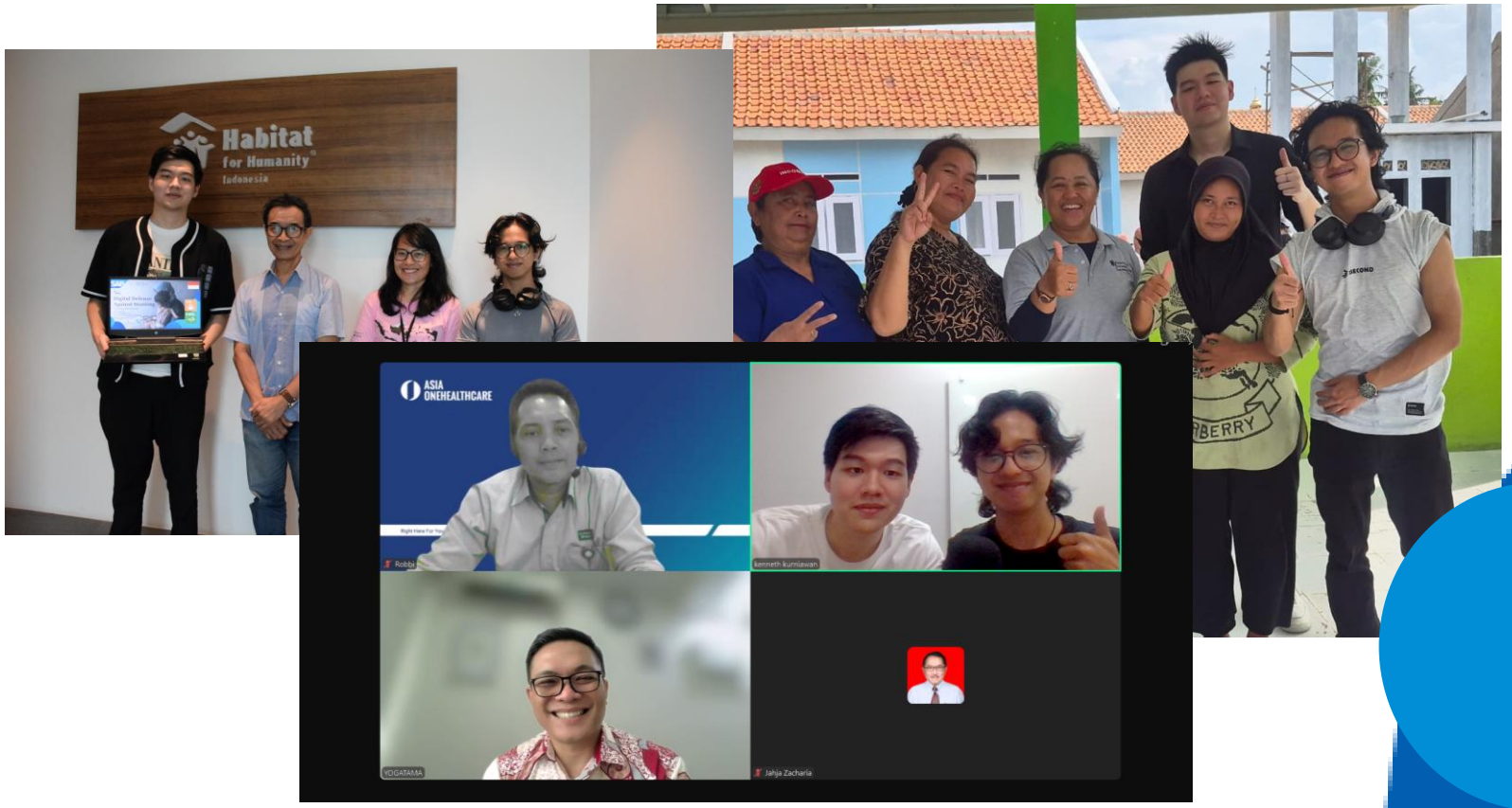
In Partnership With:

Habitat for Humanity

RS Premier Jatinegara

Our Professional Consultants

As to fully realize our project's potential, we got in touch with multiple professionals out on the field. This included pediatricians from our local hospital and a local NGO dealing with poverty. We got:



Integration with Existing Government Systems (SATUSEHAT)

Become Leading Force of Stunting Prevention in Indonesia with Government and NGO Collaboration

Collaboration Opportunities and Case Study Area with Habitat for Humanity


THANK YOU

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