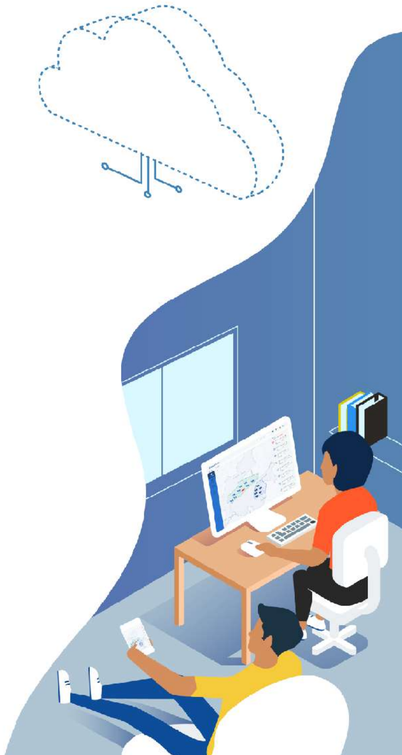
DYCODEX

SMARTernak

We’re here to improve livestock farming!



In 10 years

8.5 Billion

Human in planet Earth

Production needed

1.2 Billion

Tons of milk

400 Million

Tons of meat*

From

1.8 Billion

Cattle*

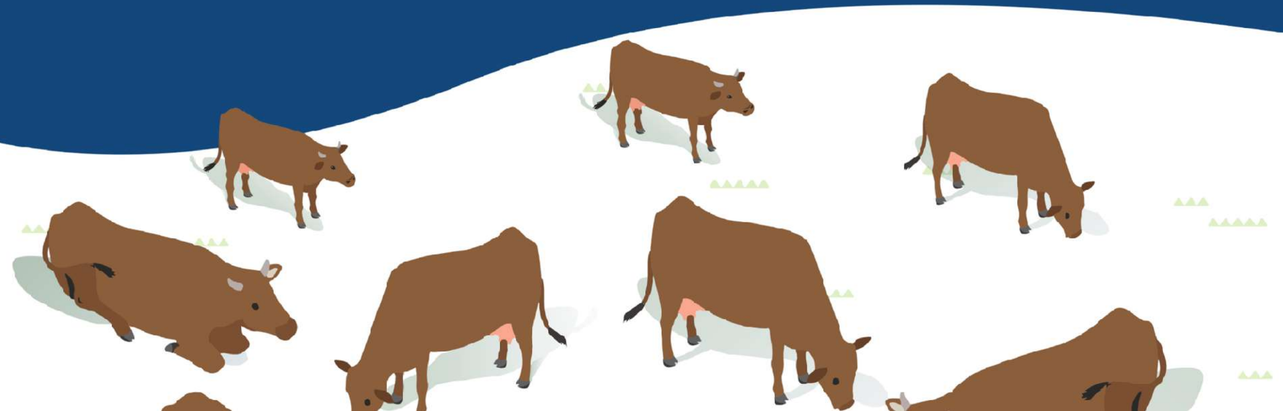
Food & Agriculture Organization

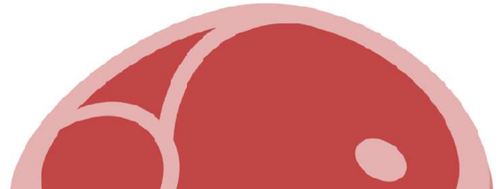
"Livestock sector is one of the **fastest growing** parts of the agricultural economy, contributing **40%** of the global value of agricultural output and support the food security of **1.3 billion people**"

"Indonesia will be self-sufficient in beef in the next **10 years**"

- Circa 2016

Ir. Joko Widodo, President of Indonesia





*FAO

Cattle farming still has real world problems

"We have no reliable way to track **feeding behaviour**. Non-eating cows are often found dead after 2-3 days."

A personal farm, Subang - Indonesia
Manages **400+** cows

HERD COUNTING

"We often **lose count** when a herd of cows moves between grazing areas"

A corporate farm, Indonesia, manages **8000+** cows

OPERATION EFFICIENCY

"We have to **visit hundreds of cows every day**, just to check if they still move. **Active cows** are the **best breed**"

Cattle Breeding Centre - Ministry of Agriculture
Manages **1400+** cows

FOOD SECURITY & TECH

"We have **no reliable data** to answer a simple question, can we feed the nation?"

"The best monitoring **technology** deployed in Indonesia is still RFID-based ear tag"

Ministry of Agriculture, Indonesia

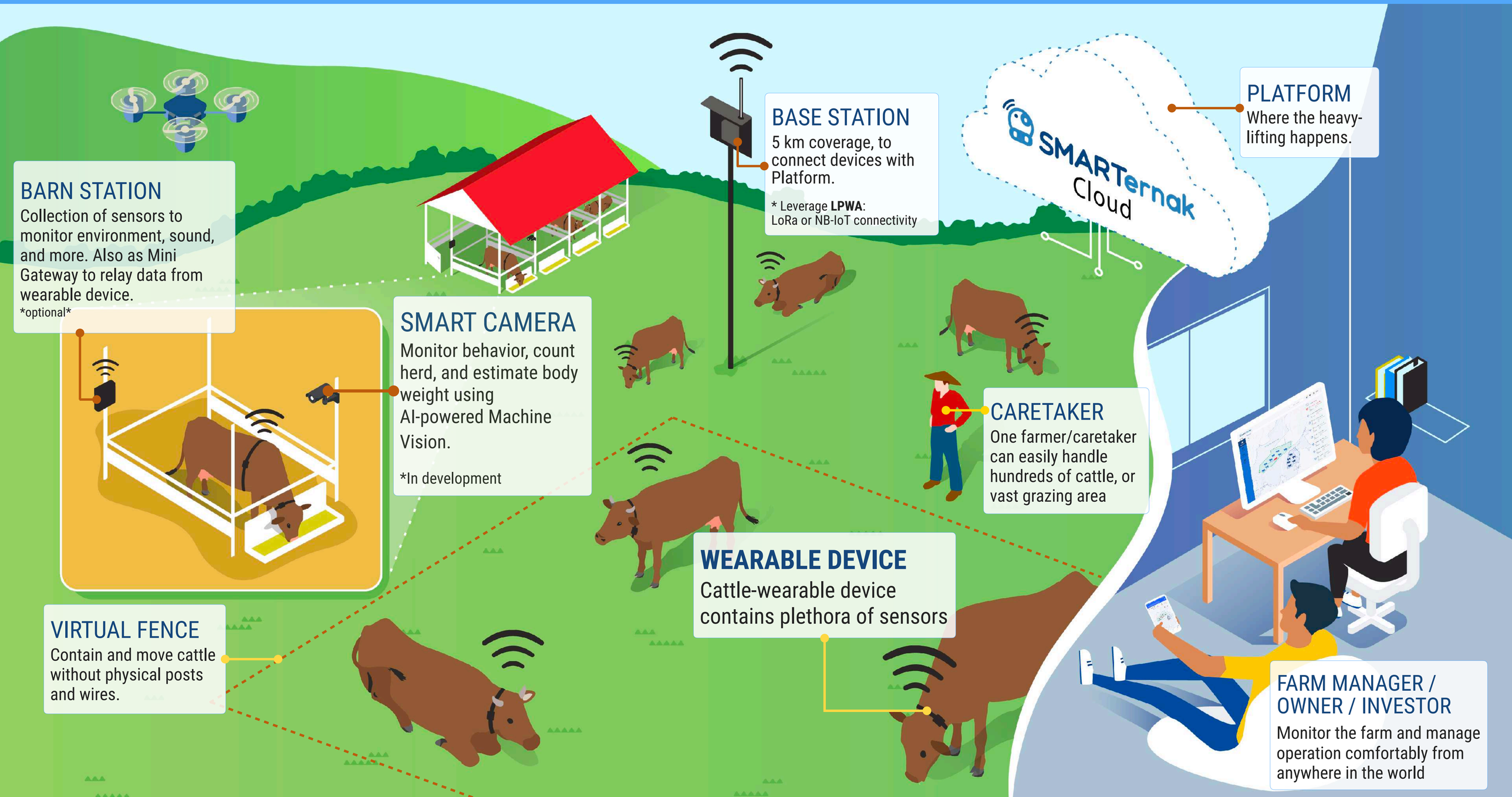
So, introducing...

SMARTernak

Internet of Things & Artificial Intelligence-powered Livestock-Farm Assistance Platform

* “Ternak” in SMARTernak means “livestock” in Bahasa Indonesia

SMARTernak: High Level View



Cattle-wearable Device

Dual IoT Connectivity

Short Range: Bluetooth v5, BLE
Long Range options: **LoRa/LoRaWAN** or **NB-IoT,**
for 5 km coverage area

Powerhouse

Ultra low power Microcontroller
with on-device Machine Learning capability

Packed with Sensors

GPS / GNSS
Accelerometer, Gyroscope
Body Temperature
Ambient Temperature & Humidity
Barometric Pressure
Heart Rate*
Device Removal Detector
Magnetic User Button

Smart Energy

Solar Energy Harvesting*

Battery Gauge

Firmware-optimised
Ultra Low Power Consumption

Actuators

Buzzer Audio Alert
Color LED

Enclosure

Waterproof & submersible (IP67)
“Breathable” ventilation

**Hardware is 100% designed in-house,
We can customize it for your use cases.**

* Optional

Monitoring & Insights

Monitor cattle where-about & well-being

Provide insights - powered by AI

farmer doesn't really care about (raw) data

Barn Sensors:

Monitor ambient temperature, humidity, sounds, or air quality in barn

Monitor food & water level

On-farm Smart Camera:

Monitor activity up to 5 cattle

Count herd & movement

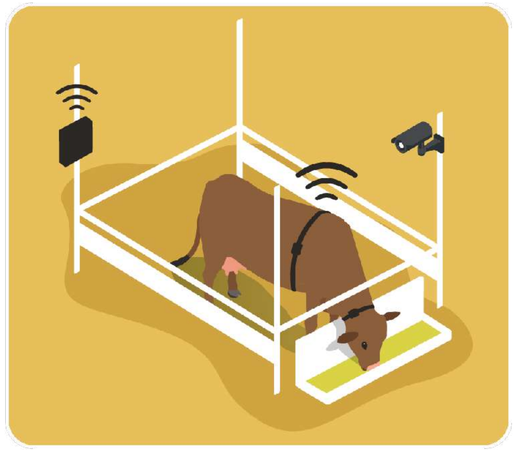
Cattle-wearable device:

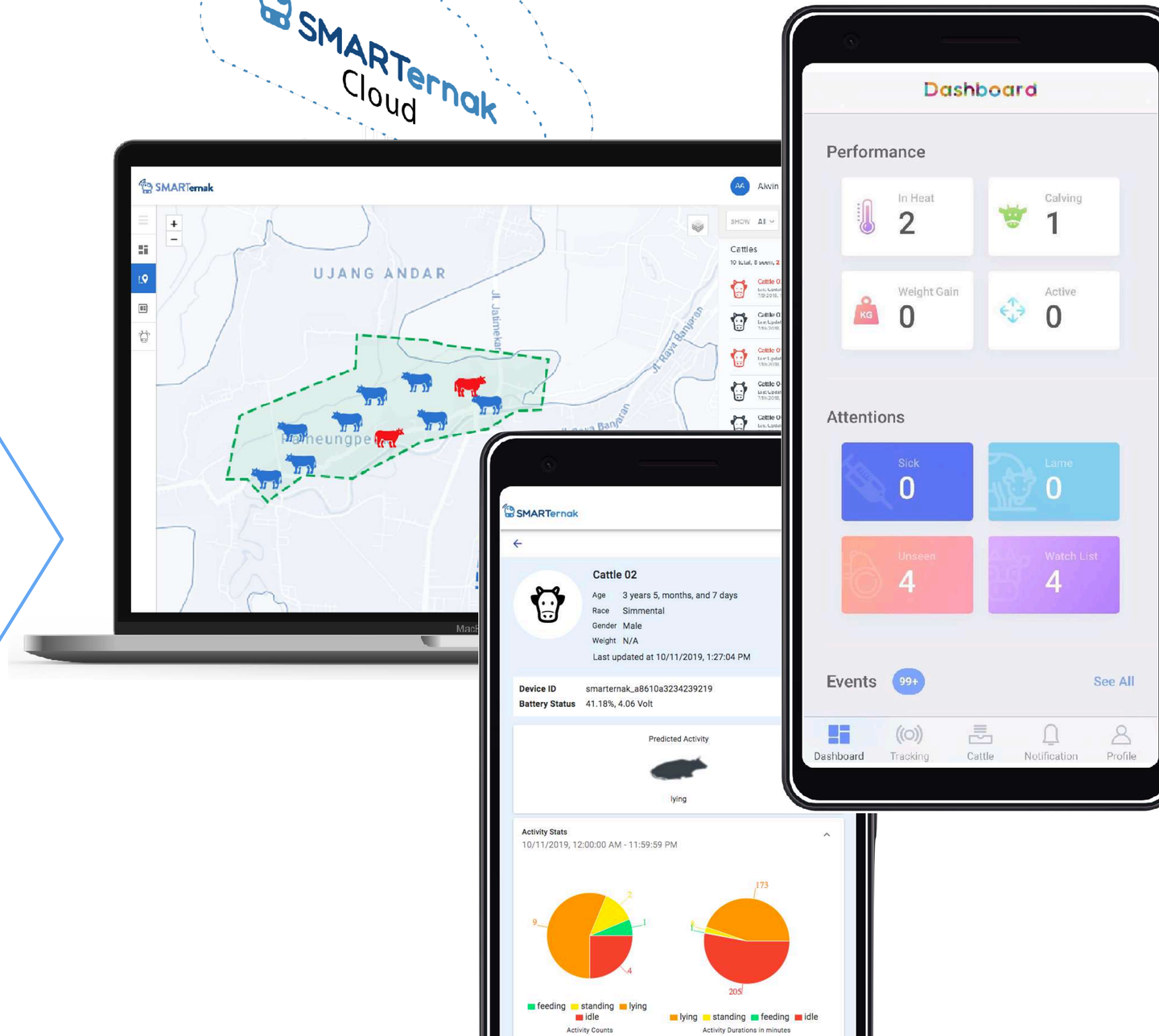
Precisely monitor cattle's: location, movement, body temperature, and heart rate, device removal

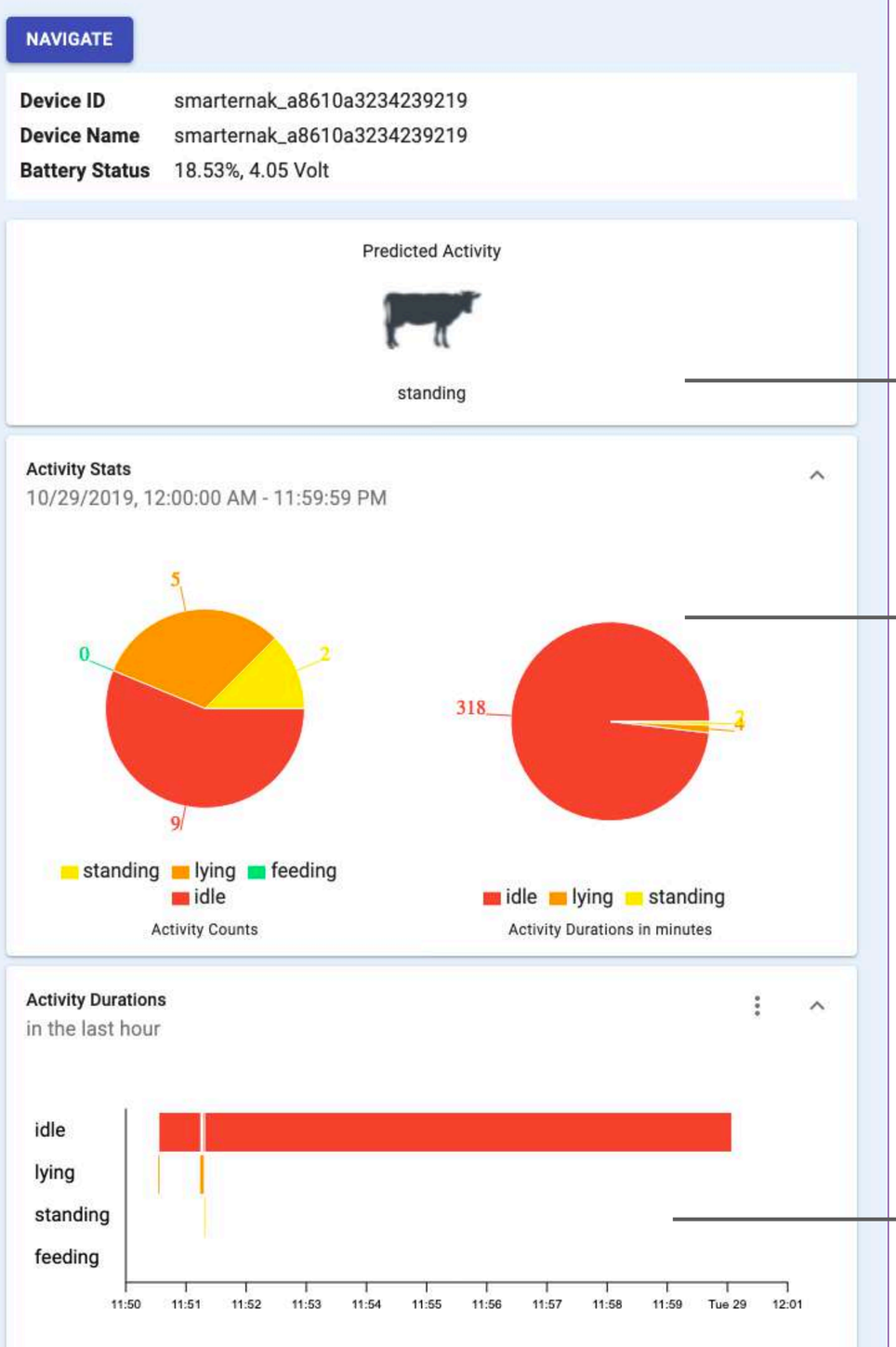
Estimate cattle weight

Predict cattle's activity

Ambient temperature & humidity







Cattle Activity Insights

Leveraging **On-device Machine Learning** to **predict cattle's activity.**
To tailor **Activity Insights & Recommendation**

Animal activity recognition

No need to visually observe the animal activity

Activity stats

Activity count and duration statistic during certain timespan

Activity duration & switching

Can be used for determining symptoms of possible health issues.

Alert when animal has stopped moving, not feeding, not enough activity, and more

What We Have Now

Product is ready to scale up!

100+
Deployed

500+
In Pipeline

Local implementations:

KEMENTERIAN PERTANIAN

JABAR DIGITAL SERVICE

MOOSA

goopo

…and local farms in Bogor, Subang, and Majalengka city

International leads:

axiata

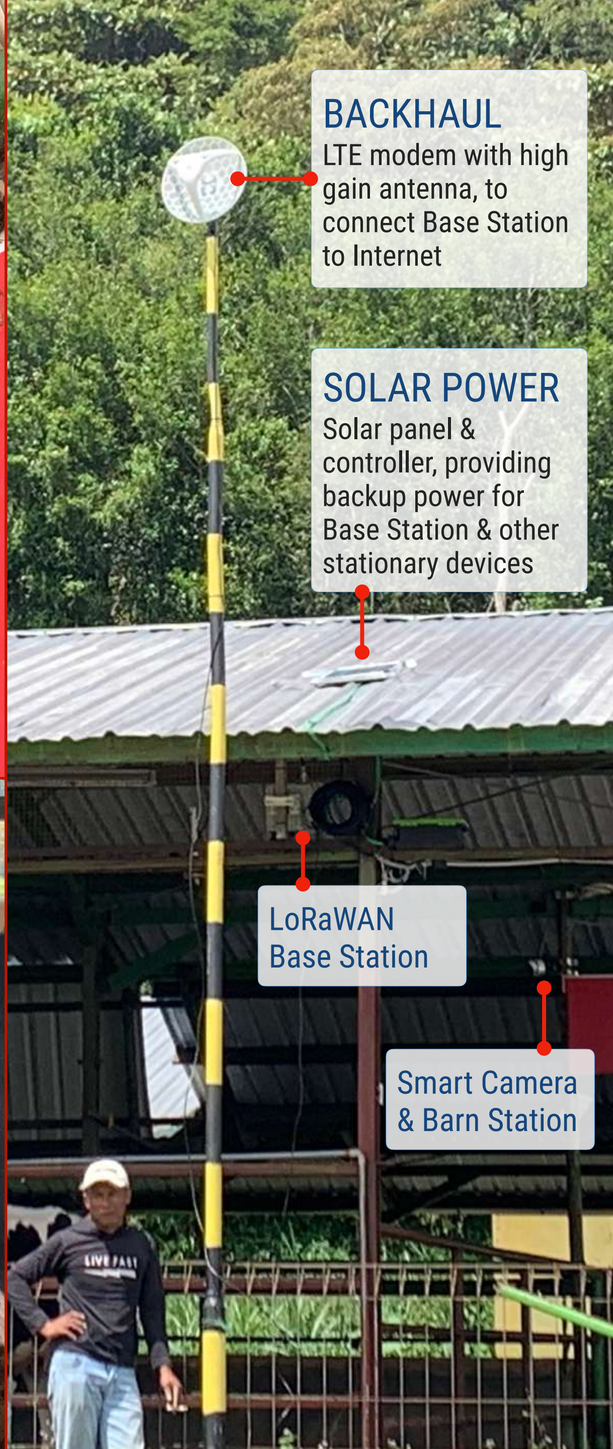
viettel
Hãy nói theo cách của bạn

SFR

…and some partners in South Africa, India, Dubai

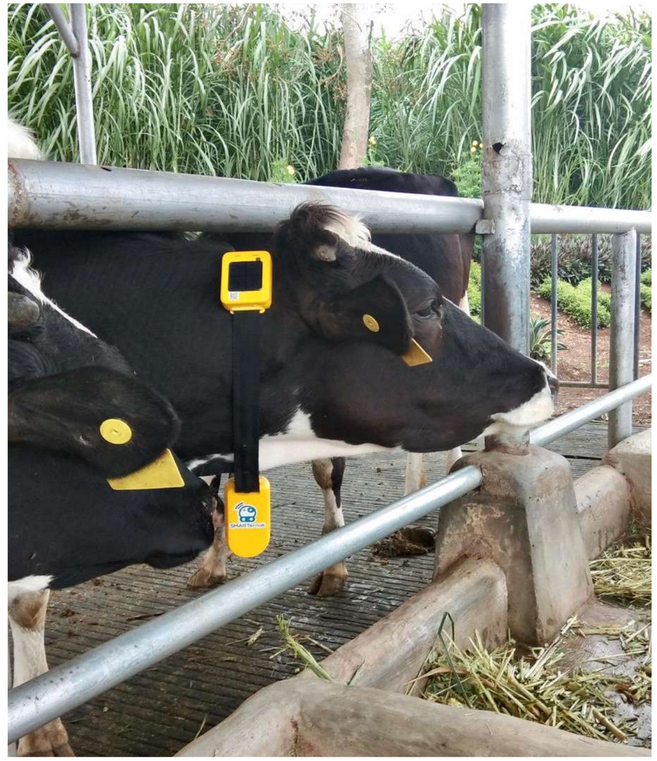
SMARTernak
Real-World
Implementation

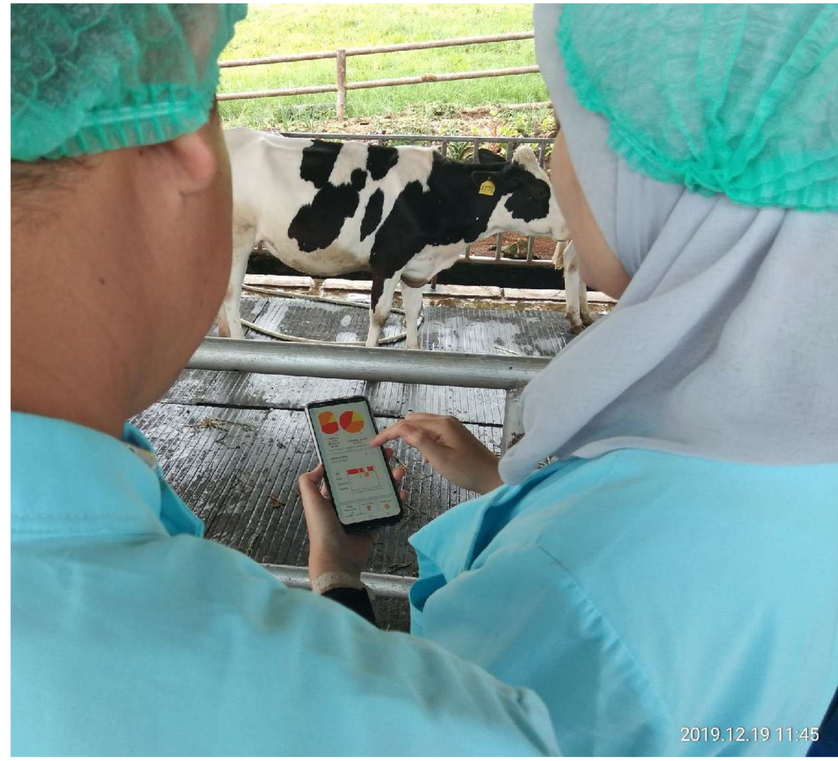
@ Moosa EduFarm, West Sumatera
Circa Dec 2021



BPPIBTSP Bunikasih, West Java Government

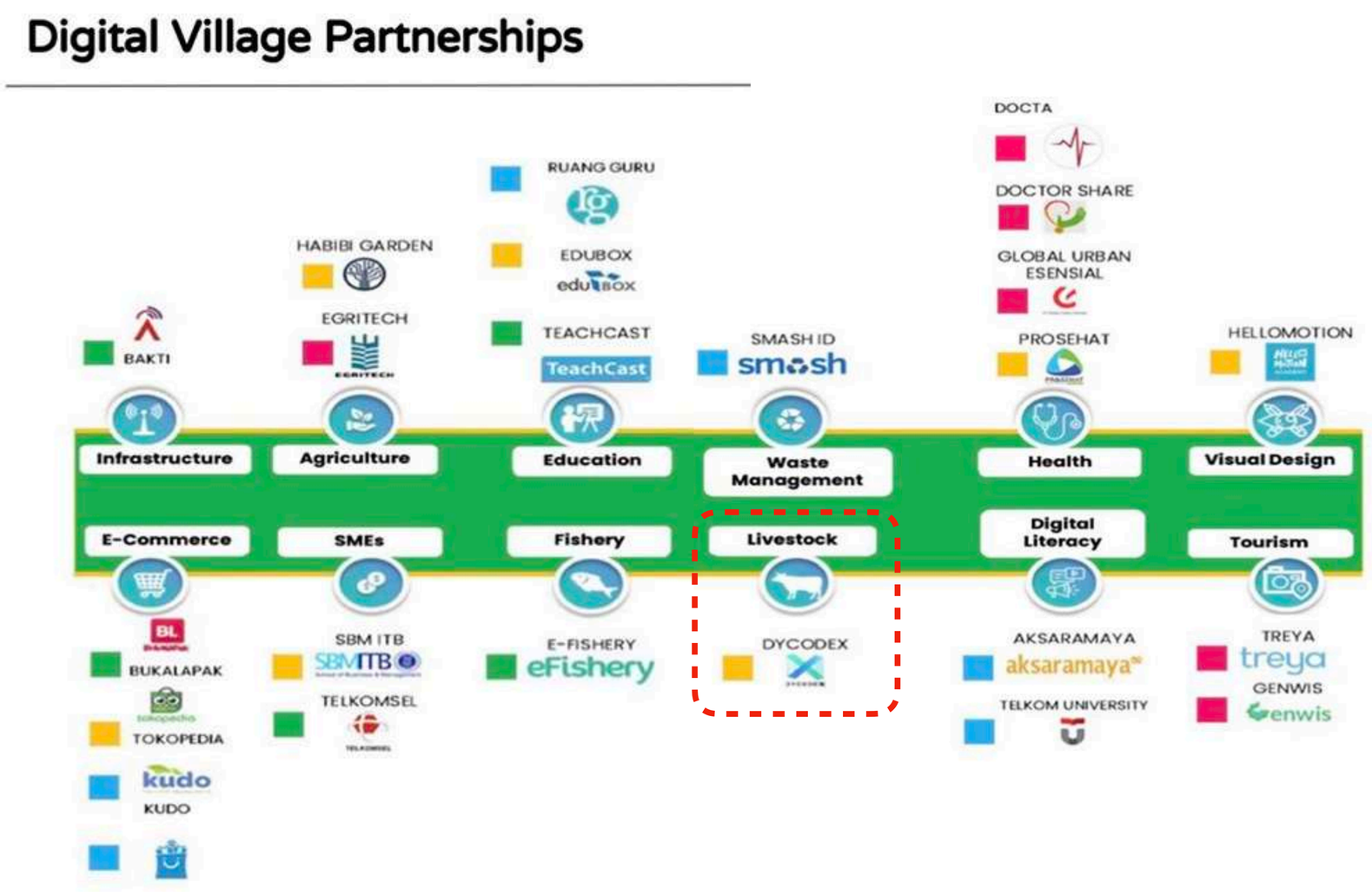
in Cianjur, West Java, Indonesia, Dec 2019
in collaboration with **XL Axiata** for 1st implementation of
Desa Digital (Digital Village Program) for Livestock





Digital Village Program - West Java Province

Working with Jabar Digital Service (JDS) of West Java Government



* Images were retrieved from Mr. Ridwan Kamil's (West Java Governor) Instagram Post

Featured in GSMA's IoT Case Studies in Asia-Pacific

Download here: https://www.gsma.com/iot/resources/iot-case-studies-apac2020/

Internet of Things Case Studies

LEADING THE WORLD OF INNOVATION
IN ASIA-PACIFIC

5G | LTE-M | NB-IoT

FEBRUARY 2020

HELPING LIVESTOCK FARMERS BECOME MORE PRODUCTIVE - **DYCODEX**

Operator partner: XL Axiata • **Technologies:** Artificial intelligence & NB-IoT • **Country:** Indonesia

MAKING CATTLE FARMING MORE EFFICIENT

Cattle farming in developing countries is mostly still a manual process that relies heavily on instinct, rather than actual data. As a result, farmers can be late in detecting potential disease and stress in their animals or the oestrous cycle for successful breeding, while the food and water supply is rarely optimised. They also rely on fences to prevent loss and theft of cattle, while animals generally have to be counted manually by someone in the field.

These inefficient practices could be addressed through the introduction of precision livestock farming, based on real-time data, which can be used to increase yield and reduce losses. Indonesia-based start-up DycodeX has developed SMARTernak, an IoT solution that uses artificial intelligence (AI), to assist cattle farmers. XL Axiata's low power wide area NB-IoT network connects devices worn by the cattle with the cloud, where the SMARTernak AI continuously tracks the animals' behaviour, delivers insights, and recommends actions to the farmer via a smartphone app or web-based dashboard.

The compact SMARTernak cattle-wearable devices, which have solar cells to harvest energy, contain a GPS chip and sensors that can monitor the cattle's body temperature and activity levels. As well as indicating the health of the animal, this data can be used to determine how active it is and how much it is feeding, and when is the optimum time for insemination. Moreover, a built-in anti-theft system means SMARTernak will notify the farm owner or caretaker if the device is stolen or removed from their cattle without permission.

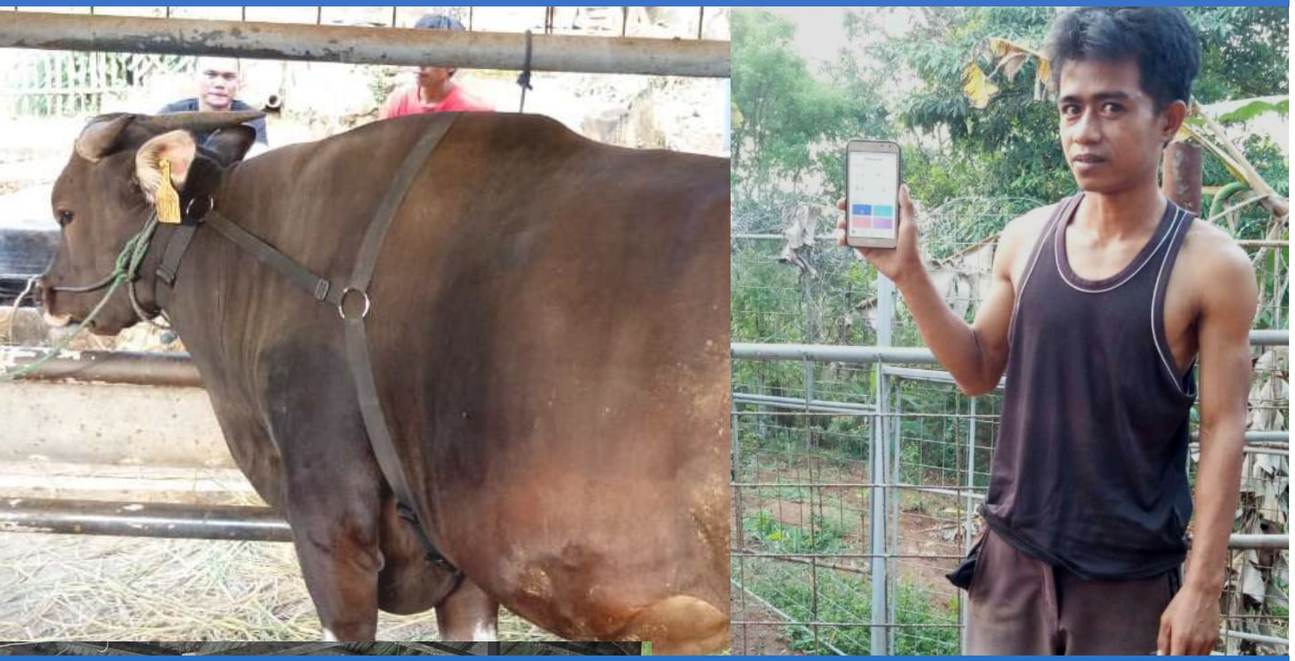
REAL-WORLD DEPLOYMENT – PILOT PROJECTS IN CATTLE FARMS IN WEST JAVA, INDONESIA

Supported by the Desa Digital (Digital Village) programme run by the government of West Java Province, DycodeX has tested its SMARTernak product in the field. The initial pilot involved a medium-size farm in the Majalengka region of West Java. The primary objective was to test NB-IoT connectivity. It found that an existing LTE base station using 900MHz spectrum could provide reliable coverage over a 3km radius, which is sufficient to cover the entire farm. The pilot confirmed that the SMARTernak wearable device was able to transmit and receive data via NB-IoT without any significant issues.

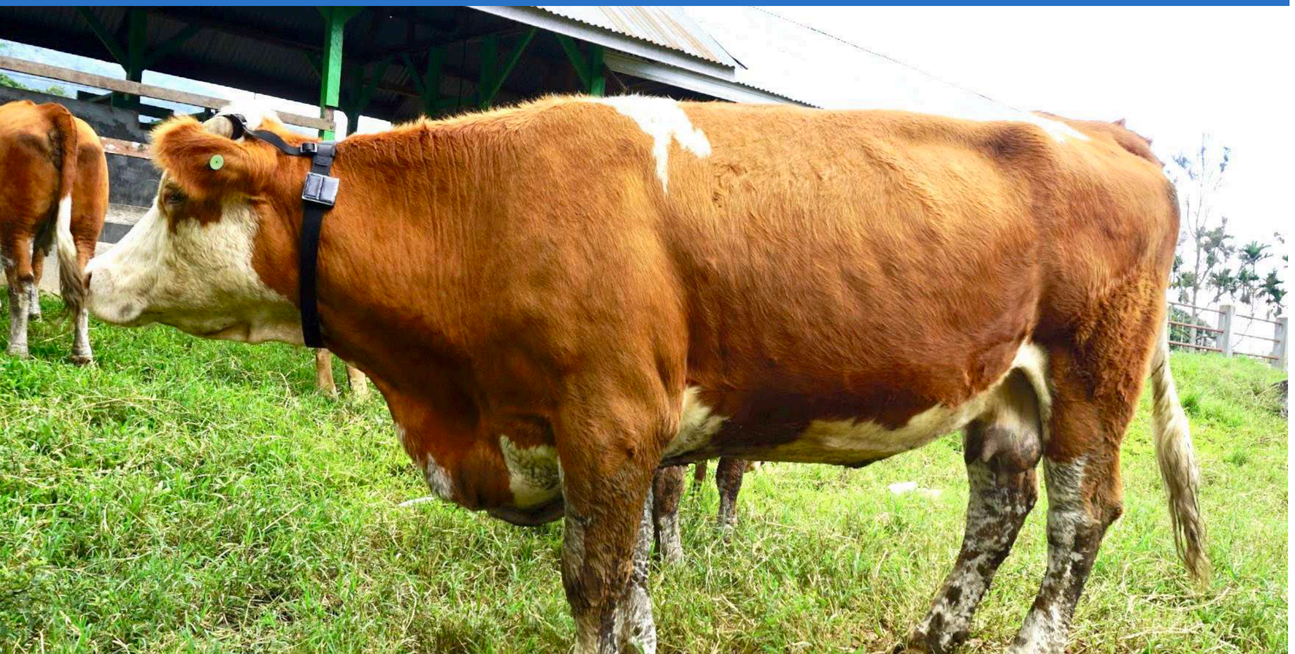
In December 2019, through the Digital Village programme, DycodeX began expanding the pilot deployment to three more farms in different regions of West Java province, starting from Cianjur region, to explore further how the solution can bring value to the livestock business and support government initiatives. "After all pilot deployments are finished, which is expected to be in April 2020, we'll present the result to the Governor himself as the Digital Village programme initiator," says Andri Yadi, CEO of DycodeX. "We are expecting to sign a MoU for government support for us to deploy the solution to more villages and farms. The plan is to deploy more than 1,000 devices in 2020, and more in the coming years."

Watch an interview with DycodeX:
https://www.gsma.com/iot/resources/m360ds19-dycodex/

RJ Farm - Subang, West Java, Indonesia



Ministry of Agriculture’s Breeding Facility - West Sumatera, Indonesia



Don’t just take our word for it

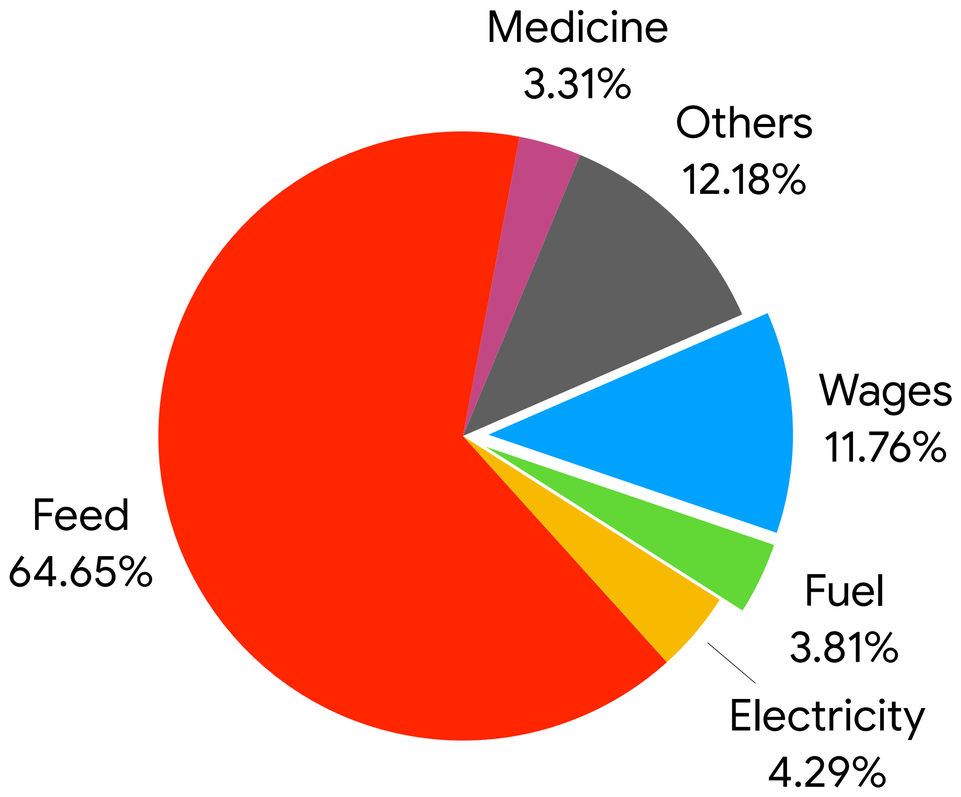
> We can **reduce the potential death** of non-eating cows significantly, by the notification from the app. Now, I can sleep well.
>
> **Rahmat**
> Owner of RJ Farm, Subang, Indonesia

> We manage 1400 cows with 100 staffs. By this platform, we can bread more cows and increase **productivity by 55%**, to increase cows population without more staffs.
>
> **Dr. Harry Suhada**
> Animal Breeding and Genetics Expert
> at Ministry of Agriculture, Indonesia

Farming Cost

$30 million!

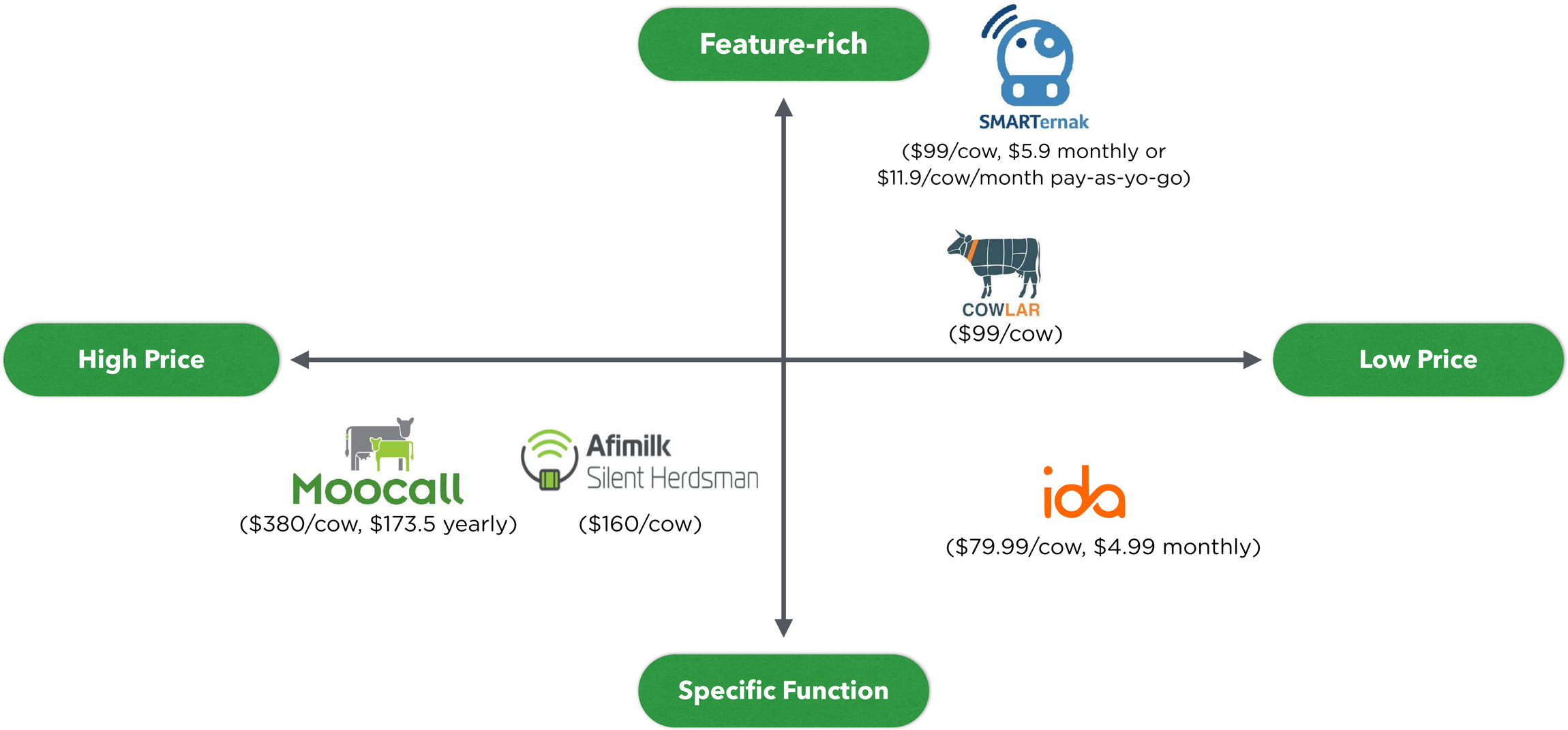
*in Indonesia alone, only for dairy farming, 2018



If on avg. **50% productivity increased**,
5.8% can be converted to profit.

In total, **USD1.7 million** saving national-wide

Competitive Landscape



A Competitor

Connecterra - IDA

Connecterra is Amsterdam's based startup developing **Ida** to help dairy farmers to increase herd productivity.

Last funding: **Series A (€4.2M)**

	ida	SMARTernak
	$9 /month, leasing	$11.9 /month, leasing
Core features		
Cattle position tracking		✓
Virtual geofencing		✓
Herd insights	✓	✓
Grazing insights		✓
Activity insights	✓	✓
Behaviour insights	✓	✓
Health insights	✓	✓
Surrounding environment monitoring		✓
Weight gain insights (beta)		✓
Fertility insights	✓	✓
Device removal alert		✓
Rich web-based dashboard	✓	✓
Android & iOS app	✓	✓
Additional features		
Energy harvesting from solar		✓
Additional battery lifetime (smart energy mgt + backup battery)		✓
LPWA connectivity		✓
Farm Type		
Dairy	✓	✓
Meat/fattening		✓
Breeding		✓

Monetisation

Device Sales + Subscription

One time,
include 1 year subscription

SMARTernak

$199*

or

SMARTernak Ultimate

$299*

+

2nd year onward, Yearly

$59

per cow, per year

Subscription includes:

Software as a Service (SaaS):
web dashboard and mobile apps, and all future software updates

8x5 Online assistance and support

Device extended warranty and support

OR

We're pursuing this

Pay-as-you-go*

Recurring, monthly

$11.9

per cow, per month

Includes everything
No upfront cost

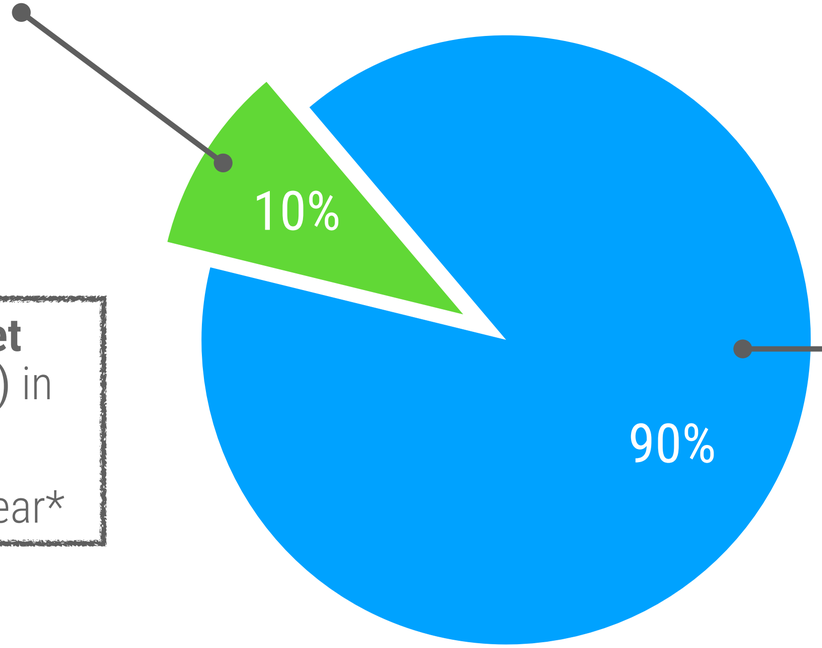
*2 years minimum contract

Market Space & GTM

17 million cows!

*in Indonesia alone. 1.5 Billion in the world

Managed by **government & corporations**:
First-phase target market

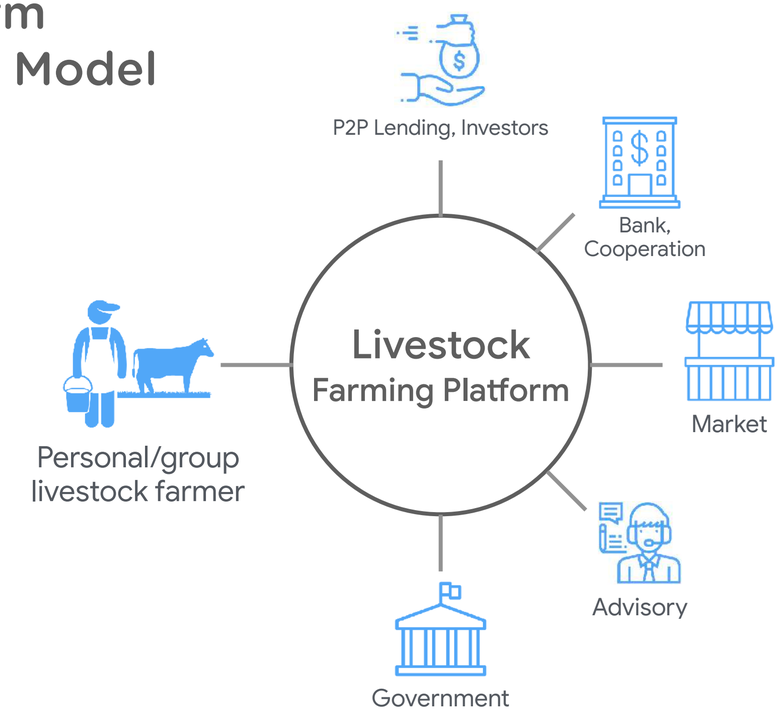


To grab **1% of market space** (~200K cows) in **5 years**.

> USD28,000,000/year*

* Estimated value based on “pay-as-you-go” monetisation scheme

Long Term Business Model



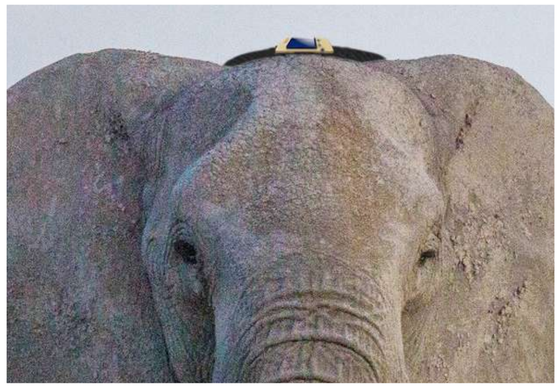
IoT- & AI-powered Precision Livestock Farming will offer more transparency, insights, and better management.

It’s all about DATA

SMARTernak is not only for cows

It’s about precision livestock farming platform

Ruminant Livestock



Wild Animal Tracking

Poultry

Tracking

Any tracking use cases, out of area alert, counting, fleet management

Funding

We had Seed

$700K

3 angel investors
1 company

We're raising...

$2M

for SMARTernak

For **$10M** Post-Money Valuation

Goals of Funding

3
years

Operation covered

Book profit in first year

Market expansion to abroad

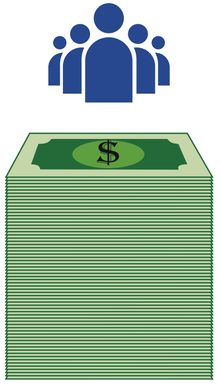
Dominate local market

500x

Market Share will be increased in 3 years

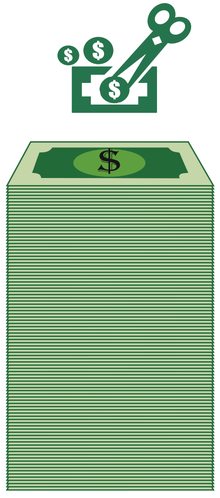
4x

Employees headcount in 3 years



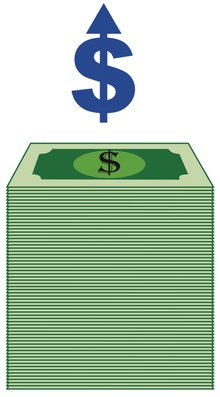
500x

Production Capacity will be increased in 3 years



10x

Customer Base will be increased in 3 years

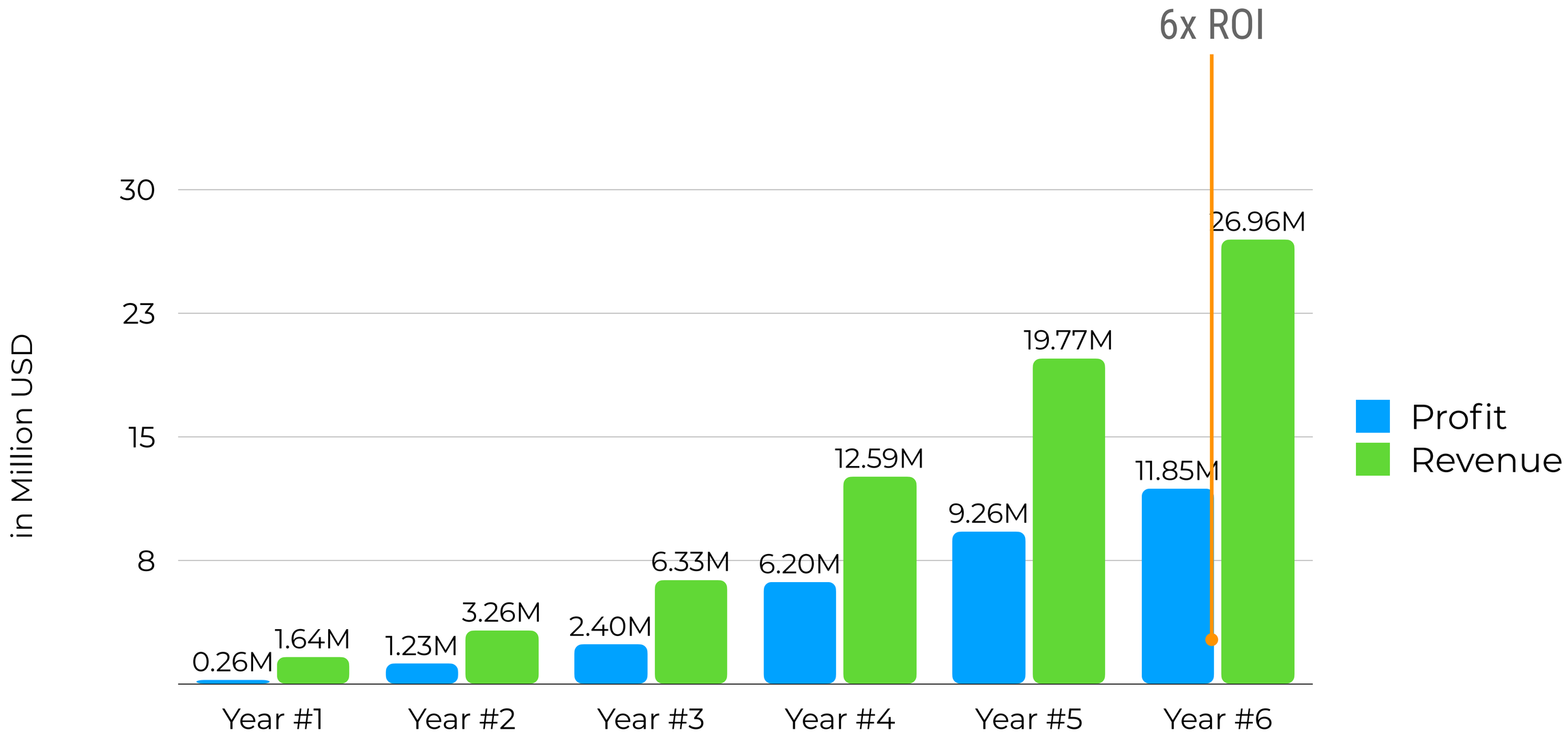


5-6x

ROI in 5 years

Financial Projection with The New Fund

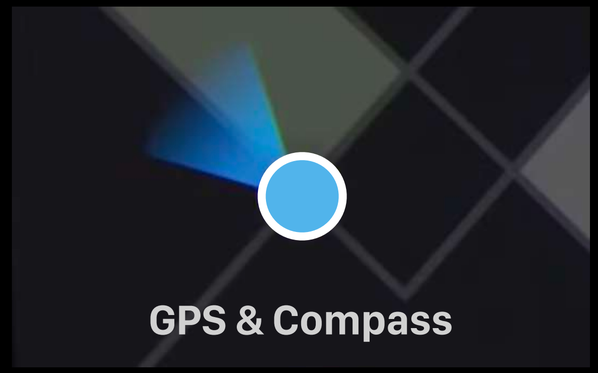
*If we get the new funding



https://smarternak.com

Long Range
Low Power IoT
Connectivity

Cattle Activity Recognition



GPS & Compass

Activity &
Performance Insights

NB-IoT
with 2G Fallback

LoRaWAN™

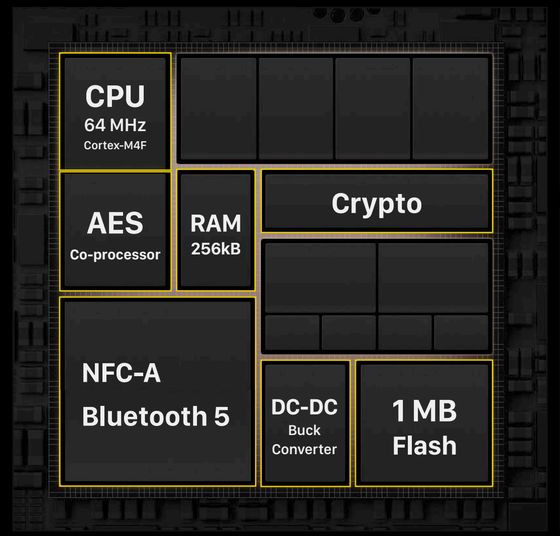
SMARTernak

On-device
Artificial
Intelligence

Notify Cattle
Health-related
Issues

Virtual Geofencing
Out of Area Alert, Herd Counting
& Grazing Insights

Device
Removal
Alert



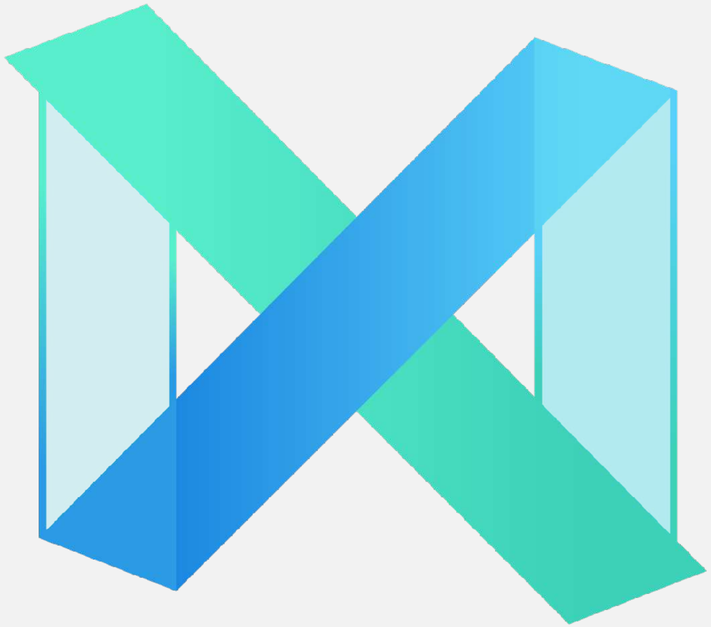
All-1/4-year Battery Life
and some more, with energy harvesting from solar

Health
Ear Tag
Ultimate
3 variants for all farm types

Sense Surrounding Environment

Smart Energy
with Backup Battery &
Energy Harvesting

Weight
Progress
Estimation*



DYCODEX

PT. DycodeX Teknologi Nusantara

AI + IoT enabler

The Company

Our vision is to solve big problems with technology.

Today, we're pioneering and leading in developing end-to-end home-grown **Artificial Intelligence (AI)** & **Internet of Things (IoT)**-based products & solutions in Indonesia.

Only a few of startups in the country capable of doing both AI & IoT, in-house!

As seen on

YAHOO! NEWS · Google · DailySocial.id · e27 · INFOKOMPUTER · TECHINASIA · CNN Indonesia · METRO TV · Bloomberg TV INDONESIA · BERITA SATU · Pikiran Rakyat · SWA · LIPUTAN6 · VIVA.co.id #newsplusentertainment

Meet Our Team

7 - 23 years of experiences

Proudly changing the world with only **14** team members

Andri Yadi

CEO | CTO

Co-founder & Vice Chairman, Indonesia IoT Association (ASIOTI)

Microsoft Most Valuable Professional (MVP) for Microsoft Azure - 14 years in a row

Ambassador & Member of Expert Network, Edge Impulse - Embedded Machine Learning platform, since 2020

Advisory board, Indonesia AI Society (IAIS)

Working with Indonesia government:

Technical Committee for IoT, Ministry of ICT of Indonesia

Author of SKKNI of IoT, SNI of IoT

Technical advisor on Peraturan Menteri about IoT LPWA tech spec

Major in **Physics - Bandung Institute of Technology (ITB)**

23 years in software & hardware engineering

18 years in entrepreneurship & management

100+ projects and products development

Startups mentor & advisor in tech

200+ speaking engagements

Core Team

Alwin

Co-CTO | Software Lead

12 years in IoT Firmware, Backend, DevOps, and Machine Learning

Ria

COO

10 years in Hardware Engineering

5 years in Operation & Commercial

Agfian

ML Engineering Lead

7 years in Software & AI/ML Engineering

Saga

IoT Hardware Lead

7 years in Hardware Engineering

Advisors

20+ years in mobile telco, finance, strategic management, IoT.
Advising on finance & product development

20+ years as successful businessman & investors.
Advising on sales

PhD on animal breeding & genetics.
Advising on animal science

Products & Services

DytraX

General-purpose Asset Monitoring Platform

Generic Asset Tracking

Cold-Chain Monitoring

Asset Monitoring

SMARTernak

Livestock-farming assistance platform

Agriculture

PowtraX

Electricity Power Monitoring & Management

Energy

machina

Industrial IoT Solutions

Pressure Transmitter

LPWA, 200 bar, for liquid & gas

Machinery Health Sensor

Liquid Tank Monitoring

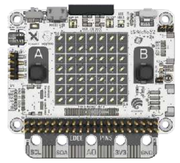
Industrial IoT

HEATRAX

AIoT Screening & Access Control

Wearable Health Tracker

Health Tech



AIoT Prototyping Platform
for Education, Makers

Prototyping

Custom IoT Hardware Design

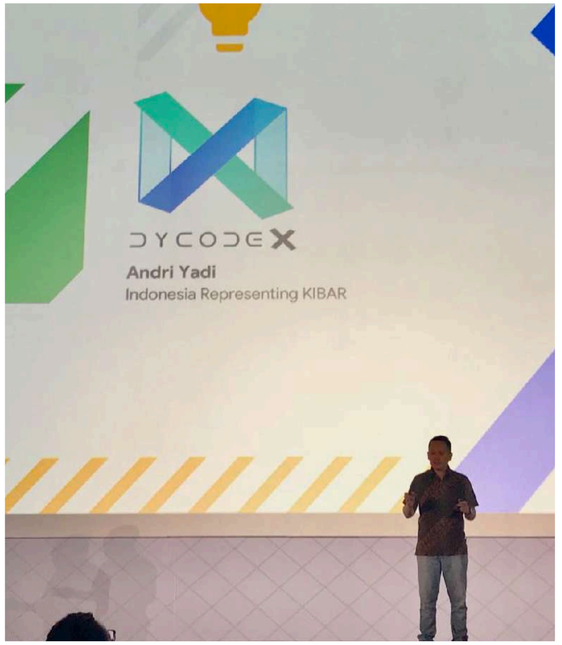
Already helped > 40 companies/startups

End-to-end AI + IoT Development

Firmware, on-device & in-cloud AI/ML,
Web & Mobile app, Backend & Cloud

Design House

Awards & Recognitions



The local winner & represents Indonesia to the **1st Google Demo Day Asia**

Champion of the 1st Intel Indonesia **OpenVino Challenge** (**AI competition**)

Won **Merit Award** in Asia Pacific ICT Alliance (APICTA) 2019 Awards for **IoT Category**

Winner of #Startup4Industry 2020 by Indonesia's Ministry of Industry, for **Pandemic New Normal** category

Partners

Supported by

3 Ministries of Republic of Indonesia

KEMKOMINFO

KEMENTERIAN PERTANIAN

Kementerian Perindustrian
REPUBLIK INDONESIA

Local Partners:

XL axiata

X-camp
Rumah IoT Indonesia

3

indosat ooredoo

smartfren.

SYNNEX METRODATA
PT. SYNNEX METRODATA INDONESIA

Telkom IoT INTERNET OF THINGS
by Telkom Indonesia

ASOSIASI INDONESIA IoT

REKACIPTA
INOVASI ITB

University Partners:

LPiK ITB
Lembaga Pengembangan Inovasi dan Kewirausahaan ITB

Telkom University

POLITEKNIK NEGERI PADANG

UNIVERSITAS NEGERI MALANG
UM

Partnering with **global brands** for IoT R&D, component supply, mass production, and go to market

u-blox

AVNET

ERICSSON

intel

WE
WÜRTH ELEKTRONIK

SEMTECH

QUECTEL

ESPRESSIF

altair
A Sony Group Company

GSMA
APAC Innovators

ST
life.augmented

muRata
INNOVATOR IN ELECTRONICS

XILINX

Define Technology Develop Solution
DTDS
Technology Pte Ltd

EDGE IMPULSE

SiPEED

Key Takeways

Through a combination of advanced sensor hardware technology and state-of-the-art machine-learning algorithms, SMARTernak is the next step in the advancement of livestock farming for the future

Big Opportunity

1.8B Cattle in 2030
$50M in 5 years in Indonesia alone

Team-Market Fit

Engineers, scientists, entrepreneurs, influential advisors, and partners

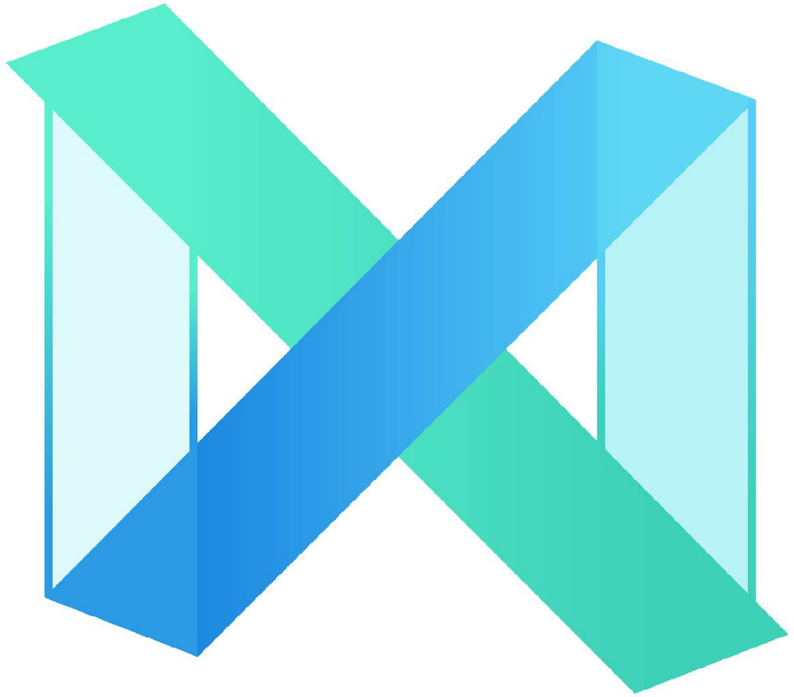
Raising $2M for SMARTernak

4x Head Count,
10x Customer Base
Scale product, to dominate Indonesia market, initial expansion to other countries

Join us to improve livestock farming, with AI & IoT

and feed the world along the way...

Keep in touch



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