PORTFOLIO · 2026 EDITION

Bring me the problem. I'll bring back a working prototype.

I build systems people love to use. **Fast.**
From the field to the boardroom.

Muktiadi Akhmad Januar

SOLUTIONS ARCHITECT

muktiadi.com

★ **Platinum**, Annual Pertamina Quality Award 2026, with the PF Lestari team



IN THE FIELD
Surveying a PF Lestari planting site with the LiDAR drone



IN FRONT OF LEADERSHIP
Pertamina's President Commissioner and President Director try the AI interviewer, 2026



FOREWORD

Built for the worst day, and for the people on it

Most of the systems in this book were built for people who will never read it: a scholarship applicant in eastern Indonesia filling a long form on an old phone with one bar of signal; a judge from a partner university who should not need an account to score a candidate; a family near the Balongan refinery waiting for a damaged house to become a payment they can trust.

I start with them. Before any screen, I sit with the people who own the problem until the real one is on paper. Then I design for the worst day rather than the average one: the deadline night when everyone arrives at once, the field with no signal, the audit that comes years later and never asks first. And I stay until the system is used without me.

At the foundation that has meant one person carrying the whole IT estate, from requirements to architecture to the production run. It taught me to choose plain, affordable parts that fail alone, to run every change to live data as a script that refuses when unsure, and to let AI read and draft while a named person decides.

This book tells the work in that order: the pain, the design, the change. It also shows what broke, and who else built what.

> **Organisations invest in business outcomes, not in technology. So I build technology meant to disappear.**
>
> The best systems do not demand attention. They remove friction, respect time, and support decisions quietly, until the only thing anyone notices is the outcome: a programme that runs, a decision made in time, an audit that passes.

Muktiadi

Muktiadi Akhmad Januar
SOLUTIONS ARCHITECT · JAKARTA, NOVEMBER 2026

AT A GLANCE

Systems people run on, from the field to the boardroom

Ten years of turning what organisations need into working systems: sitting with the people who own the problem, designing the architecture, building it, and staying until it is adopted.



FEBRUARY 2026 · THE FOUNDATION'S 15TH ANNIVERSARY

Pertamina's President Commissioner and President Director try the AI interviewer I built

P. 8

80,000+

people use PFSeries 2.0

From the cities to the 3T regions, many on the oldest phone in the house.

P. 18

500+

judges, not one account

Lecturers from dozens of universities scored candidates from a link and a PIN per seat.

P. 6

10 years

from administrator to architect

A university's web systems in 2016; a national foundation's whole IT estate in 2026.

P. 47

Platinum ★

Annual Pertamina Quality Award 2026

Six months after Gold, with the PF Lestari team: I built its field tools and flew the surveys.

P. 9

½

of all applications arrive on the last day

So the platform is built for the last night, not for the average one.

P. 13

4.8

out of 5, rated from inside the platform

Thousands of applicants; one in three used a word for easy.

CONTENTS

Four parts, from the deepest work to the widest range

Every chapter opens the same way: **Discover** the pain, **Design** the system, **Deliver** the change. Every line here is a link, and the tabs at the top of each page jump between parts.

1

PFSeries 2.0

One platform, every programme, each choosing people its own way

PFSeries 2.0 8
Every programme on its own spreadsheets and inboxes

Sobat Bumi scholarship 17
Too many applications to read fairly by hand

PFmuda Case Challenge 19
Hundreds of teams, one fair interview

PFpreneur and its LMS 21
Thousands to teach and test, fairly, on phones

PFsains 23
Reviewers outside their field, budgets elsewhere

PPN, BSBK and the shared machinery 24
A new programme, new rules, weeks to launch

Running it live 25
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Beasiswa Pertamina 26
From a list of names to a signed contract and money

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Running a foundation on software

The same habits, pointed at very different problems

PFdrive 29
A dozen jobs spread across forms, chats and sheets

Kira and the AI work 32
Skilled people spending hours listening and reading

Prototypes and UI/UX 33
Ideas nobody can judge from a slide

Events and big screens 36
Live moments where nothing can go wrong

Grant monitoring and disbursement 38
Money out, and no way to prove who changed what

Infrastructure and operations 40
A small team, national peaks, a small budget

Architecture documents 43
A system only one person could explain

Forest, tags and vision 45
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3

Before the foundation

Where the habits came from

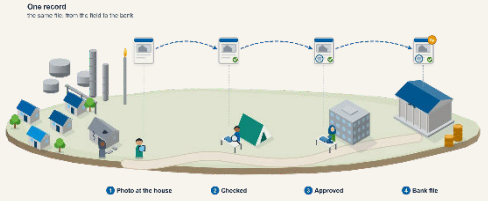
Refinery crisis response 49
Fast compensation that must survive an audit

Pertamina HC 51
Reports, plans and permits rebuilt by hand

Where it started 52
Machines and sites that cannot go down

A semester in Europe 53
Engineering, in another country

The living lab 55
Student projects finished, shown and written down



Balongan, 2021: one record, from a damaged house to the bank file.

4

Beyond work

What I build for myself, and why it matters to clients

The workshop at home 58
What the shop could not sell

Saku, BinaTOEFL and templates 60
Tools that look back, or feel like a wall

Reel and film engines 61
Demos that blur, apps nobody explains

Sea Wake, a passion project 62
Every skill, in one world



Sea Wake, my passion project: every skill in one world.

ALSO IN THIS BOOK Foreword 2 · At a glance 3 · The role 5 · Ten years on one page 6 · Built to keep working 64 · How I work 65

NEXT A solutions architect's job, from the first meeting to the last handover.

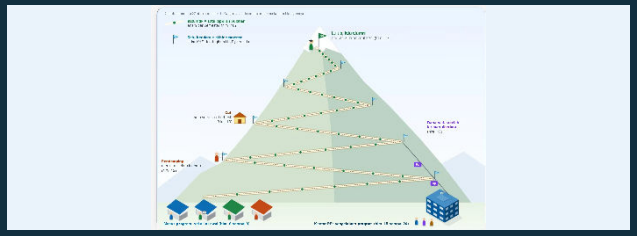
A solutions architect, from the first meeting to the last handover

Requirements, architecture, delivery: the three words on my name card, one person's job in a small organisation, and the three beats that open every chapter. Each line links to its proof.

REQUIREMENTS

Discover.

Sit with the people who own the problem until the real one is on paper.



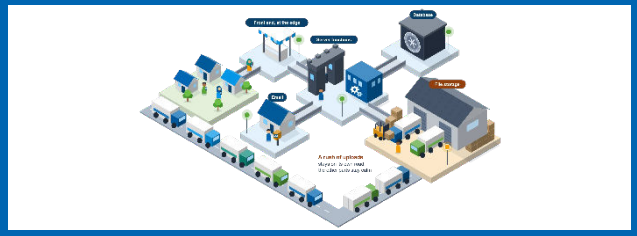
A scholar's years as one climb, drawn with the scholarship team before anything was built (in Indonesian, for them).

- Workshops with every programme: list the steps, walk each to the end, draw it 8
- Benchmarks before design: bank recruitment portals and a ministry scholarship app 43
- Process models in BPMN and Sparx, validated by the owner of each process 43
- Open decisions listed by who must answer, in an interactive flow 26
- The data protection law read as nine requirements under every feature 8

ARCHITECTURE

Design.

Turn constraints into principles, and principles into parts that fail alone.



PFSeries 2.0 in four parts that never wait for each other: a rush of uploads stays on its own road.

- Any phone, any signal, any crowd: the principles behind every screen 8
- Edge, server functions, database, files and email kept apart 8
- One grid instead of a generator in every house: the enterprise blueprint 43
- Zero trust and a gated delivery pipeline, with written triggers to build or buy 40
- AI that reads and people who decide, written into the code 17

DELIVERY

Deliver.

Build it, run it through the peak, and stay until people use it without me.



The live platform's first-visit walkthrough: step one of four, so nobody starts lost.

- Built with AI agents under written rules, frozen tests and a merge gate 62
- Every change to live data by a guarded script: dry run, backup, refuse when unsure 25
- Users wrote in the afternoon; the fix shipped that evening 19
- Adoption: training, guides from live screens, a champion in every unit 29
- Handover: a tender package, controlled documents, an honest self-review 43

ACROSS FIVE KINDS OF SYSTEM

Software

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- Saku, BinaTOEFL and templates 60
- Reel and film engines 61
- Sea Wake, a passion project 62

Data

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- Refinery crisis response 49
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AI

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Cloud and operations

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- Running it live 25
- Architecture documents 43

Embedded and field

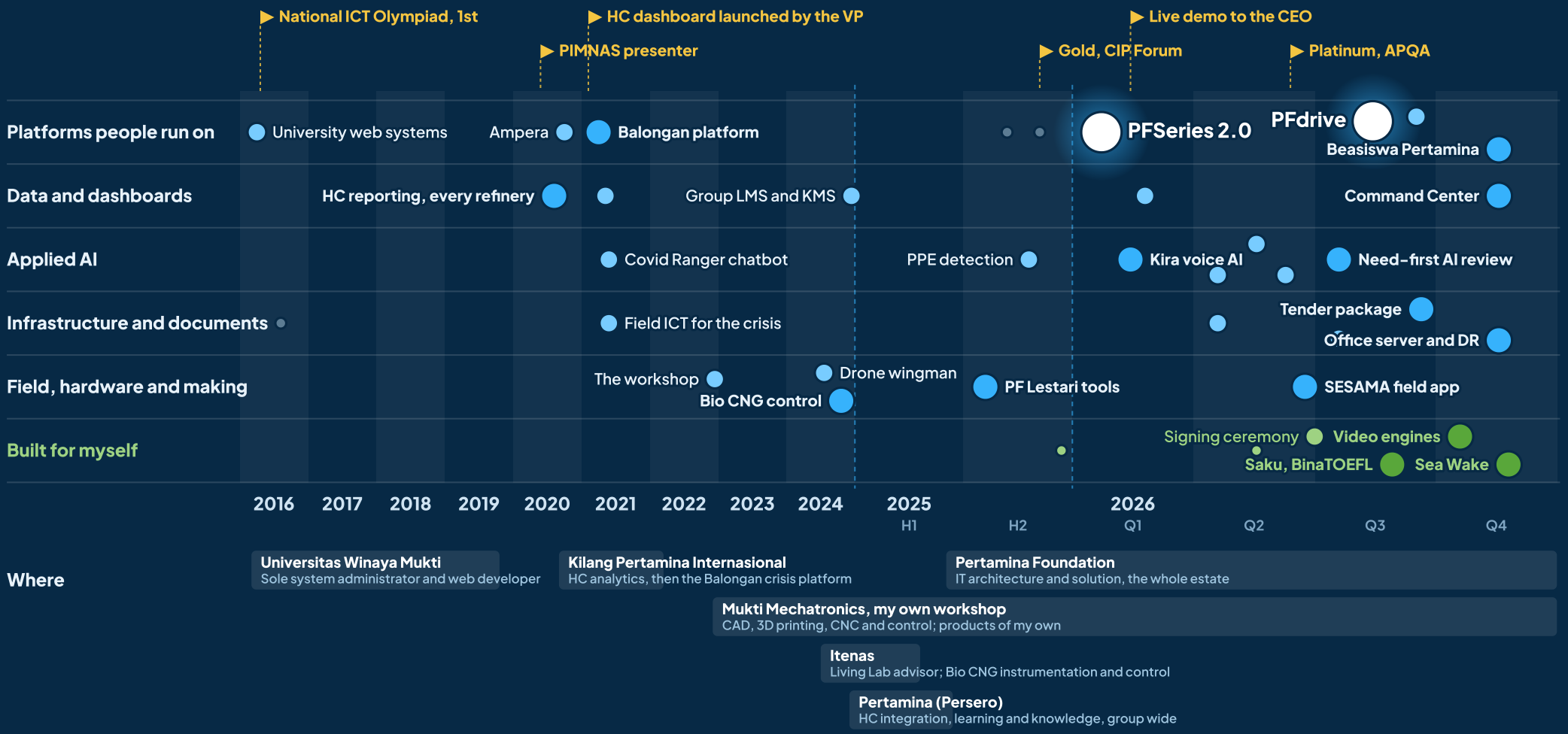
- Where it started 52
- The living lab 55
- Forest, tags and vision 45
- The workshop at home 58

LEARNED *work built before the design was agreed got thrown away, so I now align on a clickable artefact before building.*

NEXT Ten years of that work on one page.

A decade of groundwork, then two years at national scale

Every dot is a project, sized by how deep it goes. Time widens toward the present (years, then half years, then quarters) because that is where most of the depth sits.



Flagship: months of work, real users at scale · Substantial · Solid · Small: unlabelled dots are smaller pieces of the chapters beside them · Built for myself · Recognition

LEARNED *manual work on a schedule is a computer's job done by hand, so every system since starts from spotting it.*

NEXT The biggest dot on the map comes first: PFSeries 2.0, the platform every programme of the foundation runs on.

PART 1

PFSeries 2.0

One platform, every programme, each choosing people its own way

It comes first because it goes deepest: ten months, more than a thousand commits, and every programme of a national foundation running through one system, for applicants from the cities to the most remote regions.



8 **PFSeries 2.0**
Every programme on its own spreadsheets and inboxes

17 **Sobat Bumi scholarship**
Too many applications to read fairly by hand

19 **PFmuda Case Challenge**
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21 **PFpreneur and its LMS**
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23 **PFsains**
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24 **PPN, BSBK and the shared machinery**
A new programme, new rules, weeks to launch

25 **Running it live**
It works on Tuesday, then fails on deadline night

26 **Beasiswa Pertamina**
From a list of names to a signed contract and money

Indonesia, where every applicant comes from: 38 provinces, from Aceh to Papua.

1

PFSeries 2.0: built for every phone in Indonesia

WHAT IT IS PFSeries 2.0 is Pertamina Foundation's registration and selection platform. Every programme runs on it, from scholarships and innovation funding to youth leadership, women's entrepreneurship and disaster volunteers: applicants register, fill one form, learn, test and record; judges score; final deciders choose; leadership watches.

Discover.

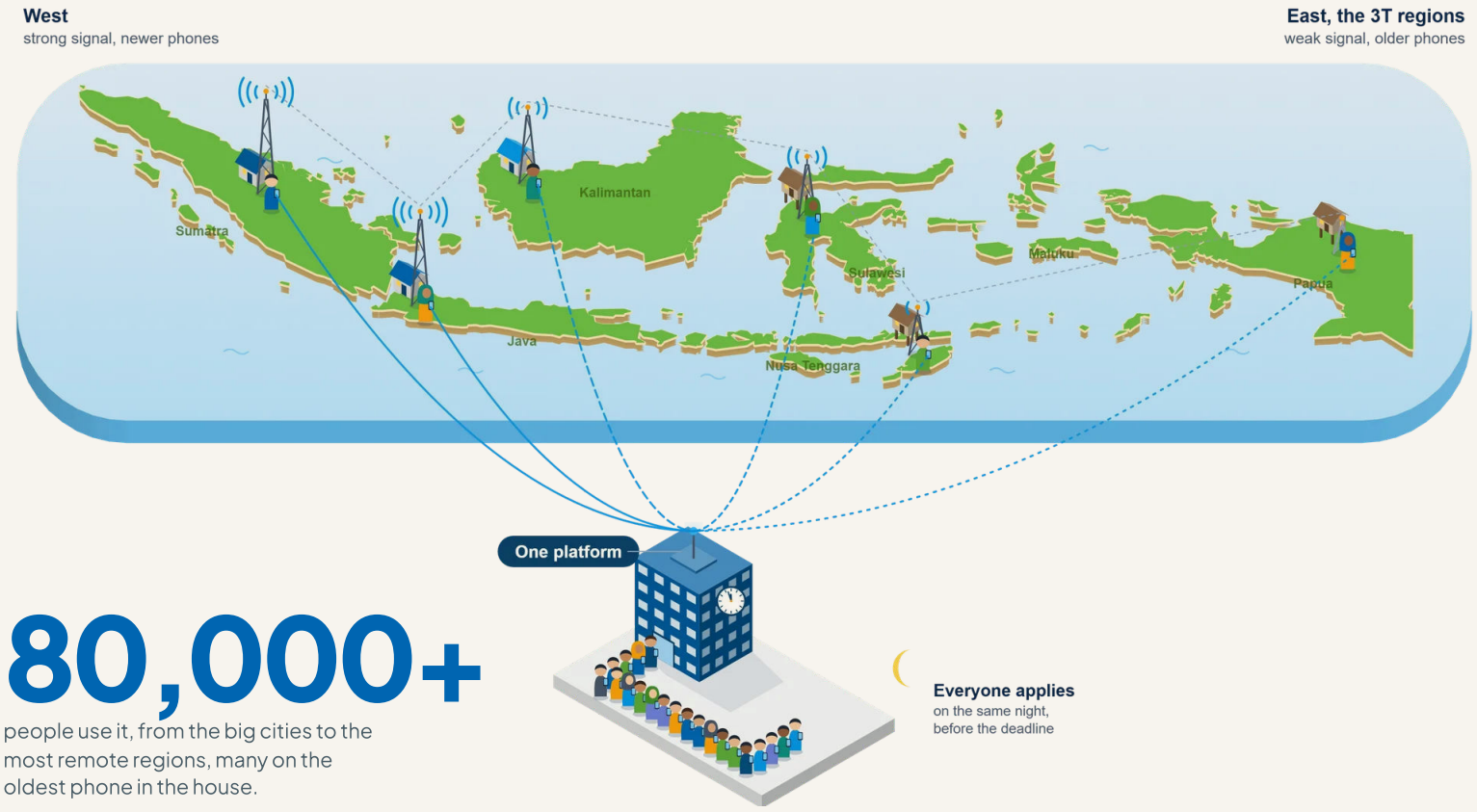
Every programme of the foundation chose its people on separate spreadsheets, forms and inboxes, for applicants spread from the big cities to the most remote regions.

Design.

One platform where every programme registers and selects, designed for old phones, weak signal and deadline-night surges, with the front end, back end, database and files kept apart.

Deliver.

Every programme of the year on one platform, used by more than 80,000 people across Indonesia.



80,000+

people use it, from the big cities to the most remote regions, many on the oldest phone in the house.

SIX PRINCIPLES, ALWAYS IN MIND: EVERY FEATURE IN THIS BOOK TRACES BACK TO ONE

Any phone

Light pages, installable, no app store.

Any signal

Never lose what was typed or recorded.

Any crowd

Stay standing when everyone arrives at once.

Kept apart

One busy part never drags the others down.

People decide

AI reads and drafts; a named person decides.

On the record

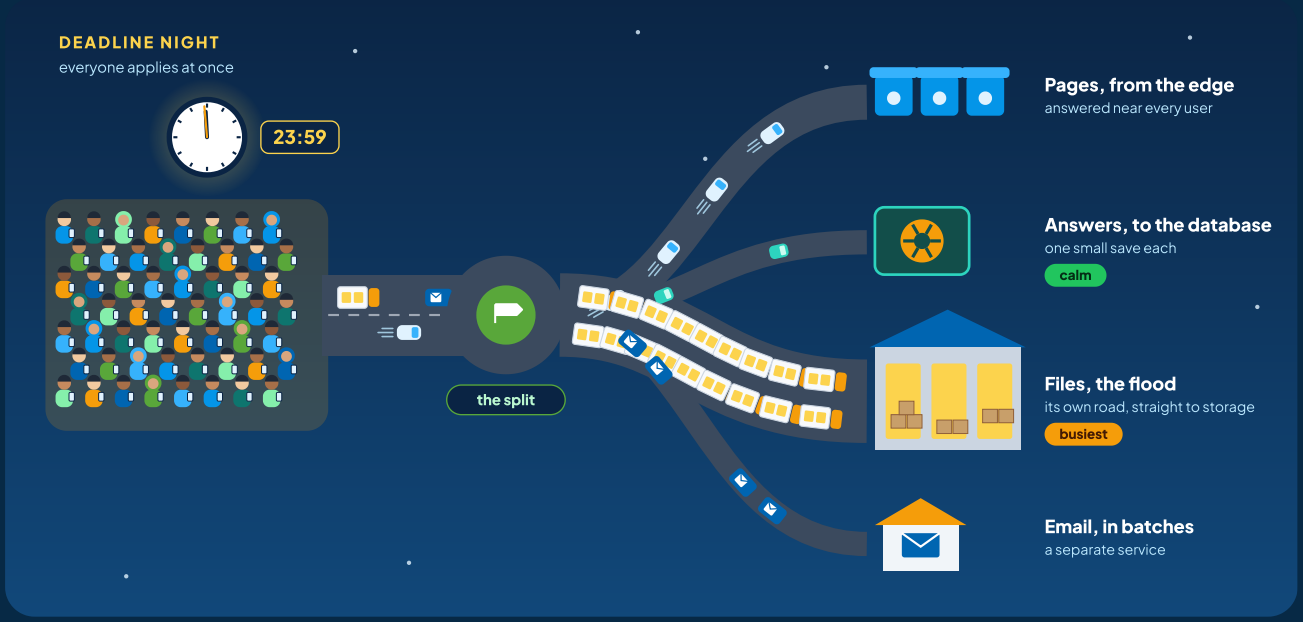
Every action audited, every live change scripted.

LEARNED *some mobile networks block direct storage uploads, so every upload tries the direct road first, then detours through our own domain.*

NEXT Those principles decided the architecture: four parts, kept apart.

Deadline night, split into four roads

Everyone arrives in the last hours, and the files arrive heaviest. So each kind of traffic gets its own road to its own place: the flood of uploads never queues in front of the database that saves everyone's answers.



Pages, from the edge
CLOUDFLARE PAGES AND WORKERS

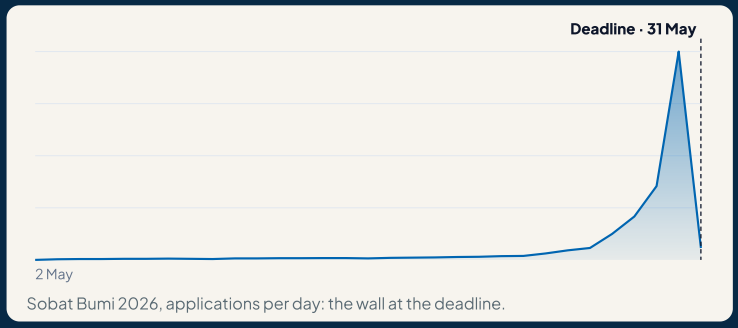
Answers, to a calm database
POCKETBASE

Files, the flood
CLOUDFLARE R2

Email, in batches
POSTMARK

1/2

of all applications arrived on the last day; one in eight in the final hour.



Sobat Bumi 2026, applications per day: the wall at the deadline.

Pages that ask little of the phone

Served from the edge and installable from the browser; a tab left open across a release reloads itself once instead of breaking.

ANY PHONE

A door that forgives

Bot checks retry at the peak instead of rejecting people, and links opened inside Instagram or WhatsApp jump to the real browser.

ANY CROWD

A database never asked for everything

Dashboards read a page at a time and answer from cache while they refresh.

KEPT APART

Six ways to upload one file

Some carriers block cloud storage, so uploads try the direct road first, then detours through our own domain.

ANY SIGNAL

Email that cannot slow the site

Announcements to thousands leave in throttled batches that heal themselves.

KEPT APART

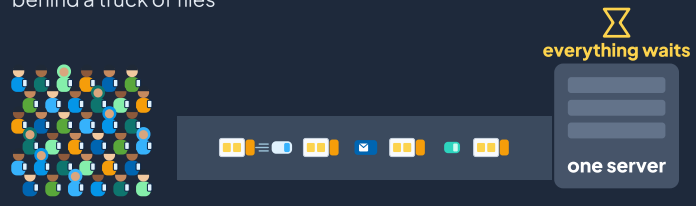
A heartbeat for every part

Each part is timed on its own, so the slow one shows by name instead of "the site is slow".

ON THE RECORD

WITHOUT THE SPLIT

one road, one server: every save waits behind a truck of files



1

Everyone arrives on the last night, so the last night is what it is built for



Sobat Bumi 2026, applications submitted per day, with every incident pinned where it happened. Shape only, no counts.

1. **Opening weekend: the anti-bot check rejected many real applicants on mobile networks.** The check retries with backoff and runs at submit, so tokens are fresh.
2. **Uploads from cloud drives and some saves failed silently on phones.** Five ways to read a file before giving up, and a quiet retry for saves.
3. **A broadcast to every applicant slowed the whole site.** Bulk writes in batches, bounded concurrency; later the delivery callbacks were indexed and trimmed.
4. **Error logging became the load: a retry loop on deleted log rows starved the database writer, reads waited about a minute.** Error log writes switched off the same night; the pipeline is kept for a redesign.
5. **Saves took up to a minute at the peak and dropped, so applicants lost edits without knowing.** An index turned every save into a single lookup; unsaved work now shows a timer, a banner and a leave-page warning.
6. **Two date fields disagreed on the deadline: one page said four days left, another two.** One deadline, read from the field the server enforces.
7. **No way to pause the site or see which leg was slow.** A maintenance switch that needs no deploy, and a heartbeat that times each leg.
8. **Staff dashboards failed while the database was busy.** Dashboards serve the last good copy and load in chunks.
9. **Some submitted files had never reached storage.** Submit checks every file in storage and sends the applicant back to re-upload.
10. **The form stayed open past midnight because closing only checked a stage lock.** Every form closes on status or deadline, server side.
11. **A scan found incomplete submissions.** A one-day revision window for exactly those applicants, closed by code.

THE FINAL THREE DAYS, HOUR BY HOUR



Every night taller than the last; the tallest hour is 11 pm on the final night.

THE SAME SHAPE, PROGRAMME AFTER PROGRAMME



PFpreneur, March to April
Fixes in the final weeks

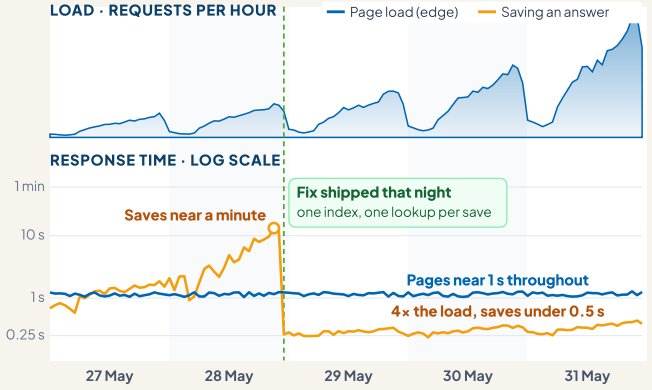
PFmuda, June to August
Closed with no fixes

PFsains, August to September
Closed with no fixes

What changed. PFpreneur and Sobat Bumi needed fixes in their final week; PFmuda and PFsains then closed with the same wall and no fixes at all.

Pages stayed near a second all week. Saves crept toward a minute once, on 28 May; one index fixed it that night, and the final night ran at four times the load with saves under half a second.

LOAD WENT UP; THE PLATFORM DID NOT SLOW DOWN



Illustrative, from the incident log; real page loads measured 1.07 to 1.17 s.

LEARNED *accounts arrive at launch and work arrives at the deadline, so the platform is built for reads at the start and writes at the end.*

NEXT On top of those parts runs one selection engine that every programme configures.

One engine, every programme

Programmes arrive with their own rules and weeks to launch. Instead of a system each, every programme is a configuration of one engine: which stages it uses, how it scores, who judges.

THE SWITCHBOARD: STAGES ACROSS, PROGRAMMES DOWN, LIT WHERE SWITCHED ON

1	2	3	4	5	6	7	8
Register Applicant one account a checked ID	**Form and files** Applicant a long form that never loses work	**Learn or test** Applicant classes, tests recordings	**Auto score** The system a rubric set as configuration	**AI reads** AI, advisory notes for people never a verdict	**Panels** Judges one link and a PIN each	**Decision** Final decider a written reason every time	**After** Winners certificate contract, catalogue

Leadership watches every stage live, read-only

PROGRAMMES	1	2	3	4	5	6	7	8
Sobat Bumi	●	●	○	●	◎	●	●	●
PFmuda	●	●	●	○	◎	●	●	○
PFpreneur	●	●	●	●	○	●	●	●
PFsains	●	●	○	○	○	●	●	○
BSBK	●	●	●	●	○	●	●	○
PPN	●	●	○	●	○	●	●	○
PFbangkit	●	●	○	○	○	○	○	○

Every programme is a configuration of the same engine: stages switched on, its own rubric, its own people. A new programme takes weeks, not a new system.

THE SAME ENGINE, FOUR PROGRAMMES, FOUR DIFFERENT FORMS



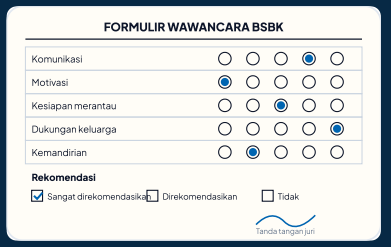
Sobat Bumi
Each aspect scored beside the candidate's own claims



PFsains
Levels, a pass line, a note the judge must write



PFmuda
A mentor's seven aspects, never a score



BSBK
Looks like the paper form it replaced

A new programme is a configuration, not a project: switch on its stages, set its rubric and its people, and it runs on the same tested line.

80,000+ users and more than a thousand commits in ten months. The architecture, every screen and every production run are mine; most of the code was typed by AI agents working under rules, tests and gates I wrote (how, on page 65).

WHO WORKS INSIDE

Applicants register, fill one long form, upload, learn, test, record
Programme staff run each stage, import, publish
Judges and kurators score from one link and a PIN
Final deciders decide with the evidence side by side
Leadership watch every funnel, read-only

1

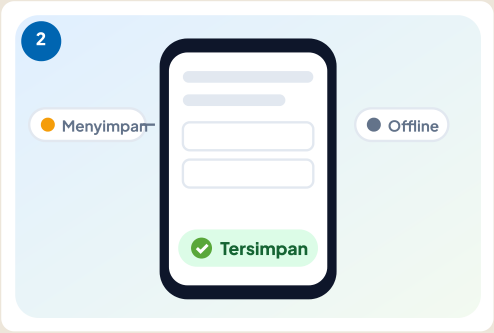
Sixteen small things that make it feel made for people

Nobody asks for these. Each one removes a moment of doubt for someone filling a long form on a small phone.



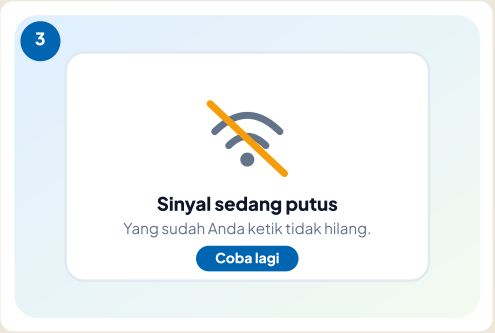
“Did you mean gmail.com?”

Typos caught at sign-up, the fix one tap away. An applicant who mistyped can still reclaim the account by their registration ID.



A save status that never lies

Saving, saved or offline, always on screen. A failed save stays on screen with a retry, so work is never lost silently.



A page that waits for the signal

What was typed is never lost. App code is never cached, so a release never serves a stale screen.



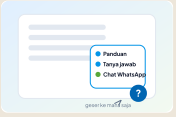
A judge’s door: one link, one PIN

Outside judges never make an account. Lecturers from partner campuses score from a link and a PIN per seat.

AND TWELVE MORE



5 Unsaved work is never silent
A bar and a timer until it is stored.



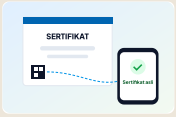
6 Help that stays out of the way
Drag it aside: guides, answers, a chat.



7 A passport photo, guided
Face guides in the browser; nothing to install.



8 A campaign frame in one tap
Applicants share it; the programme spreads.



9 Certificates that verify themselves
Scan the QR, see it is real.



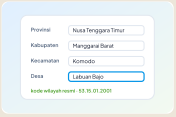
10 Each programme in its own colour
One platform, many identities.



11 A first-visit walkthrough
Five steps, so nobody starts lost.



12 Installable, no app store
On the home screen from the browser.



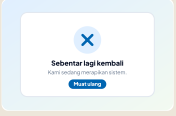
13 Addresses from official codes
Province to village, matchable later.



14 WhatsApp-first invitations
Join from a personal link in a chat.



15 Links that preview properly
A real card, not a bare address.



16 Maintenance without a release
Switched on and off without deploying.

LEARNED *a swallowed error once made a form look saved while nothing persisted, so a silent catch is banned across the codebase.*

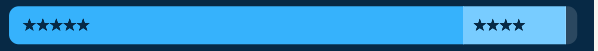
NEXT The people using it noticed, and said so in the platform itself.

RATED FROM INSIDE THE PLATFORM

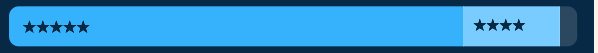
4.8

out of 5, from thousands of ratings given inside the platform, in the middle of 2026.

The experience overall



How clear the form was



about four in five gave five stars · most of the rest gave four · three or fewer

Nearly all

gave four or five stars.

One in three

written comments used a word for easy: mudah, gampang, tidak ribet.

Built for them

Many writers called themselves not tech-savvy, older, or a mum: exactly the reader it was designed for.

IN THEIR OWN WORDS · INDONESIAN AS WRITTEN, WITH AN ENGLISH GLOSS

“Awalnya saya takut gaptek, ternyata aplikasinya gampang.”

“At first I was afraid I was too clumsy with tech, but the app turned out easy.”

A PFPRENEUR APPLICANT WHO DID EVERY MODULE ON A BUDGET PHONE

“Dari Pf preneur yg sebelumnya, ini jauh lebih bagus dan mudah kami mengaksesnya.”

Compared with the previous PFpreneur, this one is much better and easier for us to access.

PFPRENEUR APPLICANT

“Terus terang saya sendiri baru pertama x ikut program seprti ini ditambah jarang utak atik hp, awal agak kaku tapi KEREN LOH !”

My first programme like this, and I rarely fiddle with my phone. Stiff at first, but it is COOL!

PFPRENEUR APPLICANT

“Label serta pilihan menu yang disediakan juga konsisten dari awal hingga akhir… Pertahankan kualitas sistemnya!”

Labels and choices stay consistent from start to finish. Keep the system’s quality up!

SOBAT BUMI APPLICANT

“Sangat baik sekali, meskipun saya gaptek, akan tetapi masih bisa mengoperasikan dengan mudah. Ketakutan sebelum nya hilang”

Even though I am not tech-savvy, I could still use it easily. The fear I had before is gone.

PFPRENEUR APPLICANT

“Bagi emak2 pensiunan seperti saya aplikasinya tdk ribet.”

For a retired mum like me, the app is no hassle.

PFPRENEUR APPLICANT

“Sistem berjalan dengan lancar tidak pernah ada error maupun kendala yang berarti.”

The system runs smoothly, never an error or any real problem.

PFPRENEUR APPLICANT

“Dengan adanya aplikasi ini seumuran saya tadinya malas belajar. Ini malah semangat untuk mencari tahu.”

At my age I used to be reluctant to learn. With this app I actually got eager to find out.

PFPRENEUR APPLICANT

“…langsung bisa melihat hasil pretest, postest dan tugas tugasnya yang sdh dikirim, jadi tidak was was, apakah sudah terkirim atau belum.”

I see my test results and submitted work right away, so I never worry whether it was sent.

PFPRENEUR APPLICANT

“Proses digitalisasi seluruh rangkaian program ini sangat membantu pelaku UMKM yang memiliki mobilitas tinggi seperti saya.”

Putting the whole programme online really helps small business owners always on the move, like me.

PFPRENEUR APPLICANT

“Aplikasi Pf series sangat membantu selama kurasi 2 ..stabil materi mudah diakses ulang dan hasil pretest dan postest langsung keluar”

Stable, materials easy to reopen, and test results come out immediately.

PFPRENEUR APPLICANT

“Tidak terdapat kendala sama sekali untuk pertanyaan dalam formulir, semua ditulis dengan jelas…”

No trouble at all with the form; everything is clearly written.

PPN DIPLOMA APPLICANT

“apalagi bisa dibuatkan twibbon. itu sangat memudahkan para pendaftar”

It even makes you a campaign photo frame, which makes it very easy for applicants.

SOBAT BUMI APPLICANT

“Sekali klik lsg masuk ke inti yg akan kita bahas”

One click and you are straight into what we will discuss.

PFPRENEUR APPLICANT

1

Asked where it happens, never by a survey link

A rating closes a learning phase, follows a submitted form and sits before the last screen of a recorded session. The same boxes also carried what people wanted next.

WHAT THEY ASKED FOR, IN THE SAME COMMENT BOXES

> **“Mungkin bisa ditambahkan fitur push notification atau kalender pengingat…”**
> *Push notifications or a reminder calendar for deadlines.*

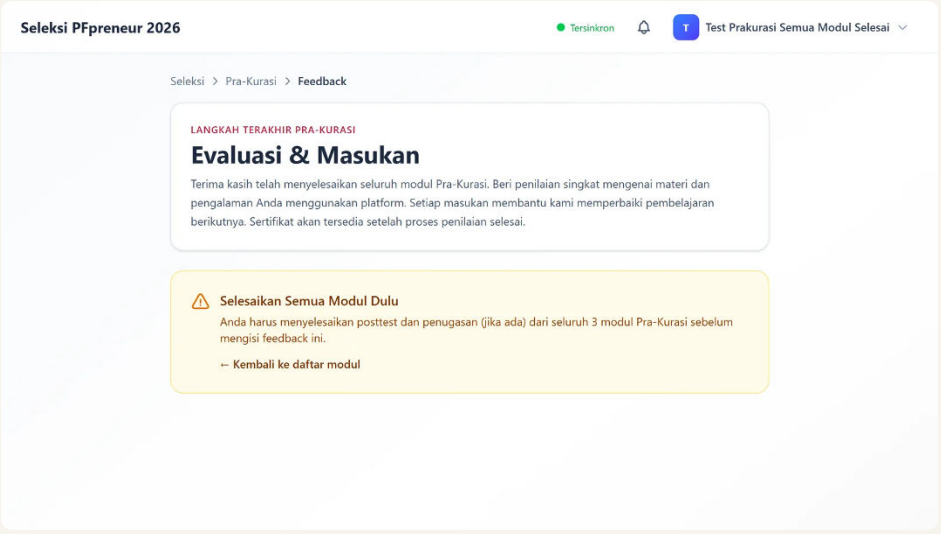
> **“Masih perlu ada CS manusia bukan robot”**
> *Still needs human support, not a robot.*

> **“Tulisan di aplikasi hurufnya terlalu kecil dan instruksi terlalu panjang”**
> *The text is too small and the instructions too long.*

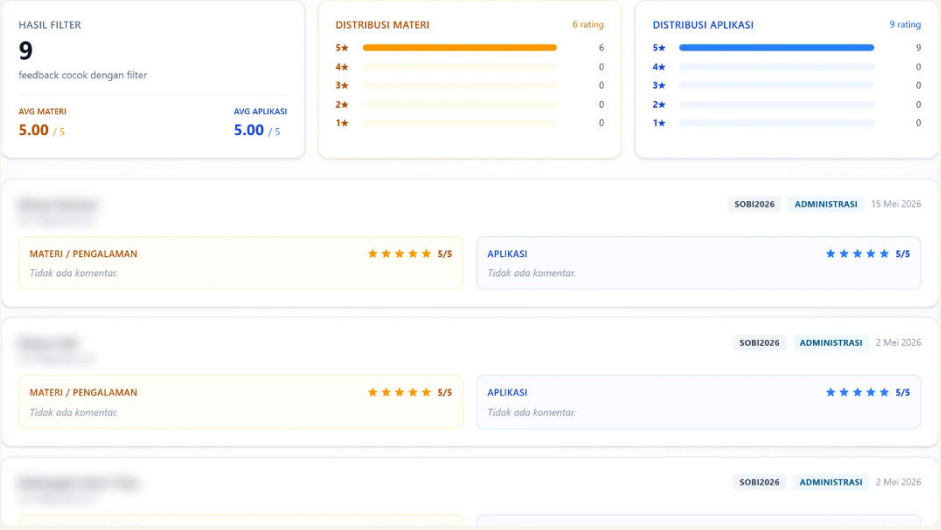
> **“…saat pindah ke soal berikutnya tampilan tidak langsung ke awal halaman”**
> *The next question does not jump back to the top of the page.*

> **“Fitur preview file sebelum upload untuk meminimalisir salah kirim.”**
> *A preview before upload, so the wrong file is not sent.*

> **“…unggah dokumen yang terkadang lambat dan beberapa bagian formulir perlu diisi ulang ketika jaringan terganggu.”**
> *Uploads are sometimes slow, and a dropped connection meant refilling parts of the form.*



Where they wrote it: the last step of a learning phase, stars and a box for why.



Where staff read it: every star beside the words that explain it.

HOW THE PLATFORM LISTENS

Asked where it happens
A rating closes a learning phase, follows a submitted form, and sits before the last screen of a recorded session. Never a survey link.
PEOPLE DECIDE

Every star with its reason
Each rating shares a card with the box that explains it, so a three arrives with why.
PEOPLE DECIDE

Read by the people being rated
Mentors read what their own participants said about their teaching, without admin access.
ON THE RECORD

Counted at a fixed cost
The statistics are totals, never rows, so the page costs the same at any size.
KEPT APART

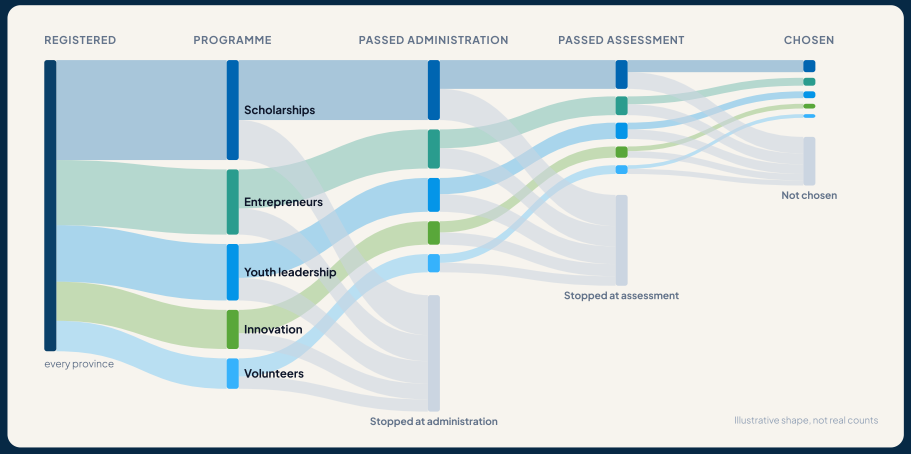
Leadership sees every funnel without asking anyone

One read-only page: where applicants come from on a map of Indonesia, a 90-day registration trend, and how registrants flow into each programme and narrow stage by stage.



The leadership page, redrawn with illustrative values.

FROM EVERY PROVINCE, INTO EACH PROGRAMME, STAGE BY STAGE



Band widths show the shape only, never counts; those who stop at a stage peel off in grey.

Every candidate's path
Each programme's selection drawn as one flow, passed and stopped at every stage.
ON THE RECORD

Watched live
Staff monitors follow interviews, discussions and reviews as they happen, and download each judge's load.
ANY CROWD

Sliced by operating region
Admins map each regency to a Pertamina operating unit, matched by official region code.
ON THE RECORD

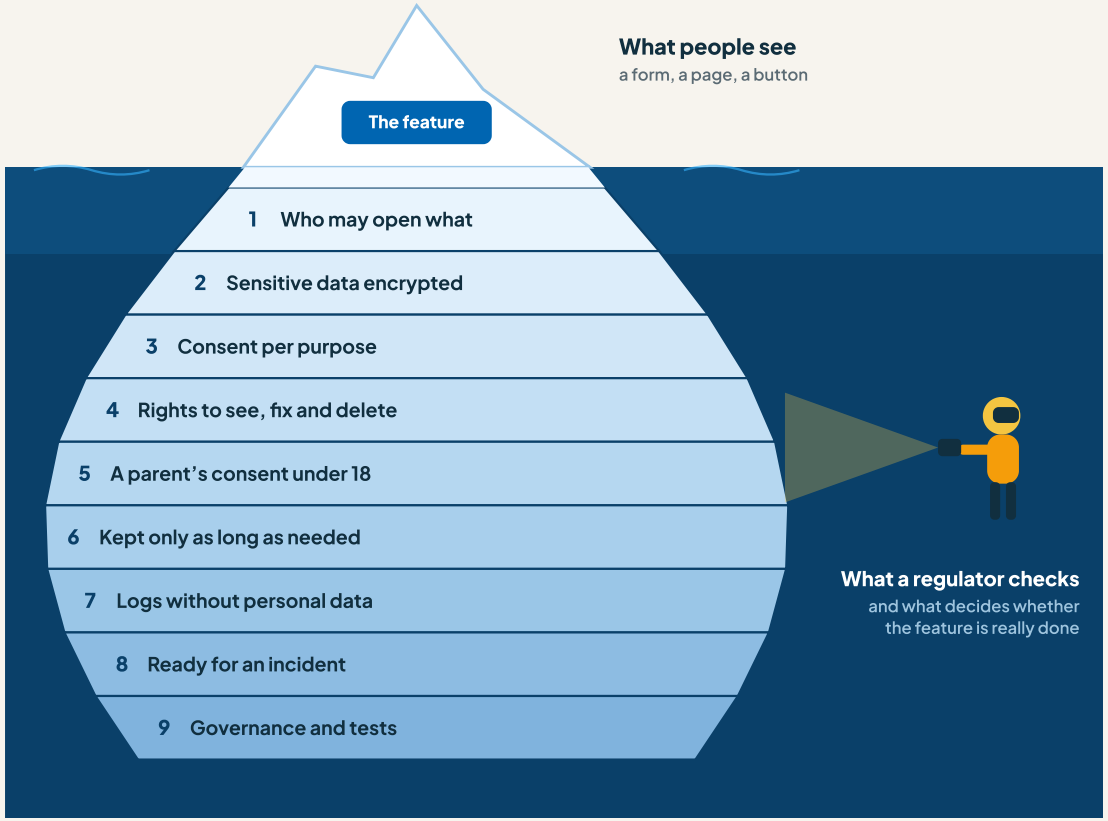
Numbers before a decision
Final deciders see the spread by campus, field, region and judge, with a quota projection.
PEOPLE DECIDE

No monthly recap to wait for: the numbers leadership reads are the same records the programmes work in.

1

Trust built in, not promised

A national platform holds the data of tens of thousands of young people, many under eighteen. The feature is only the tip; what sits under it decides whether it is done.



Audited by its own builder. When the data protection law came, I checked my own platform against these nine layers, reported the gaps to management, and proposed two tracks: features continue as minimum safe versions under guardrails, while a foundation track closes each gap and proves it closed with a test.

WHAT THE APPLICANT CAN SEE AND CONTROL

Your own login history

Every sign-in with its device, method and time, visible to the person it belongs to.

ON THE RECORD

An email change confirmed twice

The new address only takes over once its own inbox confirms it.

ON THE RECORD

Leaving, deliberately

Deleting an account takes three steps, frees the ID and email, and leaves an audit row behind.

PEOPLE DECIDE

Terms with versions

When the terms change, everyone accepts the new version at their next login, and each acceptance is logged.

ON THE RECORD

A help desk with threads

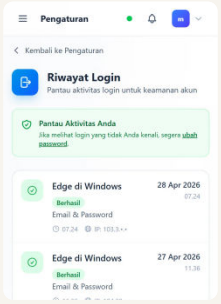
Write once, get a threaded answer with attachments by email and in the app; staff triage by programme and state.

ANY PHONE

Support without passwords

Staff view the app as an applicant to reproduce a problem, under a banner, with a one-tap exit.

PEOPLE DECIDE



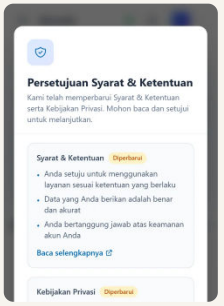
Their own login history



Leaving: step 1 of 3



Step 3, deliberate



Terms with versions

LEARNED *a review of my own system cannot be independent, so the report says so first and traces every finding to code.*

NEXT The largest programme on the engine: Sobat Bumi, and how every application was read fairly.

Sobat Bumi: every application, read fairly

WHAT IT IS Sobat Bumi is the foundation's flagship need-based scholarship for university students across Indonesia. Its selection reads every application with AI notes and human verifiers, then meets candidates in interviews and group discussions at their own campus.

Discover.

Tens of thousands of students apply for a need-based scholarship. That is more than any panel can read carefully, and a skim is unfair to the applicants who need it most.

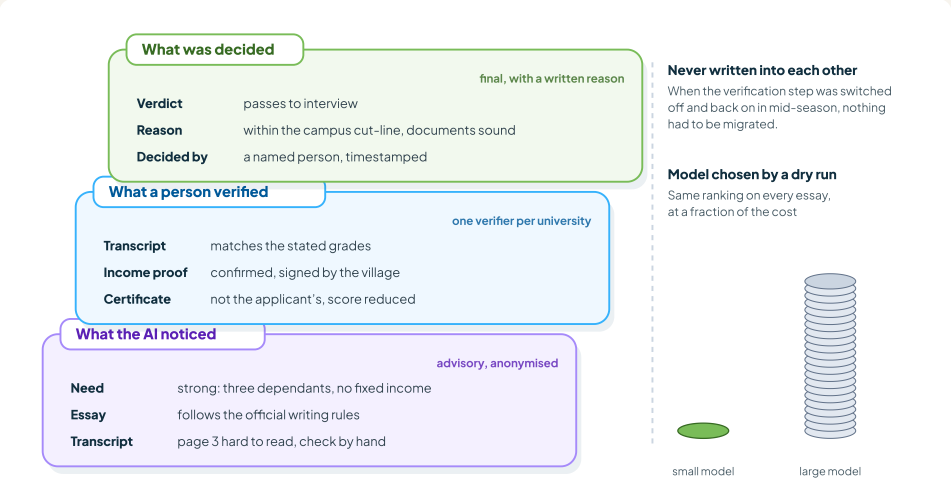
Design.

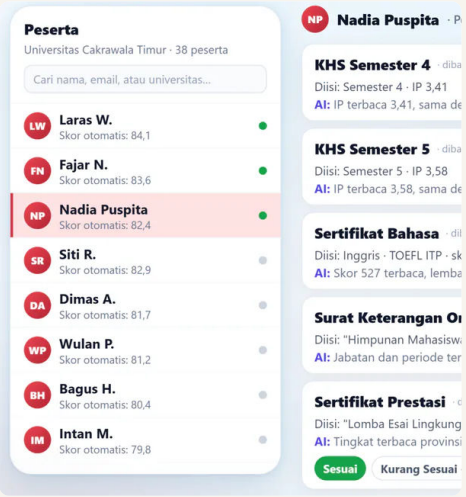
Five steps before anyone meets a candidate, then interviews and group discussions judged by hundreds of people who never made an account.

Deliver.

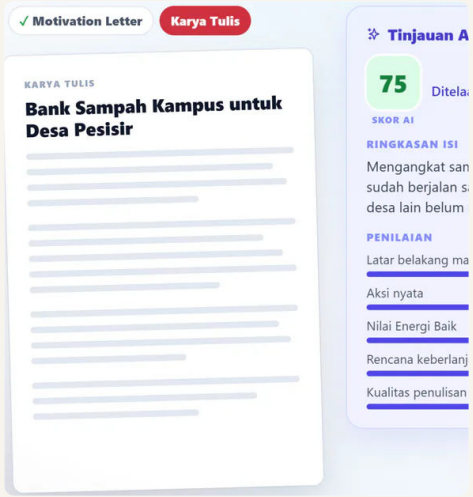
Scholars chosen with a written reason behind every decision, matched name for name to the signed decree.

AI READS, A PERSON DECIDES: THREE SHEETS ON EVERY APPLICATION, NEVER WRITTEN INTO EACH OTHER





The verifier's screen: each document beside what the AI read in it; the verifier confirms or overrides. Example data.



Notes beside each essay answer, for a person to weigh. Never a verdict.

WHY IT READS FAIRLY

Need before merit

The AI reads anonymised answers with a need-first rubric: hardship counts most, and achievement can only add, never take away.

PEOPLE DECIDE

Three layers, never mixed

What the AI noticed, what a person verified and what was decided live apart, so a policy could change mid-season without touching the others.

KEPT APART

Documents read safely

Scans are read only after text extraction and redaction; identity cards never go to the AI at all.

ON THE RECORD

The model chosen by a dry run

A small model gave the same ranking as a large one on every essay, for a fraction of the cost, so the small one did the work.

ANY CROWD

The AI never decides who gets a scholarship. It writes notes; a named person decides, and every decision carries a written reason.

1 One long form
Steps in any order, saved as you go; every file confirmed stored before it counts.

2 An automatic score
A rubric set as configuration; every disqualification stated with its reason, never deleted.

3 AI reads the essays
Notes beside each answer for a person to weigh. Never a verdict.

4 A verifier per campus
Each document beside what the AI read in it; the verifier confirms or overrides.

5 A final decider
Every judge's view on one card, then Lolos or Tidak Lolos with a written reason.

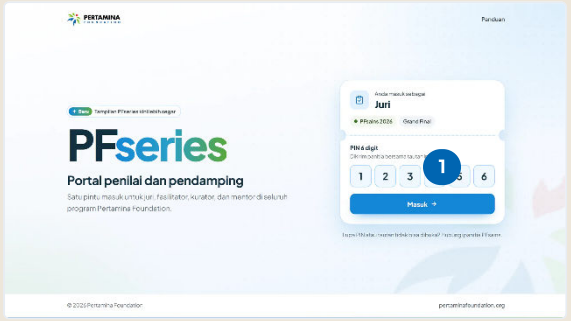
LEARNED *deadline week exposes every missing index, so hot lookups get indexed and audited before a programme opens, not during the rush.*

NEXT Then the people who met the candidates: 500+ judges across dozens of universities, none of whom made an account.

1

500+ judges, no accounts

After the reading, candidates met judges from the foundation, Pertamina and their own university: interviews, then group discussions. Hundreds of outside judges would normally mean hundreds of accounts to create and revoke. Instead, every seat opens from one link.



The judge's door: a ticket for one seat, one PIN.



The interview form, beside what the candidate claimed.



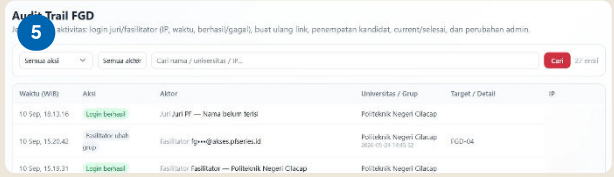
Group discussion: every candidate, every aspect, a tap each.



Each level described in words.



The facilitator hands out seat links, never accounts.



Every change on the record: who, what, when, which seat.

1 One link, one PIN

Each judge's seat opens from a link stored only as a fingerprint and a six-digit PIN. It locks after repeated wrong tries and expires after one scoring day.

ON THE RECORD

2 A tap is a saved score

Each tap saves at once, and if a save fails the cell rolls back, so the screen never shows what the server lacks.

ANY SIGNAL

3 Levels described in words

Each score level carries a sentence of what it looks like, so judges from different campuses score alike.

PEOPLE DECIDE

4 Seats that follow the schedule

Panels are derived from each group's campus, date and session; the facilitator hands out seat links, never accounts.

KEPT APART

5 Every change on the record

Who scored what, when, from which seat: an audit trail staff can read, judges cannot edit.

ON THE RECORD

The decree is the truth

The final list was checked name by name against the signed decree; the script refused to run until they matched.

ON THE RECORD

0

accounts created for 500+ outside judges

LEARNED *the programme team's final list outranks the system's ranking, so reconciliation scripts match by email, state each reason and keep backups.*

NEXT PFmuda went further: a stage with no interviewer in the room at all.

PFmuda: an AI interviewer every team shares

WHAT IT IS PFmuda is the foundation's youth programme: student teams propose an idea for their own region and compete for funding and mentoring. Its Case Challenge replaces the live interview with an AI one: an AI narrator reads each team a case, the team answers on camera, and AI turns every answer into a transcript and notes for the panel, who decide.

Discover.

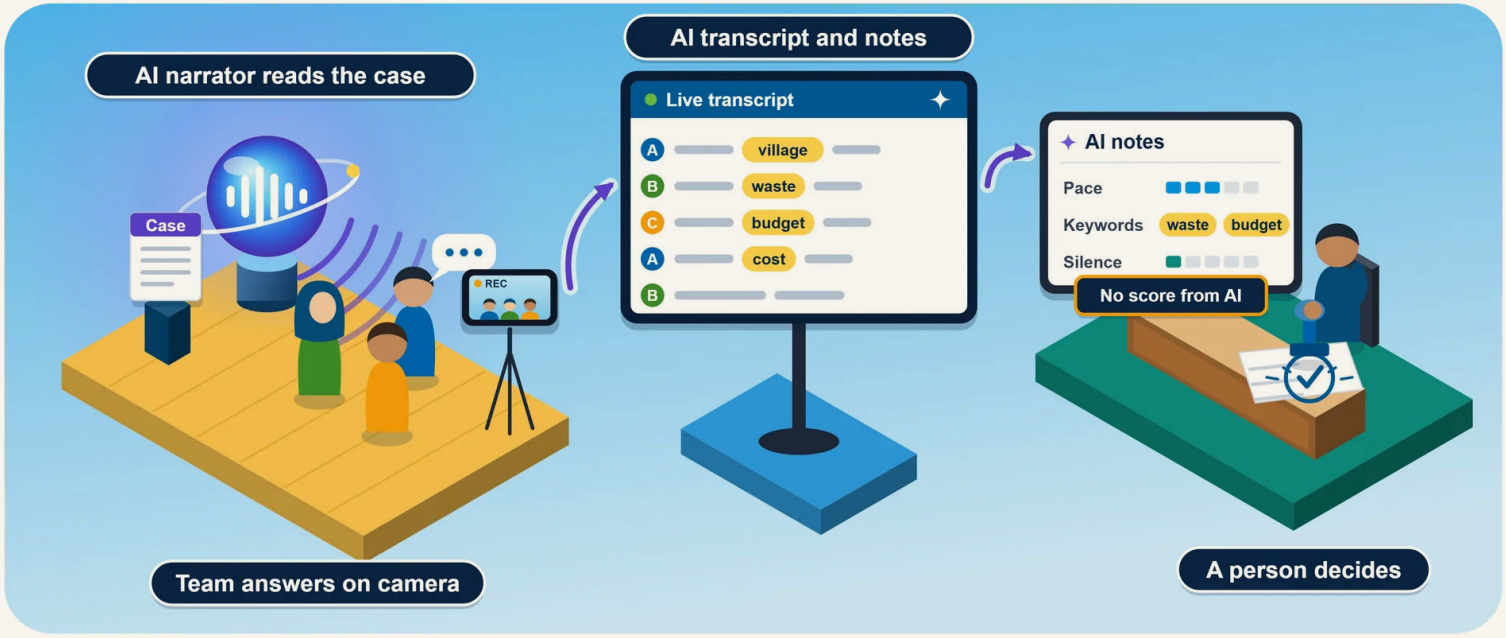
Interviewing hundreds of youth teams across Indonesia meant weeks of scheduling, a different interviewer for every team, and members who could not be in one room.

Design.

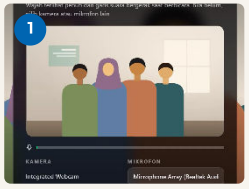
An AI narrator reads each team its case, AI transcribes and annotates every answer, and the panel decides with all of it in front of them.

Deliver.

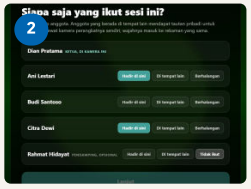
Nearly every invited team completed it with no scheduling, every team heard the same voice and the same words, and the panel read transcripts instead of rewatching hours.



ONE SESSION, AS THE TEAM SEES IT



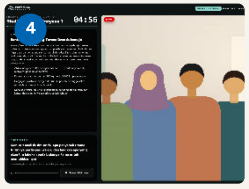
Camera and mic



Who is here



One frame, two places



The case, read aloud



The answer



Proof it arrived

An AI narrator, the same for all

Every team hears the same voice read the same words; the answer clock never runs while it speaks, and it counts down aloud.

PEOPLE DECIDE

AI transcripts that know who spoke

Each voice stays one person across every take, so the panel reads who said what instead of rewatching hours.

PEOPLE DECIDE

AI notes, never a score

Pace, silences and the points each answer covered, beside the video. The rule in the code: no score, no ranking, no recommendation.

PEOPLE DECIDE

No scheduling at all

Teams start whenever they are ready inside a window of a few days, from anywhere in Indonesia, after a rehearsal proves their setup.

ANY CROWD

LEARNED *phones throttle timers in the background, so every recording is timed from a wall-clock end, never from a countdown.*

1

What the AI does, and what it never does

The AI does what no panel can do at scale: read every team the same case in the same voice, and turn hours of answers into minutes of reading. The panel decides.



The panel's screen, redrawn with example content: the recording, the transcript, the AI notes, and the score only a person gives.

No score, no ranking, no recommendation from the AI. A named judge scores, with a reason.

A narrator rendered when the case is saved

Staff type the case; its AI voice is generated and stored at once, and a case locks once any team has answered it.

KEPT APART

Transcripts that keep each voice one person

Every take transcribed with speakers matched across takes, so the panel reads who said what.

PEOPLE DECIDE

Notes counted on our side

Pace and silence are measured locally; the model only marks which points each answer covered.

ON THE RECORD

TEAMS WROTE IN THE AFTERNOON; THE FIX SHIPPED THAT EVENING

"Saat kami membaca permasalahannya sudah dimulai sesinya."

We were still reading the problem when the session started.

Fixed: Sixty seconds of reading time after the case is read out.

"Suara AI terlalu pelan."

The AI voice is too quiet.

Fixed: Every narration clip remixed louder that night.

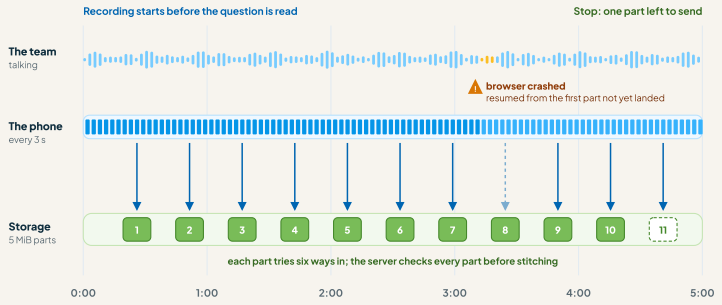
"Suara dan wajah ketua tidak terlihat di laptop teman yang jarak jauh."

The remote teammate got neither the leader's voice nor face.

Fixed: The room now watches what actually arrives and reconnects a silent device by itself.

UNDERNEATH: A RECORDING THAT SURVIVES A BAD SIGNAL

Saved on the phone every few seconds, sent in parts while the team talks, resumed after a crash: nothing recorded was lost, even on the first exam day.



PFpreneur: a classroom inside the selection

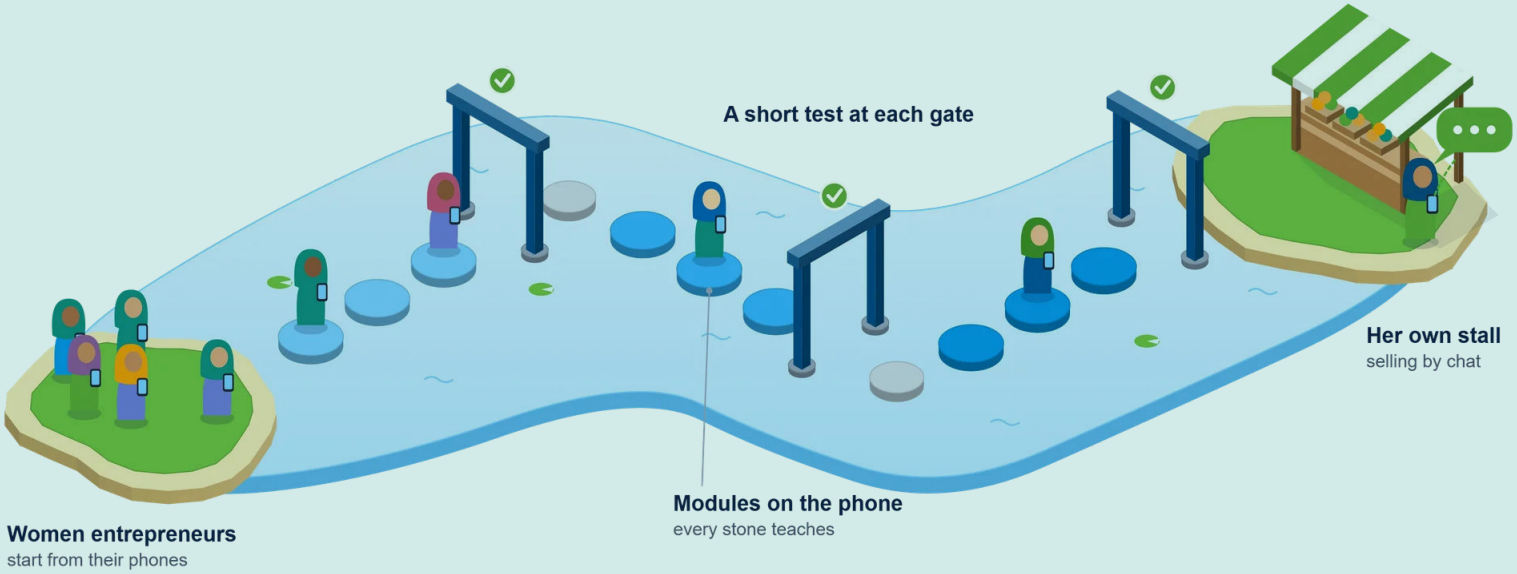
WHAT IT IS PFpreneur grows women-led small businesses. Its selection is also a course: entrepreneurs learn legality, governance and market access in short modules on their phones, take tests, and are judged on what they learn and build, ending in a public catalogue.

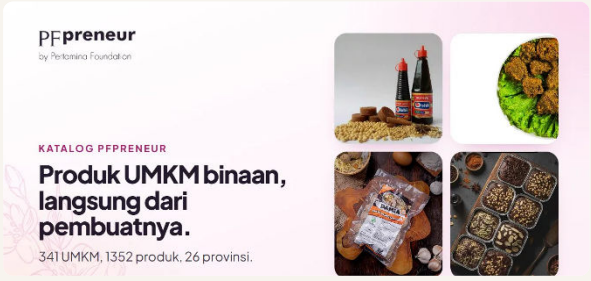
Discover.
Thousands of women entrepreneurs had to be taught and tested fairly, in teams, over four months, most of them on a phone between running a business.

Design.
Selection that teaches: phases of short modules, each a pretest, a class, a posttest and an assignment, ending in certificates that verify themselves.

Deliver.
Finalists chosen through months of learning rather than one form, then a public catalogue that sells their products through WhatsApp.

Stepping stones, gates between them, and her own stall at the end.





Where it ends: a public catalogue where checkout is a chat message already written.

Tests the server keeps the time for
Start and end stamped on the server, each person's shuffled order kept, answers saved as she goes, no second submission.
ANY SIGNAL

Attendance by a typed code
The presenter shows a short code in the live class; she types it into the module she is already on. Spacing and case still match.
ANY PHONE

Modules as data
Each module carries its pretest, class, posttest and dates; staff build question banks in Excel.
KEPT APART

Find a team
Solo entrepreneurs find teammates by sector and province; the listing closes itself when the team is full.
PEOPLE DECIDE

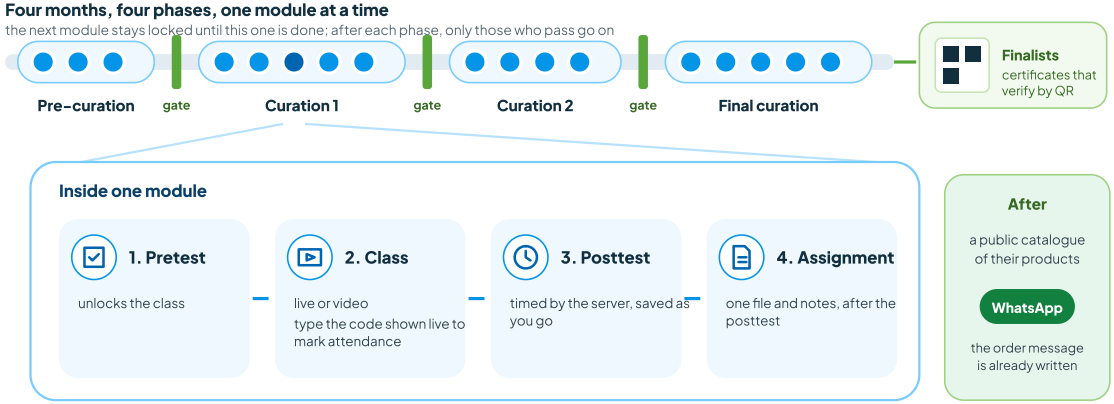
LEARNED *a start time kept on the phone can be lost or faked, so the server stamps each test and autosaves answers.*

NEXT Inside the classroom: how a phase of modules is built, run and closed.

1

Phases of modules, gates between them

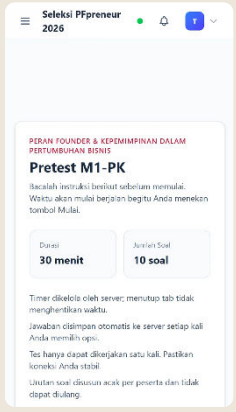
Selection that teaches: thousands of entrepreneurs learn legality, governance and market access, and are judged on what they learn and build. The classroom, the tests, the mentors and the final panel live on one platform, so nothing is copied between systems.



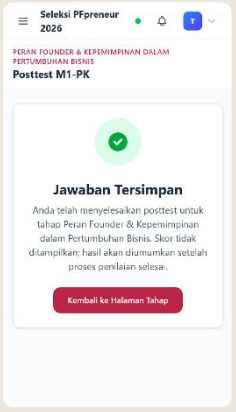
Teams of three to five women, each filling her own business form and taking every module herself. Staff preview every module as a participant would, with a switch to simulate each state.



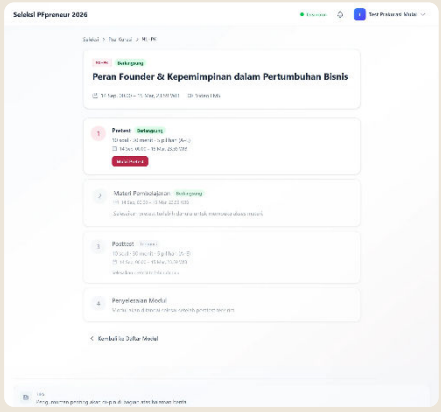
Modules behind gates



A test the server times



Received, on the record



Inside a module: pretest, class, posttest, assignment, the next one locked

Every state previewed first

Staff see each screen a participant can meet (module locked, all done, feedback sent, certificate) before release, without a real account.

PEOPLE DECIDE

Feedback closes each phase

Seven rated questions and four open ones, in the programme team's own words; mentors read what their participants said about them.

PEOPLE DECIDE

Progress staff can see

Assignments by person and module, submission timing charts, and the whole selection as one flow from registration to final.

ON THE RECORD

Exports with photos inside

The staff spreadsheet shows each owner's and product's photo in its cell, through links that refresh themselves.

ON THE RECORD

A certificate manager

One page per category: template, field positions, preview any finalist, release, official numbers; each with a QR to its record.

ON THE RECORD

A catalogue that sells by chat

After selection, a public catalogue where checkout is a WhatsApp message already written, one per maker.

ANY PHONE

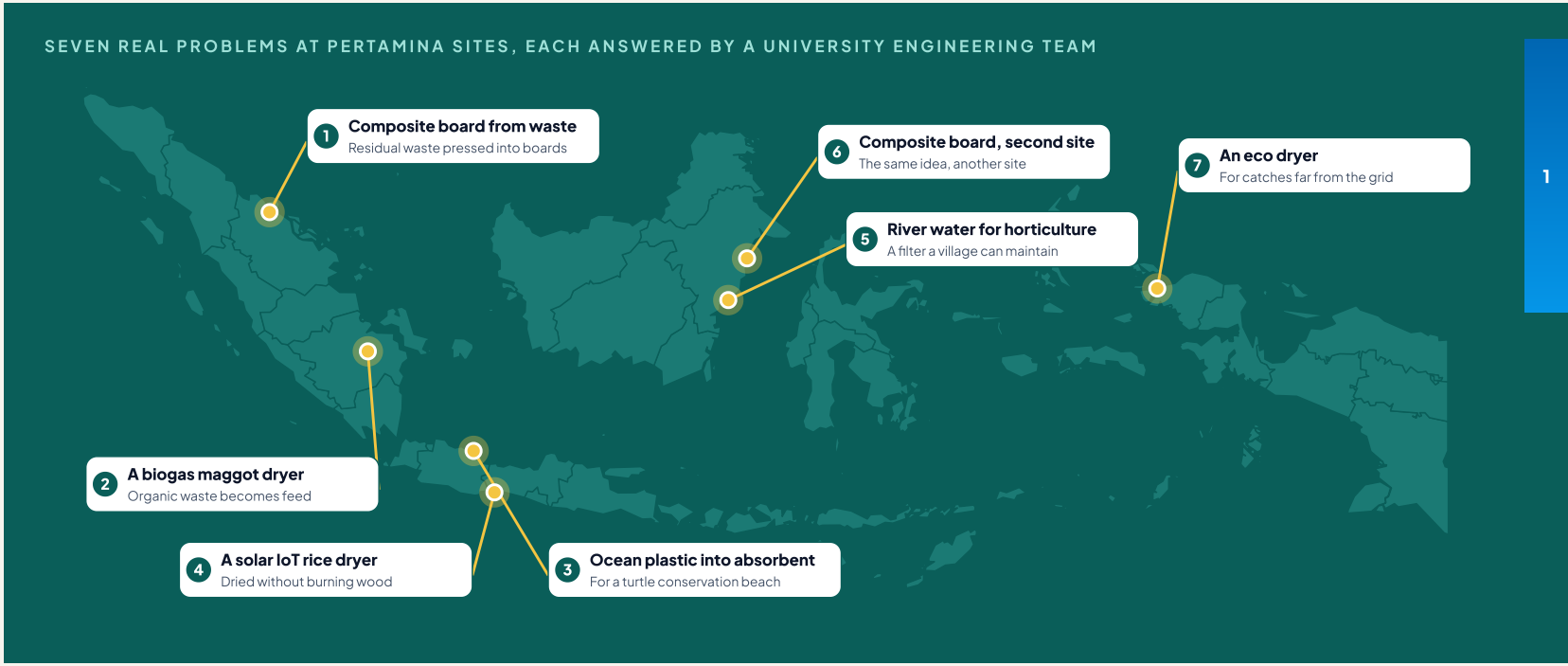
PFsains: innovation money for real sites

WHAT IT IS PFsains funds university engineering teams to solve a real problem at a Pertamina operating site, such as energy, food or waste in a named village. Kurators judge proposals per case study, then a desk evaluation and a grand final decide the funding.

Discover.
Innovation proposals reached reviewers outside their field, and funding decisions lived in a separate sheet from the verdicts.

Design.
Kurator seats scoped to one case study, a desk evaluation, and a grand final where the final decider sets the approved budget beside the verdict.

Deliver.
Finalists judged by the right experts, and funded teams whose budgets are tied to their own plan.



7 real problems, each owned by a Pertamina site

2 kurators per case, each seeing only the case they know

1 sheet for the verdict and the money

1 Proposals filed under a case study

2 Kurasi two kurators per case

3 Desk evaluation evidence, then a panel

4 Grand final pitch, judges, a host

5 Funding verdict and approved budget



The grand final sheet: levels, a pass line, a note the judge must write, and the budget beside the verdict.

Seats scoped to one case
A kurator's link opens only the proposals of their case, late submissions included. No per-proposal assignment to maintain.

PEOPLE DECIDE

A drawer for the misfiled
The other cases sit beside the form, so a proposal filed under the wrong case is still judged against the right one.

PEOPLE DECIDE

Decisions at keyboard speed
The final decider sees both kurators' forms side by side and moves with the keyboard, with agreement and spread statistics a click away.

PEOPLE DECIDE

Evidence slots that save alone
Test results, specifications and the pitch deck each save on their own, so one failed upload never costs the rest.

ANY SIGNAL

A host page for the final
The host opens each team's deck full screen to share; judges score in a kiosk view from one link.

ANY PHONE

The budget beside the verdict
Approved funding is set next to each decision, filled from the team's own plan and flagged when it goes over.

ON THE RECORD

LEARNED *closing registration and closing submission are separate decisions, so each is its own date in data, not a code change.*

NEXT Behind these programmes sits machinery first proven on the smallest scholarship.

1

The smallest scholarship became the template

WHAT IT IS Smaller programmes, such as the PPN maritime diploma scholarship and BSBK for school leavers in Kalimantan, run on the same machinery. Each mechanism was built once for one programme and reused by the others, so a new programme launches in weeks.

Discover.

Each new scholarship arrived with its own rules and a deadline weeks away. Building each from scratch would have meant a new system, and new bugs, every month.

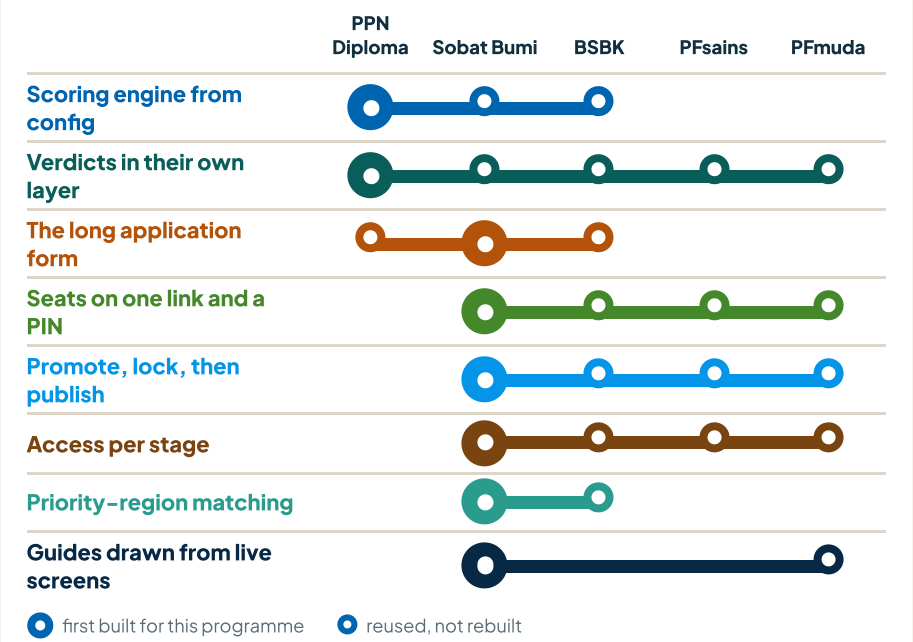
Design.

The scoring engine, the verdict layer and the guarded scripts were piloted on a small merchant-marine scholarship, then carried the largest one.

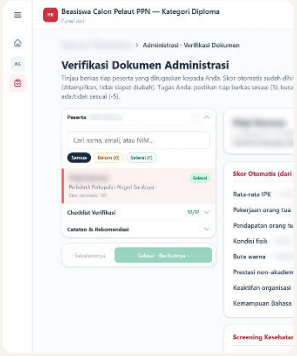
Deliver.

New programmes launched in weeks on shared machinery, including one that went through five revision rounds with its sponsor.

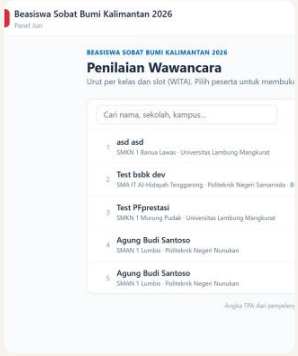
BUILT ONCE, RIDDEN BY EVERY PROGRAMME AFTER IT: EACH LINE STARTS WHERE THE PIECE WAS FIRST BUILT



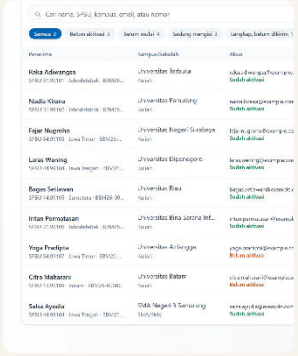
THE SAME MACHINERY, WEARING EACH PROGRAMME'S COLOURS



PPN: the verifier's desk



BSBK: the interview list



BBM: what each recipient still lacks

PPN: future ship crew

Merit, not need. Health gates come first, each disqualification shown with its reason, then two blind judges per document. The pilot for the scoring engine.

PEOPLE DECIDE

BSBK: school leavers in Kalimantan

The sponsor's priority area is a list of villages, matched by official village code; any it cannot resolve goes to a person, never forced. Aptitude and wellbeing results sit beside the interview.

ON THE RECORD

Three ways in

Open registration, invitation from an imported sheet for cadets already scouted, and nomination by regional teams, on the same form engine.

KEPT APART

PROGRAMMES THE ENGINE TOOK ON LATER

Volunteers, with a classroom stage

Disaster relief volunteers selected with a learning stage inside the selection, on the same engine.

KEPT APART

Invitation-only rounds

Past winners invited back for a continuation round; groups without email join by a personal link.

ANY SIGNAL

Accounts made for the recipient

Staff import the committee's list; each recipient activates from a single-use link and fills four parts that save themselves.

ANY PHONE

A season, and what broke

WHAT IT IS One selection season on the platform, told month by month: what was planned, what broke under load, and the fix that went out each time, with the guarded scripts and journals behind every change to live data.

Discover.
A platform that works on a quiet Tuesday can still fail on deadline night, in front of thousands of applicants, with nobody able to see why.

Design.
Twelve breaks that mattered, each fixed at its root, and one rule: nothing touches production data by hand.

Deliver.
Each break fixed so it cannot happen the same way twice, and not one production change made by hand.



1. **23 Apr. Uploads die at 0% on some carriers.** Six ways in, built in a single day.
2. **27 May. The error logger starves the database.** Its writes switched off, one channel kept.
3. **28 May. Deadline rush: a save takes up to 60 s.** An index, and unsaved work shown with a timer.
4. **28 May. The email engine eats 7 GB in waves.** Seven small counts and an index.
5. **1 Jun. Files that never reached storage.** Checked at submit; lost links restored, a day to fix the rest.
6. **1 Jun. Dashboards run out of memory at scale.** Streamed in pages, minutes became seconds.
7. **7 Jun. Uploads fail while health stays green.** A fourth leg on the heartbeat.
8. **30 Jun. The decision list times out at full scale.** Hundreds of requests became a handful.
9. **13 Aug. More passed than on the programme's own list.** Reconciled by email, each change with a reason.
10. **18 Aug. The audit log is empty in production.** Writes the runtime is told to wait for.
11. **16 Sep. Exam morning: big recordings will not send.** A parser shim shipped at 10.29.
12. **4 Nov. A Cloudflare error mid-way through the final list.** Stopped before locking, then resumed.

THE HABIT BEHIND EVERY FIX

Production data is somebody's scholarship.

So nothing touches it by hand: 248 scripts, each written to be safe to run twice and impossible to run carelessly.

1	**Dev unless told**	Every script runs against the dev server unless given --prod.
2	**Dry run first**	It prints what it would change before it changes anything.
3	**Backup before write**	A JSON copy of every row it will touch, written first.
4	**Refuse when unsure**	Its own guards stop it: an unmatched name, a count that differs.
5	**Journal after**	Date, row counts and commit, in the programme's state journal.

What applicants see instead
During any repair, a calm page that says the site is back soon, with a retry button, switched on without a release.
ANY CROWD

Errors that say what to do
A failed upload names its fix in one sentence: close the file in Word, or pick it from phone storage instead of a cloud drive.
ANY PHONE

Did you mean gmail.com?
After hundreds of accounts were lost to typos, one prompt at sign-up now catches the typo before the account exists.
ANY PHONE

LEARNED *deadline night is no time to improvise, so every production change runs as a script with a dry run and a backup.*

NEXT After the final list, the chosen move on: how a list of names became signed scholarship contracts.

1

The list becomes a contract

WHAT IT IS Beasiswa Pertamina is the scholars' own app after selection: invitation, re-registration, a digital contract signed on the phone, then reports, grades and payments for the years of study.

Discover.

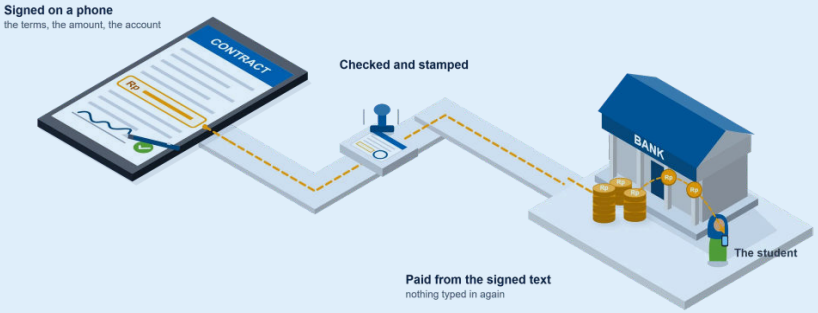
Selection ends with a list of names. Between that list and the first payment sit contracts, bank details and forms that, done by hand, invite retyping errors and disputes over what was signed.

Design.

The scholars' own home after selection: data imported, a contract signed on the phone and checked at the moment of signing, payments priced from it.

Deliver.

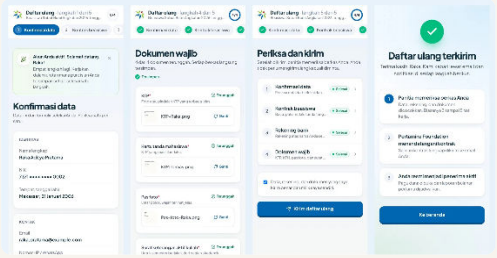
Every new scholar onboarded without retyping, each contract checked at signing, and payments generated from what they signed. Built in about a month.



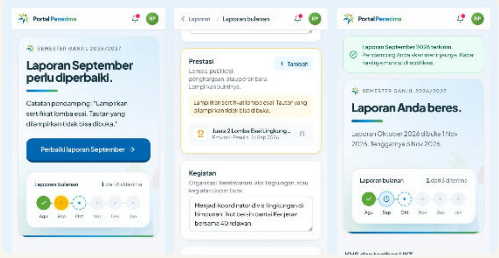
From a decree to money in a student's account, without one number retyped.

1. **The decree** imported, nothing retyped
2. **Invited** with the guide attached
3. **Re-registration** data, documents, bank
4. **Contract signed** on the phone
5. **Payments** priced from that contract

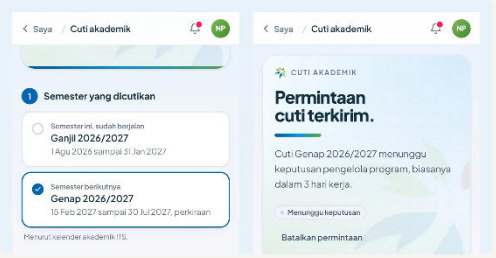
THE YEARS AFTER SIGNING, ON THE SCHOLAR'S PHONE



Re-registration in four steps

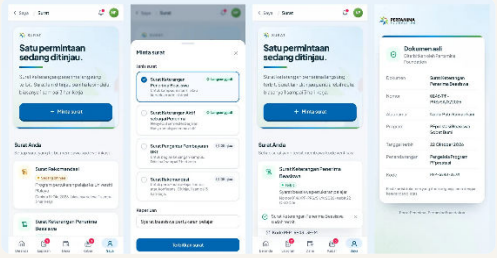


Monthly reports, revised with a reason

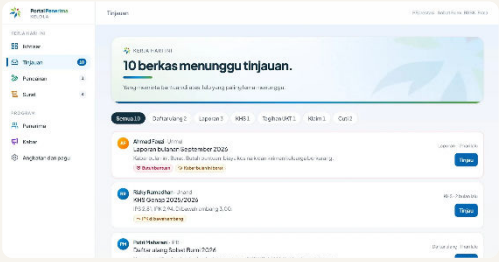


Study leave, requested and approved

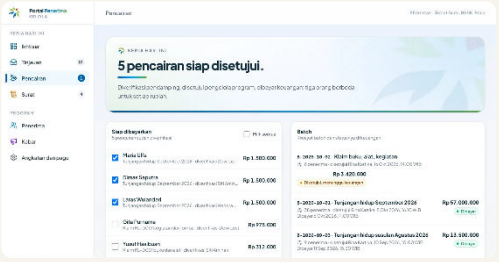
AND WHAT STAFF SEE



Letters anyone can verify by code



What waits for review, by scholar



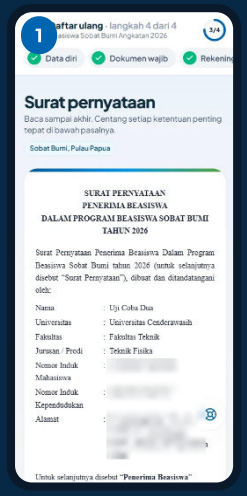
Payments prepared in one batch for finance

LEARNED *a signed text must never change under its signer, so a correction becomes a new version that only unsigned scholars receive.*

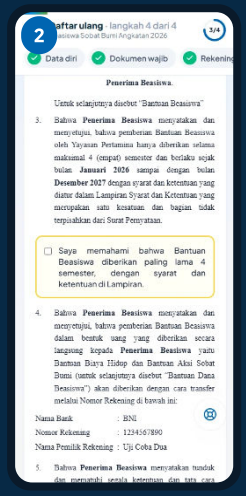
NEXT Signing, up close: one text, checked to the character.

One text, checked to the character

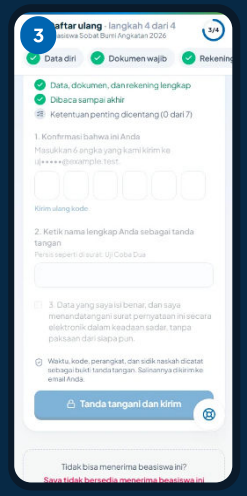
A scholarship is a legal promise with money behind it. If a scholar signs one text and finance pays from another, the promise breaks. So the contract is Legal's exact words, checked at the moment of signing, and the payments come from that signed text, never typed.



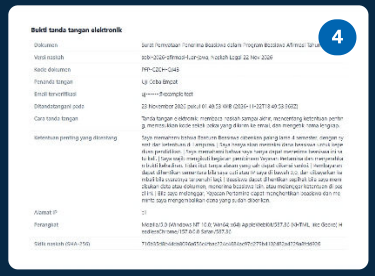
Legal's words, her data



Each clause ticked



A code, then the name



The signed copy carries its evidence: who, when, and a fingerprint of the exact text.



Staff side: the scholar's dossier, with payments generated from her own signed contract.

If one character of the contract differs from what she read, the server refuses the signature.

1 Legal's own words

Contracts converted word for word from Legal's files, one version per track and campus region. A signed text is never edited; a correction becomes a new version for those who have not signed.

ON THE RECORD

2 Read, then acknowledge

Reading is measured from the scroll, and every clause that matters has its own box to tick.

PEOPLE DECIDE

3 A code, then the full name

A short-lived code to the verified email, rate-limited and stored hashed, then the full name typed as on the ID card.

ON THE RECORD

4 Checked at the moment of signing

The phone sends a fingerprint of the exact text it showed; the server rebuilds the text and refuses if one character differs. Anyone can verify the signature by code.

ON THE RECORD

Money from the signed text

Signing creates the payment schedule, each amount from that scholar's own contract. Finance checks every bank account before money moves.

KEPT APART

Tested on the live site, safely

A launch test walks the real site as one fake scholar, refuses to act if it sees anyone else, and removes every trace afterwards.

ON THE RECORD

LEARNED *each selection-season failure taught a rule, so the scholar app started with those rules, domain tests and a gated pipeline.*

NEXT That closes Part 1. Part 2 turns from one platform to the rest of the organisation it runs in.

PART 2

Running a foundation on software

The same habits, pointed at very different problems

PFSeries shows depth. This part shows range inside the same organisation: staff work, AI, live events, money, servers and the documents that let others build.



29 **PFdrive**
A dozen jobs spread across forms, chats and sheets



32 **Kira and the AI work**
Skilled people spending hours listening and reading



33 **Prototypes and UI/UX**
Ideas nobody can judge from a slide



36 **Events and big screens**
Live moments where nothing can go wrong



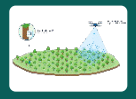
38 **Grant monitoring and disbursement**
Money out, and no way to prove who changed what



40 **Infrastructure and operations**
A small team, national peaks, a small budget



43 **Architecture documents**
A system only one person could explain



45 **Forest, tags and vision**
Trees that cannot be found or checked again



At the foundation's Digital Initiatives booth, 2026: PFSeries 2.0 and PF Lestari on the wall, the LiDAR drone in hand.

NEXT First PFdrive, the system staff open every morning, because everything else in this part either lives inside it or feeds it.

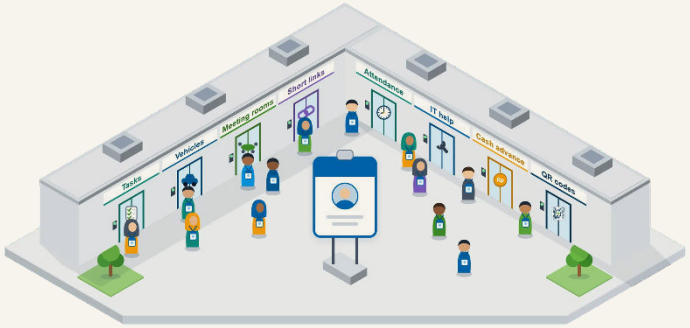
PFdrive: the staff system

WHAT IT IS PFdrive is the foundation's internal staff system: one login for programmes and tasks, approvals, IT help, cash advances, attendance and live questions, meeting rooms, short links, broadcasts and file tools.

Discover.
Daily work was spread across separate tools: forms for attendance and prize claims, a separate publications site, IT requests on paper or WhatsApp, cash advances in spreadsheets, and no single view of programme progress.

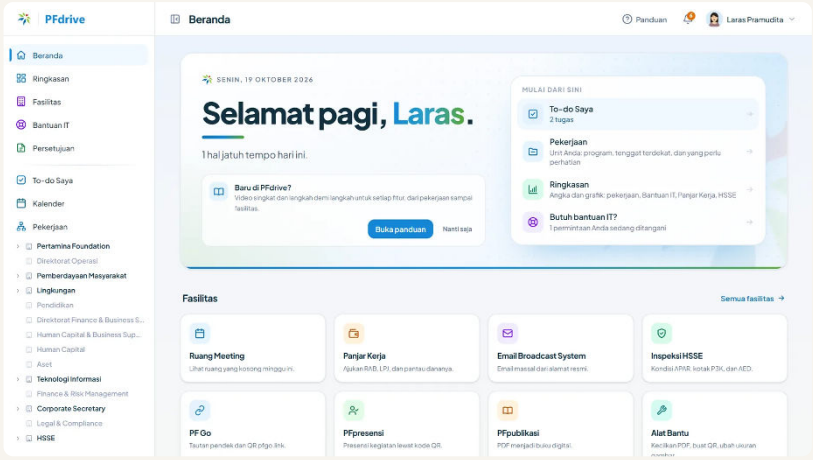
Design.
One login, one programme tree and one permission model, with a module for each job. It grew from a task tracker into the system staff open for nearly everything.

Deliver.
One staff system live on several addresses, with modules that replaced forms, spreadsheets, paper and chat threads.

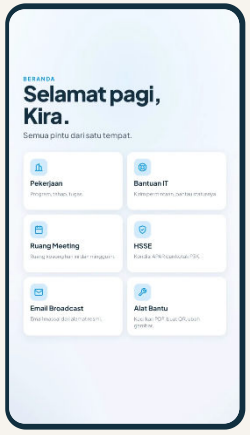


One badge
opens every door

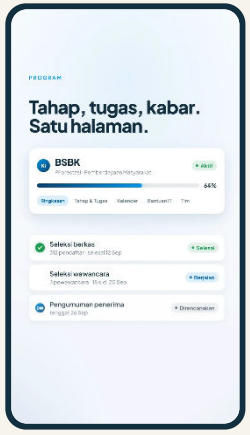
Permissions follow the programme tree, not job titles, and every list is filtered on the server: hiding is not scoping.



Home: a greeting, today's work, a door for each job. One office login, installable on a phone.



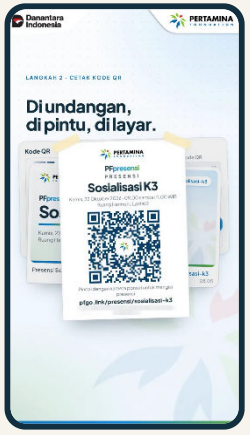
On a phone



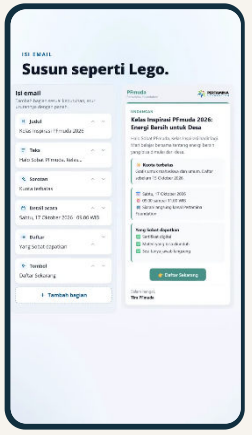
A programme



A cash advance



An event



A broadcast



A QR code

Programmes, Gantt, approvals
Programmes as a tree with stages and approvals; anything awaiting a signature waits in one place.
PEOPLE DECIDE

IT help from a sticker
A QR on each printer opens a request already labelled; guests can report without logging in.
ANY PHONE

Cash advances
From budget to report, no one approves their own, and printouts carry a QR to verify.
ON THE RECORD

Attendance and live questions
One link per event: check in, ask any speaker, upvote; the chosen question fills the projector.
ANY CROWD

Meeting rooms from the calendar
Rooms booked against the office calendar; the room's TV shows its own agenda.
ANY PHONE

Work boards, open to AI
Sprints and stand-ups that AI assistants can update through the same permissions. Done stays with the person.
PEOPLE DECIDE

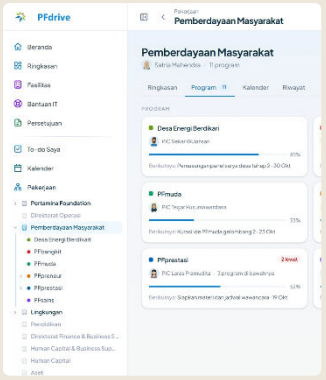
LEARNED *job titles make poor permissions, so a person's seat in the programme tree decides what they can see and do.*

NEXT A day at the foundation, hour by hour, inside that one system.

A day at the foundation, inside one system

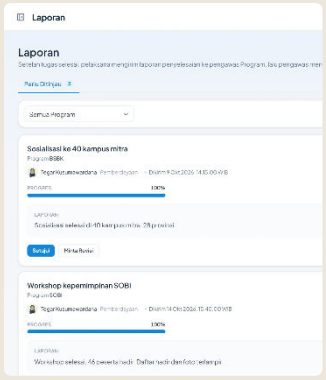
A programme officer's day, from morning to evening, left to right along the line: every job below used to live in a different form, chat or spreadsheet. Example data.

07:30
The programme tree



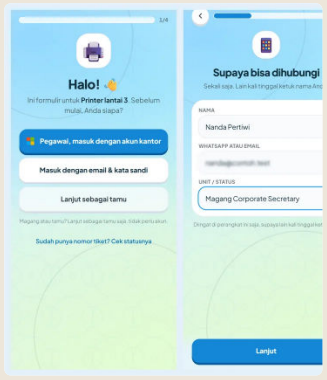
Every unit, programme and stage; your seat decides what you see.

08:30
One approvals inbox



Anything waiting for a signature, in one place.

10:00
IT help from a sticker



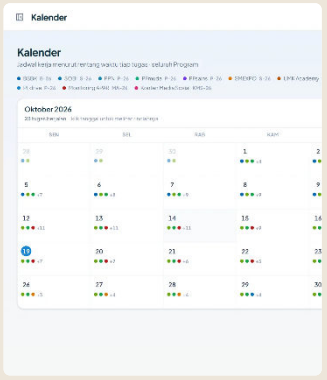
Scan the printer's QR: the request arrives already labelled.

11:00
Live polls and Q&A



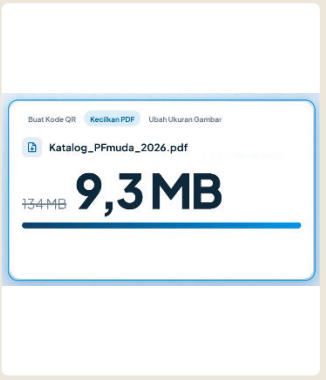
One code on the screen; the room joins from their phones.

13:30
One calendar of events



Every programme's dates on one shared calendar.

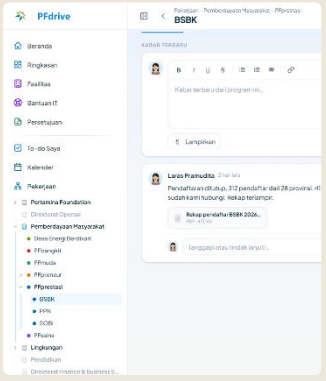
15:30
File tools that never upload



Compress and merge PDFs on the device; the file never leaves it.

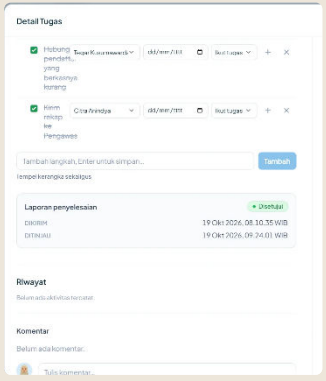
07 08 09 10 11 12 13 14 15 16 17

08:00
Updates, not meetings



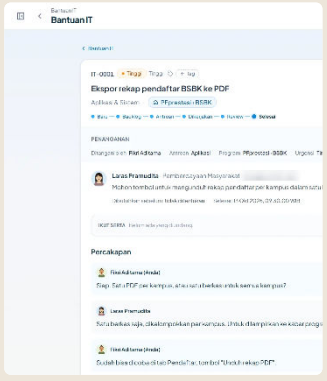
Progress posted where the work lives, approved by a supervisor.

09:15
A trail on every task



Who asked, who did, who approved, and when.

10:20
A ticket that talks back



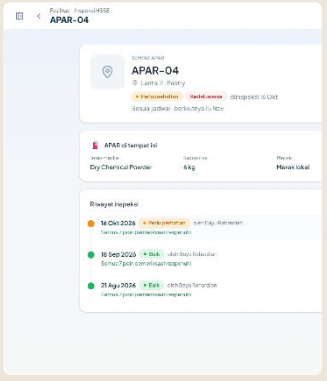
Two-way chat and a staged queue; the clock is read from the system.

11:30
Moderated, then shown



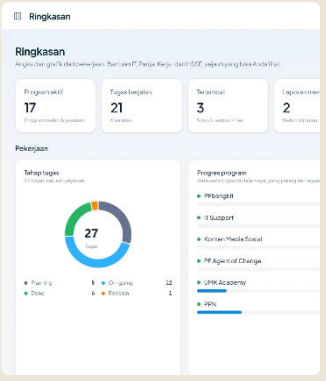
Answers wait for a moderator before they reach the screen.

14:30
Safety checks by QR



Extinguishers and first aid kits open their own inspection log.

16:45
A summary that fills itself



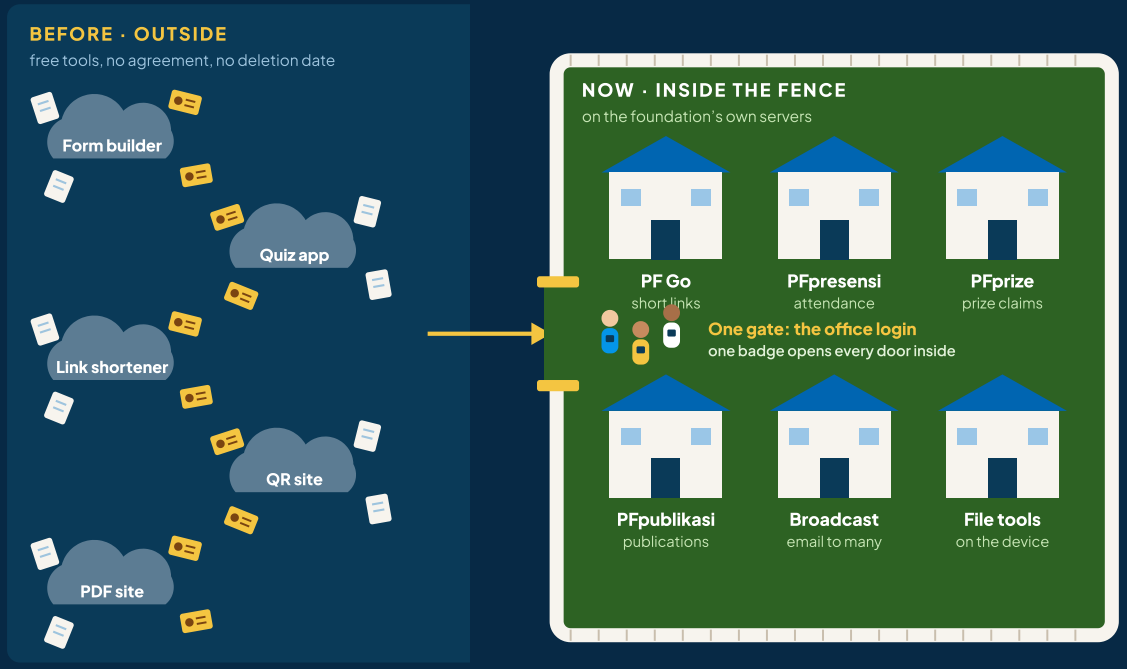
Daily work moves the numbers; nobody types a month-end recap.

LEARNED *measure before moving anything: the lag was polling, not where the data lived, so screens now get a live signal instead.*

NEXT Why build it at all: to keep the foundation's data inside its own fence.

The foundation's data, inside its own fence

Staff work had leaned on free outside tools: form builders, quiz apps, link shorteners, QR and PDF sites. Answers, winners' ID cards and internal documents sat on other people's servers with no agreement and no deletion date. Each of those jobs now runs inside, behind one door.

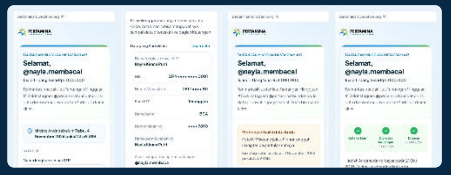




PF Go: counted, never tracked
Clicks by day, rough city and device; no visitor address stored.



PFpresensi asks first
Consent per purpose before a single answer is stored.



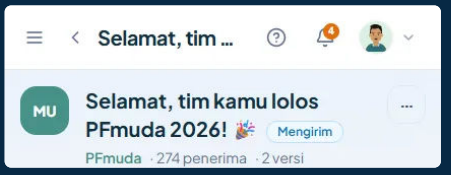
PFprize: one link per winner
Never shortened, never shared; it opens only that winner's claim.



ID photos that delete themselves
Gone after the handover; the prize history stays.



PFpublikasi: read like a book
Publications as page-turning books, searchable, on our own servers.



Close the phone; it keeps sending
Throttled batches on the server, tracked per person.

Answers, winners' ID cards and documents now stay on the foundation's own servers, each with a date when it is deleted.

A poster that outlives its link. Pause, end or move a link in seconds; a friendly page explains.

Attendance that forgets. Answers anonymised after the event, on a stated date.

A hall checking in at once. One QR on the projector, a live count, no double taps.

Who read what, in aggregate. Pages read and time spent, never who read them.

Broadcasts, reviewed first. Paste the WhatsApp text; it becomes an on-brand email, tested before it goes.

Registered to the foundation. The short domain belongs to PF, not to a person who might leave.

Applied AI, people decide

WHAT IT IS Applied AI at the foundation: a voice interviewer, a competency assessment, a CV filled in by talking, a dress-code mirror and meeting minutes from recordings. Each hands a person a draft or a score to review; none of them decides.

Discover.
Screening interviews exhaust panels, competency assessments need trained assessors, and meeting minutes arrive late and incomplete. Each is a listening or reading job that eats skilled people's time.

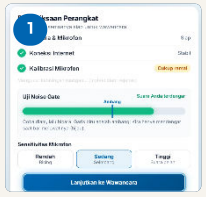
Design.
Tools that hand people a draft, a transcript or a score to review, and leave every decision with a named person.

Deliver.
An interviewer shown live to Pertamina's CEO and President Commissioner, and meeting minutes at cents an hour.



THE FOUNDATION'S 15TH ANNIVERSARY

Kira on the screen, me at the laptop, Pertamina's leadership listening.



The room's noise measured first



The candidate answers out loud



Kira reads; it does not decide



A named person decides

Kira

A voice in the browser that interviews, reads and drafts. It scores on six dimensions for people to weigh, **and never decides.**

Kira, the voice interviewer
A voice interviewer in the browser on OpenAI's real-time API; a room-calibrated noise gate makes it usable in a crowded hall. Scores on six dimensions go to people, not to a verdict.

PEOPLE DECIDE

Competency assessment
Kira asks behavioural questions and scores against the dictionary through structured calls and anchored scales. Built for a pilot.

PEOPLE DECIDE

A CV filled by talking
Kira as a career counsellor who fills them through conversation. A one-day proof of concept.

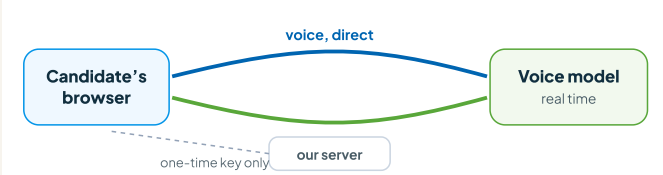
ANY PHONE

A mirror that checks the dress code
A mirror triggered by a hand sign, on a gesture model I trained, with a cost study of a cloud model against one run in-house. A proof of concept for management.

KEPT APART

Minutes from the recording
Meeting recordings become minutes in the house format for cents per hour of audio, with a guard against invented content. In use for real meetings.

PEOPLE DECIDE



Audio never touches our servers; only a one-time key does.

LEARNED *in a crowded hall the AI mistook noise for answers, so the microphone now sends silence below the measured room noise.*

NEXT Ideas like these reach leaders best as working prototypes, inside the app they already use.

Working prototypes, inside the app people already use

WHAT IT IS Working prototypes for Pertamina Group: features built inside copies of the employee app, so managers try them where they would live, and clickable frontends on sample data that settle requirements before anything is built.

Discover.

Leaders cannot judge an idea from a slide, and requirements written in a meeting mean something different to everyone in the room. A feature shown outside the app where it would live never feels real.

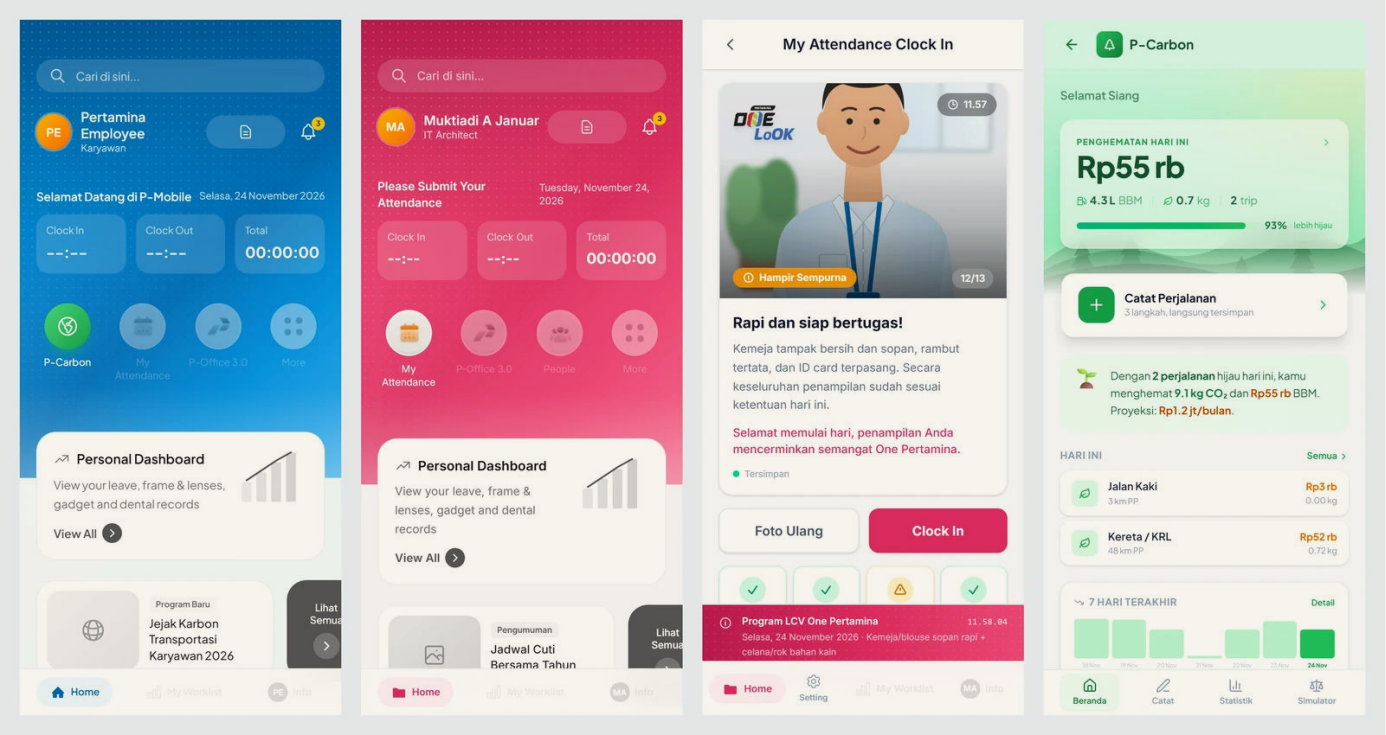
Design.

Working prototypes inside copies of the employee app, so a manager meets the feature where it would live, and frontends on sample data that let people walk their own process first.

Deliver.

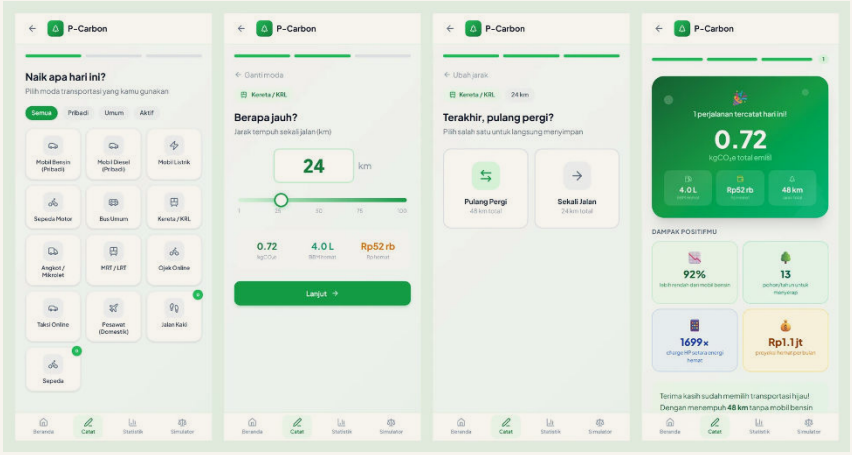
A carbon tracker Pertamina's HC team is taking toward the whole group, a grooming check shown as a booth, and prototypes stakeholders clicked through before anything was built.

P-Mobile is not mine; it is the group's employee app. I built copies of its shell to hold my prototypes, so a manager meets each feature exactly where it would live.



Two prototypes living in copies of the employee app: the carbon tracker as a module on the home grid, and a grooming check inside My Attendance.

P-CARBON, THE APP HC CALLED JEJAK KARBONKU: A COMMUTE LOGGED IN THREE TAPS



No login in the way

A device ID identifies the person, so the first trip takes seconds; signing in is optional.

ANY PHONE

The last tap saves

Pick a mode, slide the distance while the savings update live, tap round trip or one way: stored. No save button.

ANY PHONE

"Any other transit?"

A train then a motorbike taxi becomes one journey without starting over.

ANY PHONE

Results in human terms

CO_2 avoided as trees a year, phone charges and kilometres not driven, with a monthly projection.

PEOPLE DECIDE

Every factor shown

A reference page lists each emission factor and its source, so the numbers can be checked.

ON THE RECORD

A habit that spreads itself

A story card for Instagram and WhatsApp; trips save on the phone first and sync later.

ANY SIGNAL

LEARNED *a login wall stops casual participation, so the commute tracker works without login, tagging trips by device and saving offline first.*

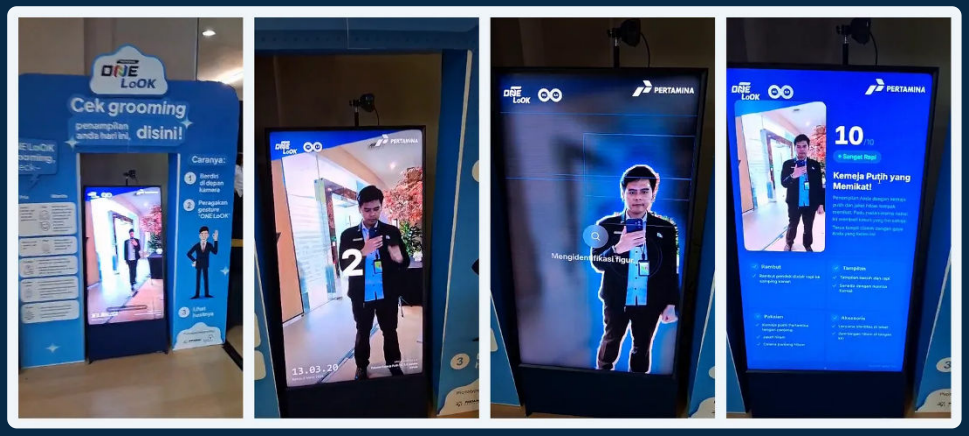
NEXT The second module in the same shell: a grooming check at clock in, and a mirror in the lobby.

A grooming check that coaches, at clock in and in the lobby

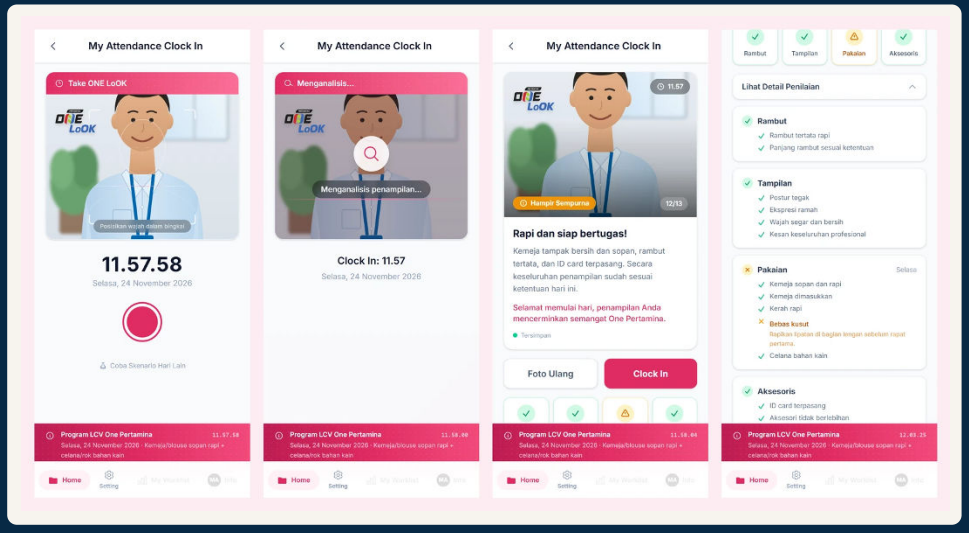
Pertamina's HC team wanted the group's dress code to become a daily habit, not a poster. In the first meeting I showed a mockup inside My Attendance and proposed keeping every photo on the device; they asked for it linked to clock in. It grew into a lobby mirror and a booth at an event.



Trying the booth at an event. I started the project and wrote most of it; teammates added hand gestures, a local model and a later theme.



The mirror in real use at an event: the booth, the countdown, the scan, the result.



At clock in: camera, analysis, a verdict that still lets you clock in, then the detail. Demo screens with a drawn stand-in and a scripted verdict.

Where the habit already is

The check runs on the Clock In button. It never blocks clocking in: retake, or clock in anyway.

PEOPLE DECIDE

Coaching, not judging

A warm headline, four categories, and a suggestion only for what failed; what the camera cannot see is greyed, never failed.

PEOPLE DECIDE

Dress code as data

Each weekday's code is configuration, shown in a band at the foot of the screen.

KEPT APART

A touchless mirror

Hold an OK sign for a countdown, swipe results with a gesture, reset after thirty seconds.

ANY CROWD

The wait made useful

While the AI works, the visitor logs today's commute, and both results show together.

ANY CROWD

Photos stay on the device

Proposed in the first meeting because of the data protection law, before a line was written.

ON THE RECORD



The mirror's result: four categories, one coaching tip, and today's commute beside it.

LEARNED *the dress-code AI penalised what it could not see, so it now judges only what is visible.*

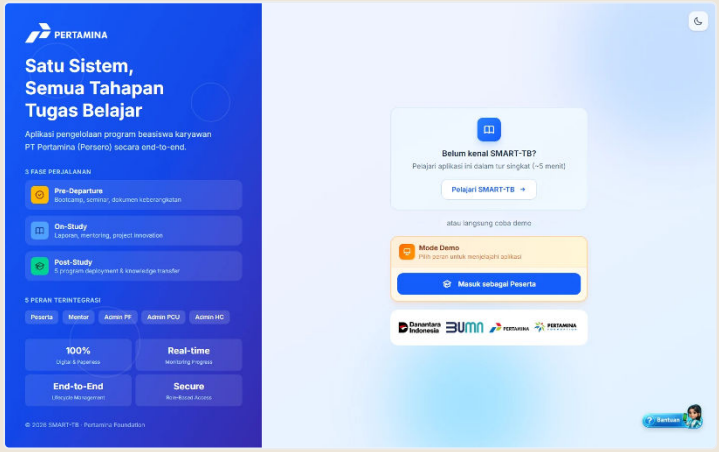
NEXT Some prototypes exist to settle requirements: clickable systems people walk through before anything is built.

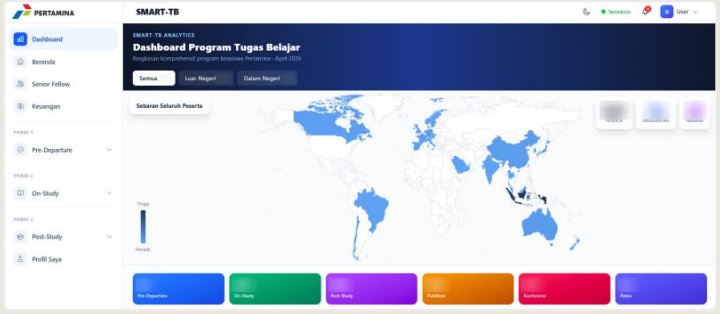
Clickable before it is built

Requirements written in a meeting mean something different to everyone in the room. A frontend that works on sample data settles them: people click through their own process, point at what is wrong, and the backend is built once.

SMART-TB · STUDY LEAVE, END TO END

One app from pre-departure through study to deployment back home, for scholars, mentors and three admin teams. A clickable prototype of dozens of pages, built from a recorded meeting's minutes.

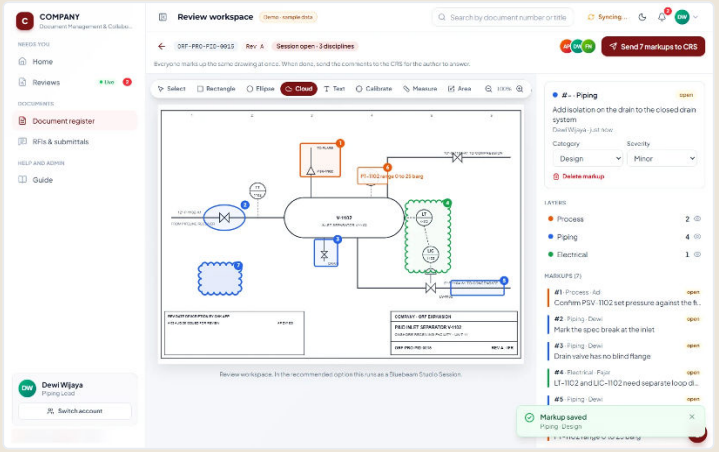


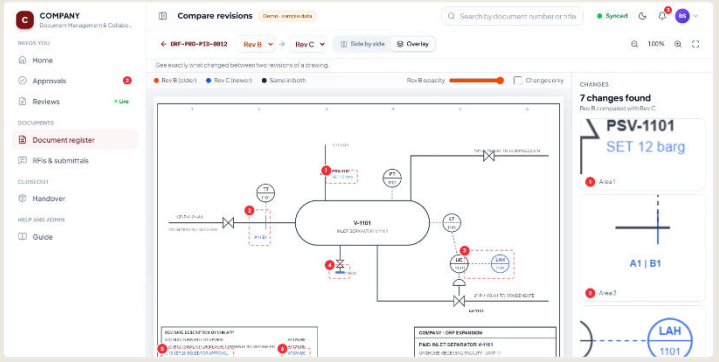


Sign-in by role, and destinations on a world map (figures blurred).

ENGINEERING DOCUMENTS · A PRESALES EXERCISE

A usable mockup of document control for an oil and gas project, made with the proposal: register, multi-discipline review, approvals and handover, every screen marked as sample data.





One drawing marked up by three disciplines at once, and two revisions compared.

The journey is the home screen

A study-leave scholar sees three phases as numbered cards, the current one running, the next ones waiting.

ANY PHONE

Five roles, one door

One login page shows the phases and roles before anyone signs in; a guided tour before first use.

PEOPLE DECIDE

Everyone marks up the same drawing

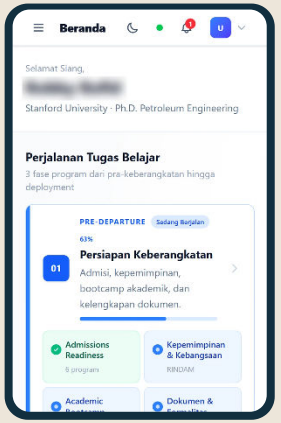
Reviewers from each discipline mark one drawing at once, numbered and coloured by layer, then send all markups to the comment sheet in one go.

PEOPLE DECIDE

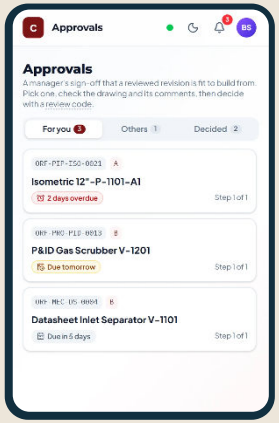
Revisions compared by eye

An overlay slider and a list of what changed between two revisions.

ON THE RECORD



The scholar's journey on a phone (name blurred)



Approvals on a phone, overdue first

LEARNED *check what company systems already cover, so the finance module was cut from the study-leave prototype before any build.*

NEXT Some systems have to work live, in front of a room, where nothing can go wrong.

Systems used in front of a room

WHAT IT IS Systems built for one live moment: a ceremony where officials sign on a tablet while the hall watches, a field app that handed school uniforms to a whole community in one day, and leadership's command room.

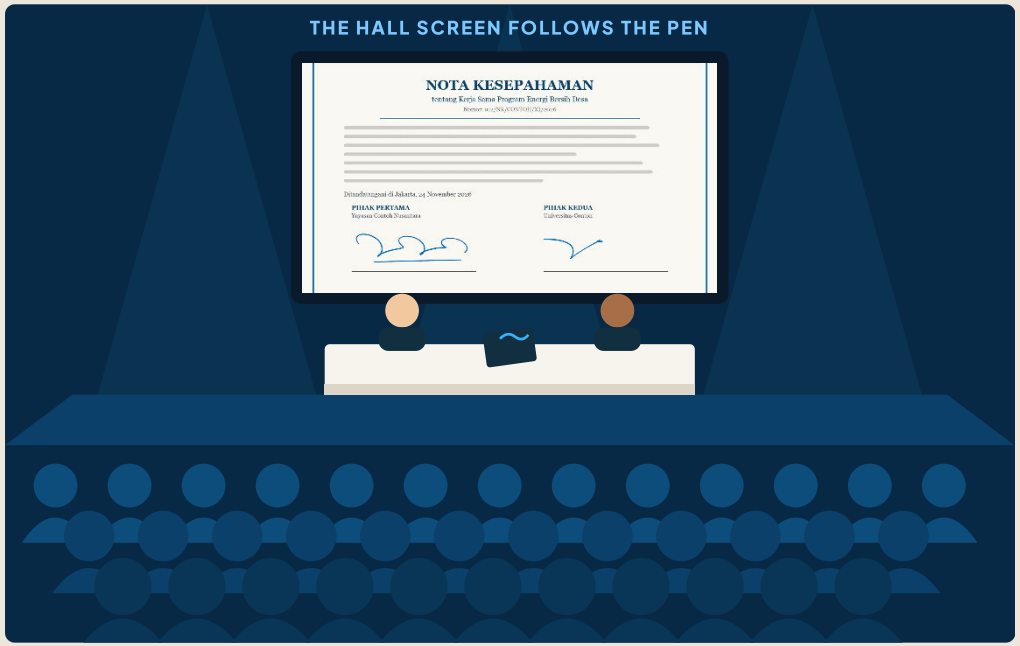
Discover.
Live moments forgive nothing: a signature wiped on a tablet in front of officials, a crowd of families in a field with no signal, a leadership room where switching screens stops the meeting.

Design.
Each built for one live moment: no login that can fail on stage, no network that has to cooperate, no setup anyone has to touch.

Deliver.
Ceremonies signed live, a field app verified on its full list of children, and a command room that runs itself.

ON STAGE Signing Ceremony

My own product, signing.muktiadi.com

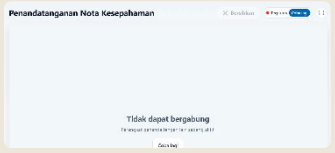




Set up in one screen



The pad: the signer writes



A second pad is refused

Officials sign while the hall watches
One tablet, one operator, any number of screens following the pen. Only strokes cross the network, so a screen that reconnects redraws the ink exactly.

An archive, not a screenshot
Every signature leaves as a vector PDF with the event's own layout.

ON THE RECORD

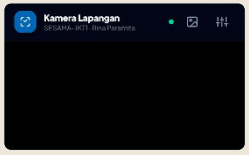
IN A FIELD SESAMA

School uniforms for a whole community, in one day





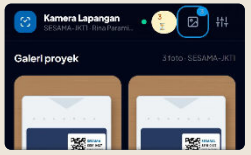
A slip scanned twice is caught



Each handover stamped



Queued, offline



Sent when signal returns

Every record on every device
The whole list lives on each phone with instant search, so a field with no signal changes nothing.

ANY SIGNAL

A numbered slip, then a photo
A slip printed over USB or Bluetooth, QR codes with no personal data, and a photo of each handover the server confirms.

LEARNED *hiding other signatures on a shared tablet is not enough, so each signer's screen receives only their own box.*

NEXT The third room is leadership's own: a command center fed by everyone's daily work.

A command room fed by everyone's daily work

Leadership wanted one room where the foundation's work is visible. The answer was not a monthly recap: numbers are recorded once in the apps where the work happens, flow into one copy without names, and fill two large screens.



The room, before



The concept I pitched: an AI render, every figure in it invented





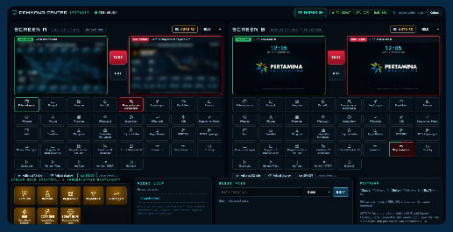
A programme on the wall (sample data)



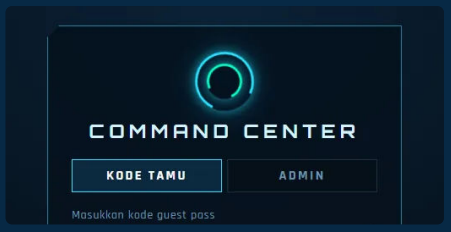
Each programme gets its page



Fire hotspots near planting sites



The control page behind the keypad



A guest pass for visitors



The room checks itself



Site cameras on the wall (mock)

Recorded once, where the work happens
Numbers are born in the work apps (selection, monitoring, forests, staff tasks) and flow into one copy with no names.
KEPT APART

Names never reach the room
Only totals cross into the room's copy; names and ID numbers stay in the source systems.
ON THE RECORD

IT out of sight
Support works over the private network on a separate screen that never shows on the TV.
KEPT APART

One number, one owner
Each indicator belongs to the programme person who records it; staff edit with their office account, by their seat in the programme tree.
ON THE RECORD

A room that runs itself
A hardware keypad on a driver I wrote; a presenter's laptop appears on the second screen by itself; a stuck window reopens on its own.
ANY CROWD

Where it started
A dashboard initiative in 2025 and a visitor kiosk with a province map came first; the room is what they grew into.
PEOPLE DECIDE

LEARNED *a wireless HDMI receiver always outputs a picture, so the room detects a presenter from the image, not the signal.*

NEXT Behind many of these moments is money: grants and advances that must be explainable afterwards.

Money that can be audited

WHAT IT IS The records behind the foundation's money: grant disbursement to partner campuses and staff cash advances, each change kept in a history nobody can rewrite, and every printed document verifiable by QR.

Discover.

Grant money flows to campuses and field teams, and every rupiah must be explainable later. Paper forms and spreadsheets cannot prove who changed what, or that a printed document is the real one.

Design.

The same two ideas matured across three systems in three months: a history nobody can rewrite, and a page anyone can use to check a document is real.

Deliver.

A disbursement record for the partner campuses that an auditor can follow, and documents anyone can verify by QR.



3 systems in three months, one idea

0 people who can approve their own request

1 QR on every printed page

∞ history kept: a change is a new line, never an edit

1 AUGUST 2026

Field monitoring, overnight

Sole author, one night

The three paper forms encoded as data; GPS and time stamped into each photo; a git-style history of every change; printouts with a QR.

2 SEPTEMBER 2026

Grant disbursement for the partner campuses

Analyst, architect and first builder; a colleague built most of the wider portal

Every change written with its audit entry in one atomic step; the browser never touches the database; each issued document verifiable by QR and fingerprint, with no names exposed.

3 OCTOBER 2026

Cash advances inside PFdrive

Architect and builder

Eleven stages, no self-approval, the official Excel layout read and written in the browser, and a QR on every printed report.

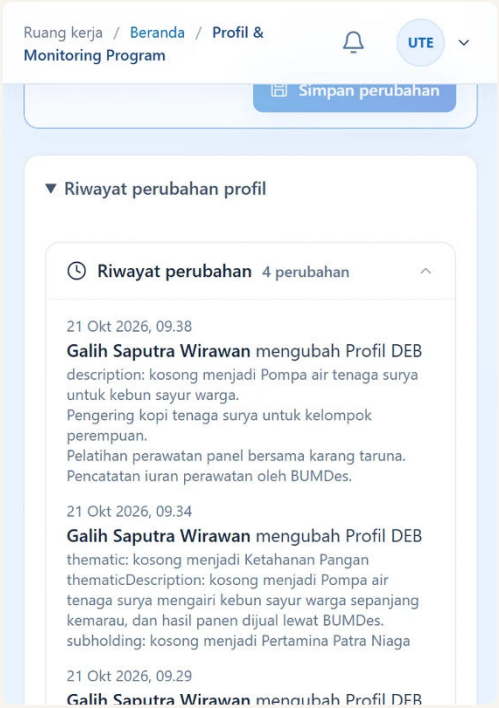
LEARNED *an audited record should never vanish, so deletes became a logged flag, and the public verify page honours it.*

NEXT The same two ideas, on the screens campuses and staff actually use.

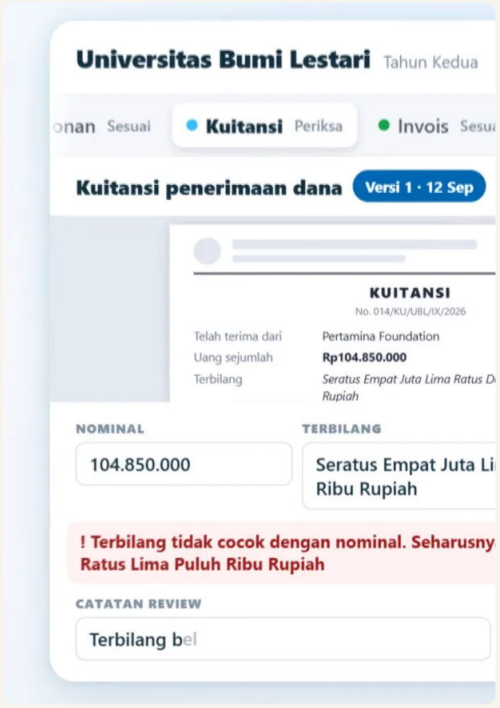
Every rupiah with its paper trail, on screen

The two ideas as the people using them see them: partner campuses reporting a grant, and staff taking a cash advance from budget to report. Example data throughout.

GRANT DISBURSEMENT TO PARTNER CAMPUSES

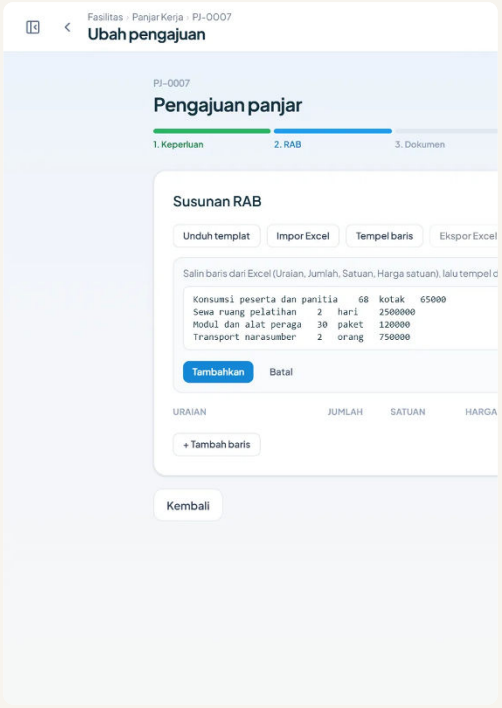


A history nobody rewrites
Every change kept, with who and when.



Words must match figures
An amount whose words disagree is refused.

CASH ADVANCES INSIDE PFDRIVE



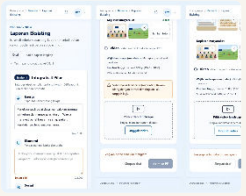
Paste from Excel
The budget arrives in the official layout.



Original, by QR
A phone confirms the paper matches the record.



Each campus signs in
One account per campus, checked on activation.



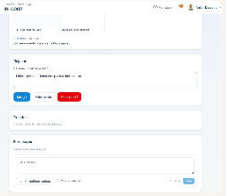
Reports in steps
Each stage reported with its documents.



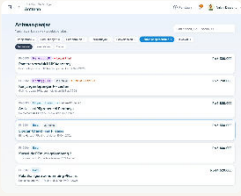
A QR on every page
Each page of each document can be checked.



Anyone can verify
The QR opens the record it was printed from.



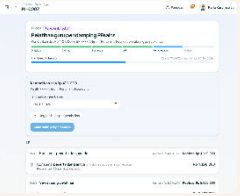
Reject with a reason
Two taps, and the reason travels with it.



Overdue always on top
The deadline clock starts at the transfer.



Spending with proof
Each line of spending carries its receipt.



The remainder returns
What was not spent is returned and recorded.

LEARNED *an amount is trusted only beside its source, so each campus review now opens on the decree's own line.*

NEXT Under all of these sits the estate that keeps them running: the infrastructure.

Underneath: the estate as built

WHAT IT IS The foundation's IT estate, run by one person: apps served from the edge, servers in Indonesia with a standby, an office server for developer desktops and code, a private network, monitoring and email.

Discover.
A small IT team had to keep public platforms up through national registration peaks, give developers managed machines and keep code inside the organisation, on a small budget and without exposing anything to the internet.

Design.
A hybrid estate a small team can run: the edge in front, cloud servers with a standby node, and an office server for desktops, code and files, all reached through one private network.

Deliver.
Every app watched, code kept inside the organisation, developer desktops managed, remote work with nothing exposed, and a written plan for the year after.



The edge in front
Every public app is a static build served close to its users, rebuilt automatically when code reaches a release branch; short links run on their own edge database.
ANY CROWD

Servers in Indonesia
Production databases on cloud servers in the country, so participants' data stays home; files and database backups in object storage.
KEPT APART

A standby twin
A second server on standby for production, which also hosts the private network's control and the uptime monitor.
ANY CROWD

An idle office server, put to work
Developer desktops cloned from one sealed image, a file share and a private Git server with CI, on networks that cannot see each other.
KEPT APART

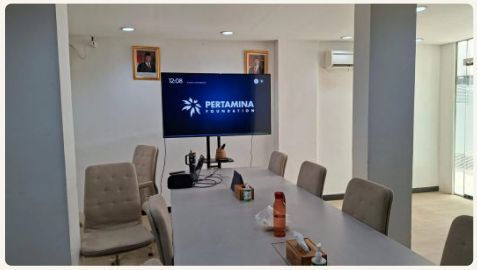
Code that only one door deploys
Everyone pushes to Git; the production branch is locked and needs a green pipeline.
ON THE RECORD

A private network, nothing exposed
A self-hosted zero trust overlay; every path allowed by policy, all-to-all switched off, interns reach only their own desktop.
KEPT APART

Watched around the clock
Every app's uptime is monitored against a monthly target, and the command room's screens heal themselves.
ON THE RECORD

Email chosen on data, not habit
The delivery provider was picked after comparing five on data residency, price at volume and overage.
ON THE RECORD

Certificates that cannot be abused
An internal authority constrained so it can only sign internal names.
ON THE RECORD



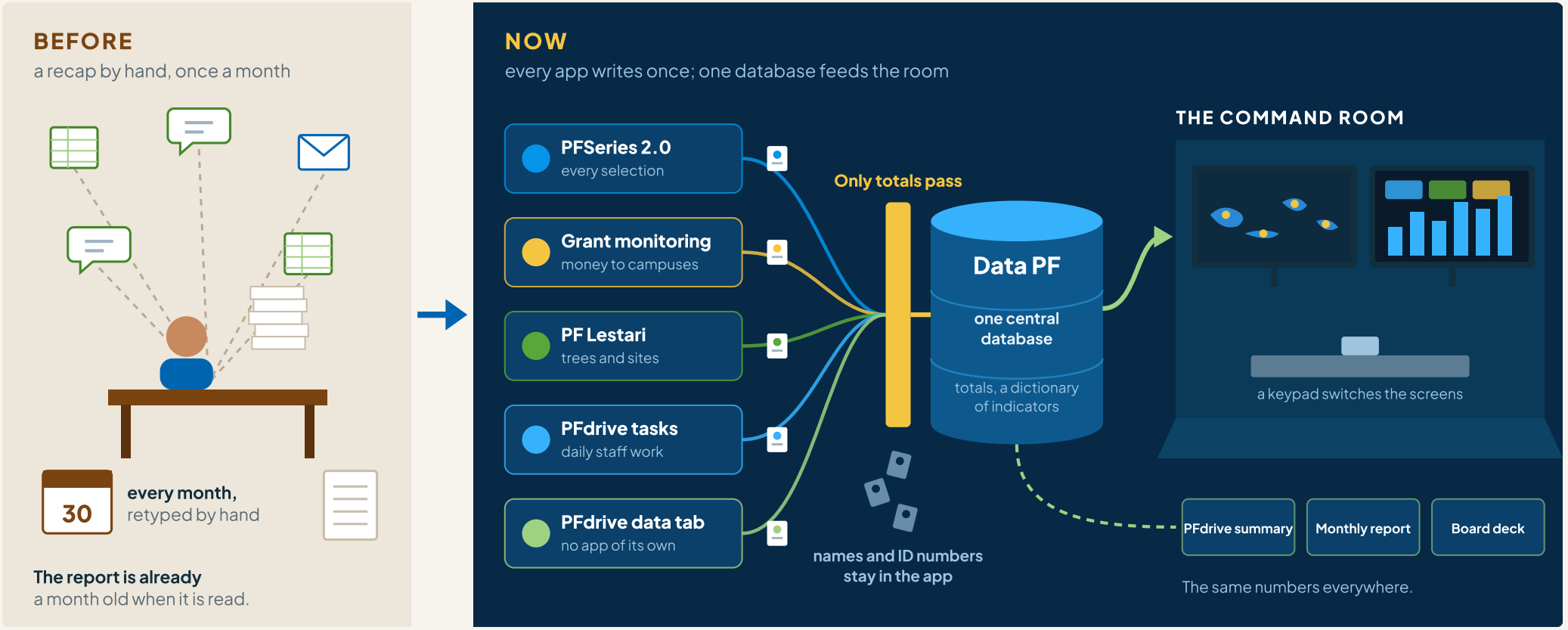
A meeting room TV that shows its own agenda from the office calendar and recovers by itself: one of the small automations on this estate.

LEARNED *cloud credit can run out before the year does, so every server is now traced to a programme and forecast.*

NEXT On top of the estate runs the data: every app writes once, and one database feeds the command room.

Every app writes once; one database feeds the room

Each app sends its totals into one central database, which fills the command room's two screens, the PFdrive summary, the monthly report and board material.



Record once, where the work happens
Programme staff enter a number in the app they already work in; nobody keeps a second spreadsheet for the recap.
KEPT APART

A dictionary and checks on entry
Every indicator is defined once, and a value that breaks its rule is caught when it is entered, not when a director reads it.
ON THE RECORD

One number, one owner
Each indicator belongs to the programme person who records it, and edit rights follow their seat in the PFdrive programme tree.
ON THE RECORD

A tab for programmes without an app
Programmes that have no system of their own report through a data tab in PFdrive, into the same database.
ANY PHONE

Totals only, past the gate
Names and national ID numbers stay in the source apps; only aggregates reach the central database and the room.
ON THE RECORD

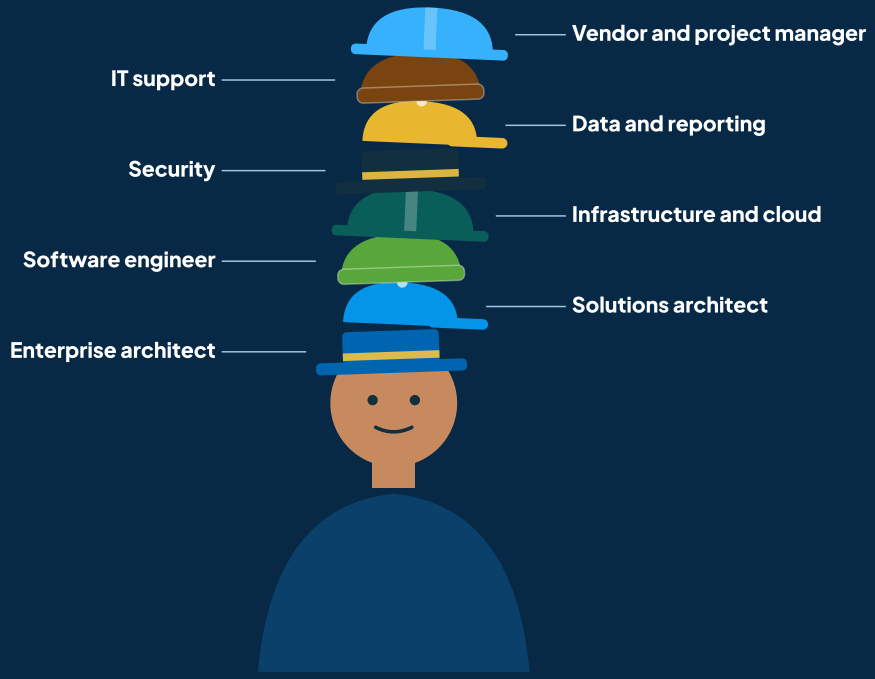
Every change kept
Each edit to a number keeps its history, so the room can always say where a figure came from.
ON THE RECORD

Eight hats on one head, and the plan that hardens it

The group's IT guideline assumes eight separate functions. At the foundation, I hold all eight. So the design has to make one person safe: machines that judge, keys nobody carries, access that follows the job.

8
IT functions the group's guideline assumes

1
person holding them at the foundation



PROPOSED FOR 2027

PILOT RUNNING SINCE OCT 2026: THE IT TEAM ALREADY WORKS THIS WAY

The directors were not asked to approve technology. They were asked for four decisions with milestones, framed as three outcomes: spend less, comply with the data protection rules before they take effect, and see who does what with which data.

Access follows the job
One account per person; every connection checked for identity, device and role. A leaver loses every door within a day; interns and vendors get access that ends on a date.
ON THE RECORD

Participants feel nothing
Applicants and judges keep the same public apps; only the staff side moves behind the gateway.
ANY PHONE

Machines judge
Four rooms and three gates from laptop to production; a failed pipeline stops by itself, and a critical finding cannot go live whoever asks.
ON THE RECORD

AI agents pass the same gates
Interns, developers and AI agents never hold production keys or real data; whoever writes a change never approves it.
PEOPLE DECIDE

Keys nobody carries
Secrets move to a vault and only the deploy machine holds production keys, so a lost laptop takes no access with it.
KEPT APART

Build or buy, written down
Self-hosted first, with written triggers that move to a paid service without redoing identity and policy work.
PEOPLE DECIDE

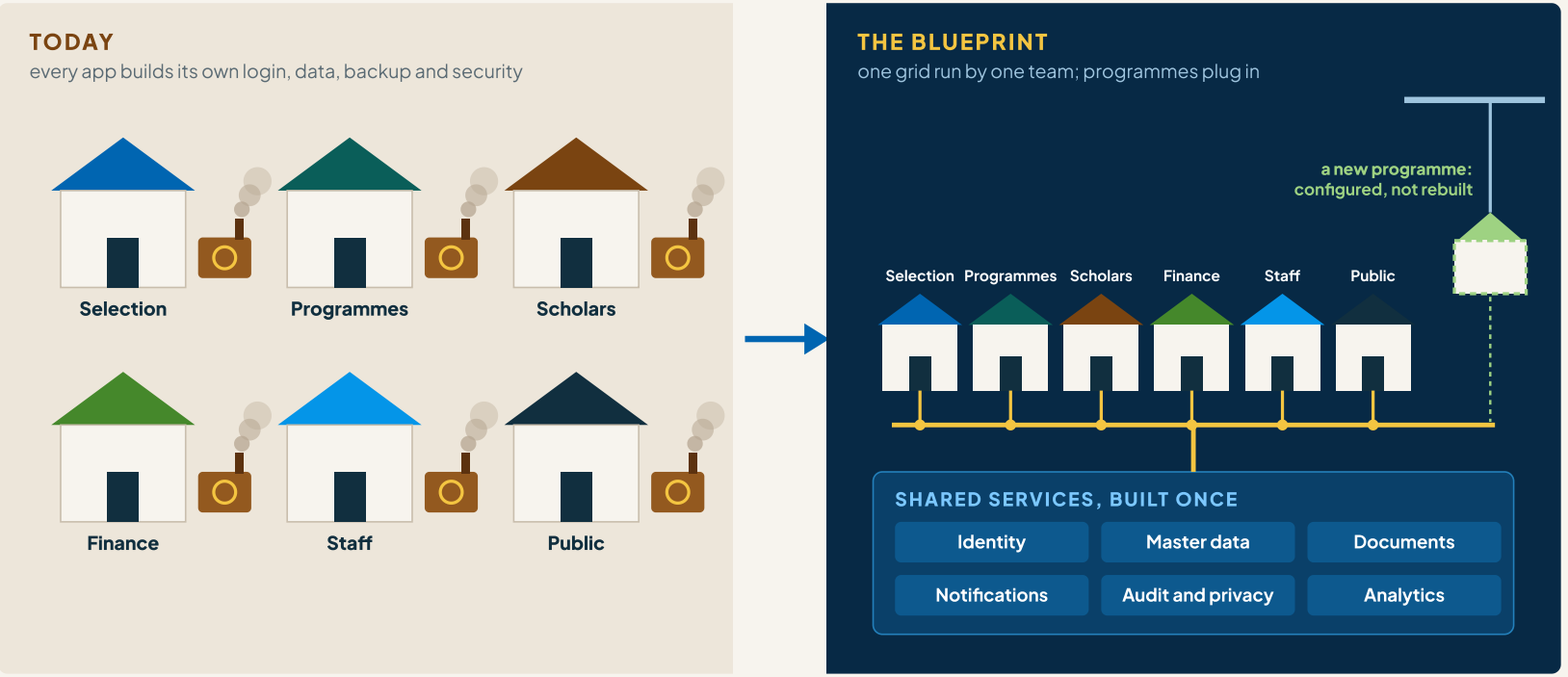
Drawn first for the directors, to explain why the plan leans on automation rather than headcount.

LEARNED *system and security changes need a human hand, so they ship as reviewed scripts I run, each refusing unsafe reruns.*

NEXT An architect's other output is paper: the blueprint that lets others build, buy and audit.

The blueprint: one grid instead of a generator in every house

Today every app builds its own login, data, backup and security, like a generator in every house. The enterprise architecture blueprint I drew for the foundation proposes one grid run by one team: programmes plug in, and a new programme is a configuration job, not a new vendor.



EIGHT PRINCIPLES

1 Platform first
2 One identity
3 One source of truth
4 Privacy by design
5 Secure by default
6 Open standards
7 Resilient
8 Data in Indonesia

A MIGRATION IN FOUR STAGES, EACH DELIVERING ON ITS OWN

1 **Foundation** — identity, gateway, shared services
2 **Core and pilot** — one programme moves first
3 **Migration waves** — the rest, domain by domain
4 **Optimisation** — retire the old generators

Capabilities stay, applications change

Six business domains stand on six shared services: identity, master data, documents, notifications, audit and privacy, analytics.

KEPT APART

One door, one account

One account with multi-factor sign-in, a gateway that checks rights, then counters for applicants, staff, the public and leadership.

ON THE RECORD

One owner per piece of data

Every data entity has one source and one owner; reports read a masked copy so they never slow the apps.

KEPT APART

Data protection built once

Nine layers under every feature, from consent per purpose to parental consent and retention, inherited by every app instead of rebuilt.

ON THE RECORD

LEARNED *programme rules hard-coded in the old portal turned every new programme into code, so the blueprint makes programmes configuration.*

NEXT Blueprints are only useful written down: documents that let someone else procure, audit or run the system.

Written so others can build it

WHAT IT IS The documents that let others build, buy and audit: a tender package with traceable requirements, process models of every programme, a controlled documentation set, and an honest review of my own work.

Discover.

A system that lives in one person's head cannot be procured, audited or handed over. The organisation needed documents a vendor could price, an auditor could check and a successor could run.

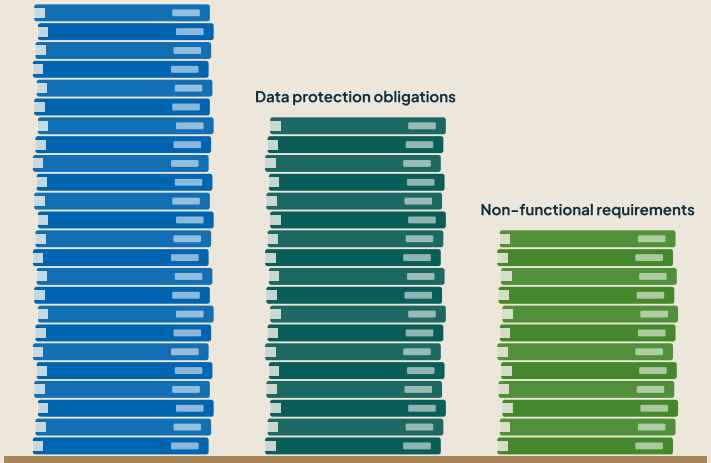
Design.

Documents written for the people who come next: a vendor pricing a rebuild, an auditor checking compliance, a successor running the system without me.

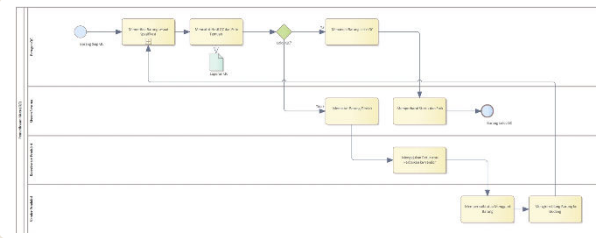
Deliver.

A tender package a vendor can price, with hundreds of traceable requirements and data protection designed in.

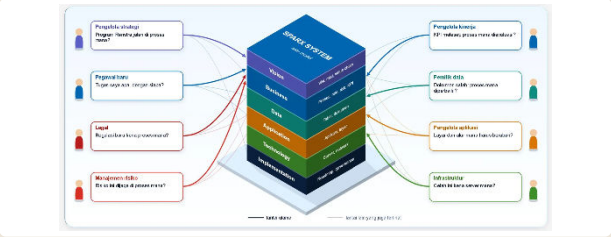
WHAT THE TENDER PACKAGE SPECIFIES, IN PROPORTION



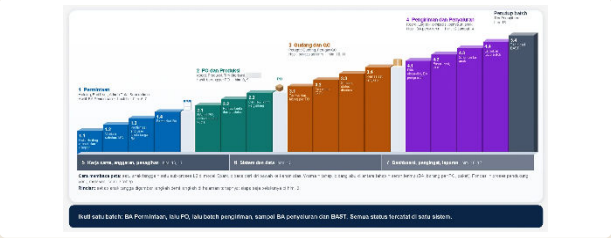
Stacks in proportion: every requirement written so a vendor can be held to it



A process diagram generated from a spec: quality control, with its reject and resend loop.



One model, six floors, every role asking the same picture: the knowledge transfer deck.



A logistics batch read as a staircase of four stages, prepared for a system integration meeting.

A tender package for PFSeries 2.0
Charter, requirements, reference architecture, RFP, pricing method, acceptance tests, and an exit plan that makes the vendor prove a restore.
ON THE RECORD

Process maps from the people who do the work
Every programme walked through step by step in workshops, drawn as process models, validated with the owner, kept up to date.
PEOPLE DECIDE

A controlled documentation set
A numbered set of technical, manual, decision and guide documents, published as PDFs.
ON THE RECORD

A quality review of my own work
Dozens of findings with line-level evidence, stated plainly as a self-assessment, not an independent one.
ON THE RECORD

Training passed on
After a systems analysis course, a knowledge transfer deck for the team: one model, six floors, from procedure to audit. The only deck reviewed five times.
PEOPLE DECIDE

A presales exercise
A document management proposal with three priced options and a clickable prototype with end-to-end tests.
PEOPLE DECIDE

A vendor can price it, an auditor can check it, and a successor can run it without me.

LEARNED *a rebuild can discard what the field proved, so the tender makes the vendor keep traits like account-free judge seats.*

NEXT One more part of the foundation's work happens outdoors: in planting sites, with drones and tags.

PF Lestari and the field

WHAT IT IS PF Lestari is the foundation's reforestation programme. I built its field tools: an ID and a QR bracelet for every tree, an offline field camera, and drone LiDAR surveys of the planting sites.

Discover.

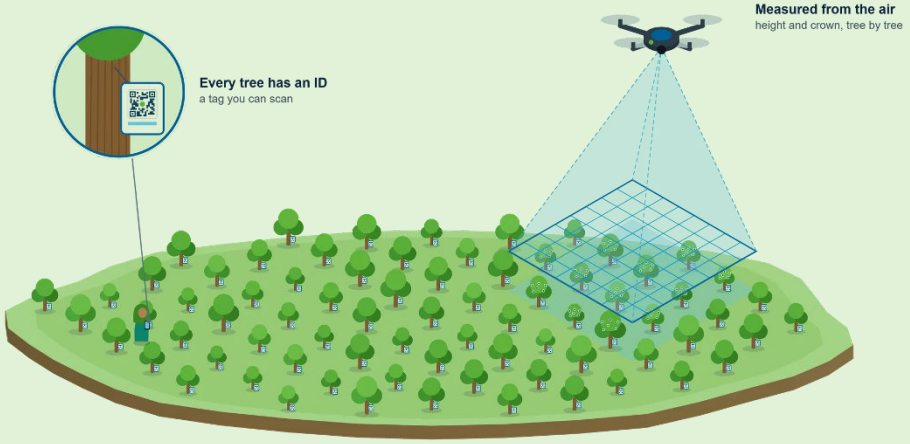
A planted tree is only worth reporting if it can be found and checked again. Field photos lose their location by the time they reach the office, and a tree without a durable ID cannot be verified.

Design.

Field tools for the foundation's reforestation programme: an identity for every tree, a camera that works without signal, and planting sites surveyed from the air.

Deliver.

Gold, then Platinum at the Annual Pertamina Quality Award 2026 for the programme, and every tree given an ID it can be found by.



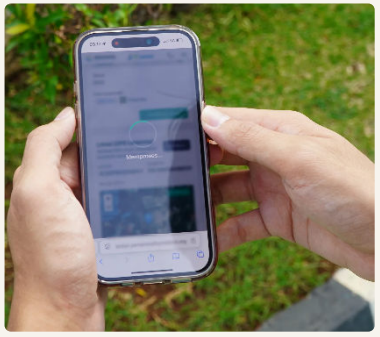

With the LiDAR drone that surveys each planting site.



Bands printed by the thousand



One band, one tree, for life


Saved on the phone, signal or not


The site, seen from above

An ID for every tree
IDs with two check characters that catch a wrong digit, printed as QR bracelets that open the tree's page, many thousands per run.
ON THE RECORD

A field camera that waits
An offline camera that waits for a good GPS fix, tags the tree by QR, and exports a day's work as one file.
ANY SIGNAL

Sites seen in 3D
Drone LiDAR surveys of the planting sites, viewable in 3D in a browser.
ANY PHONE

Safety gear, checked in the browser
A detection model I trained runs on the device: no GPU server, no footage leaving it. A proof of concept; its accuracy is still modest.
ANY PHONE

LEARNED *a geotagged photo is useless unless tied to its tree, so the field camera now scans the tree's bracelet QR.*

NEXT The band itself, redesigned: one cut, two trees.

One cut, two trees: a band that locks itself

The first band worked but wasted material: glued stickers and two tails per band. The new one is cut from one strip, two bands nested head to tail, and the tail threads through three slots to lock itself, so it holds in rain and sun and loosens as the tree grows.



~70%
less material per band than v1

2
bands from every strip of the roll

0
glue, and no offcut left on the site

Designed to be manufactured

Die cut on a roll, no sharp corners, no offcuts: every cut point audited and rounded.

ON THE RECORD

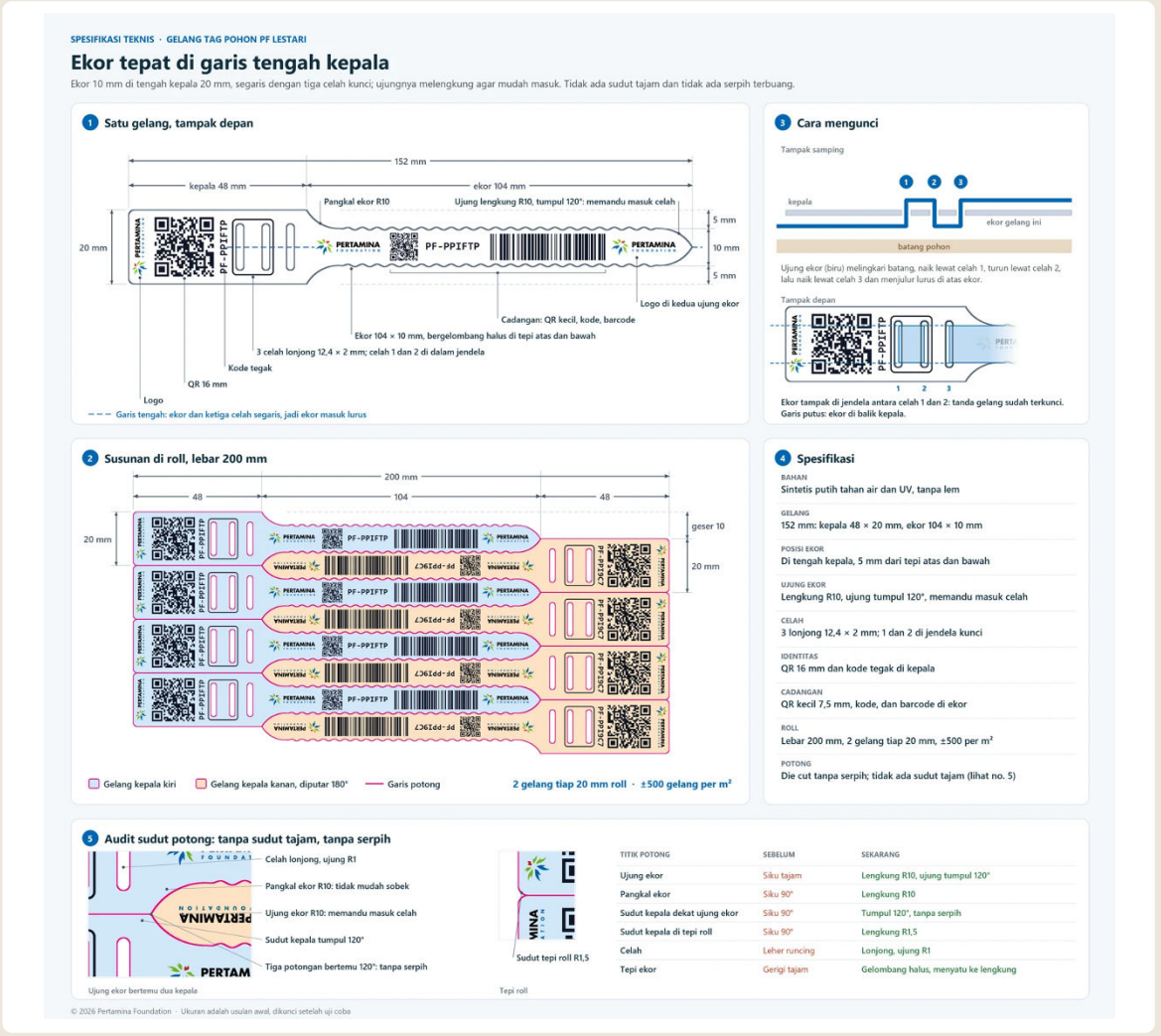
Still readable when damaged

A big QR on the head and a small QR, code and barcode on the tail as a backup.

ANY SIGNAL



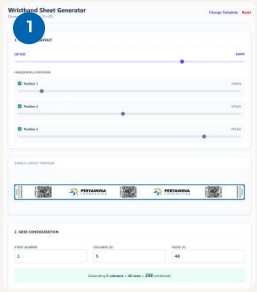
How it will be used: plant, wrap, thread through the slots, scan, monitor (visualisation).



The specification I drew for the printer: dimensions, two bands per strip on the roll, how the tail locks, and every cut corner audited.

From a printed band to a tree on the map, then Gold and Platinum

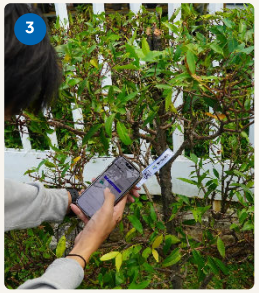
A TREE'S FIRST MINUTE, IN FIVE STEPS



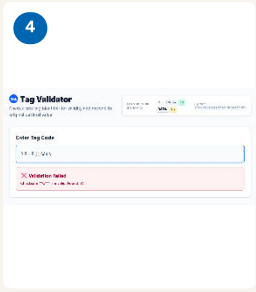
Generate a sheet of IDs



Band the tree



Scan the band

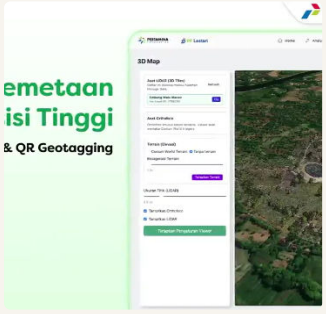


A mistyped ID is caught



The tree, on the map

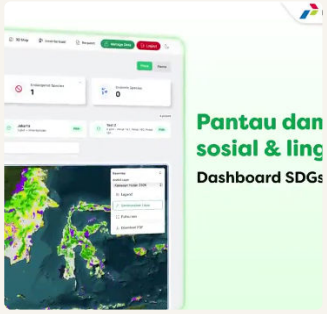
THEN EVERY VISIT, FROM THE AIR AND ON THE MAP



Geotagged on the survey



Growth checked visit by visit



Every site on one map



Sites as LiDAR point clouds



Ready to fly among the young trees



A hillside planting site from the air

100k tree IDs in one print run

2 check characters per ID

0 bars of signal needed

RECOGNITION

Gold, then six months later, Platinum.



Gold

Forum Sharing CIP Holding, 2025



Platinum

Annual Pertamina Quality Award, 2026

six months

2025 · Gold — **June 2026 · Platinum**

Both awards went to the PF Lestari team for its continuous improvement project. I built its field tools and flew the surveys.

LEARNED *tags get misread and mistyped in the field, so tree IDs leave out confusable letters and carry check characters.*

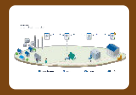
NEXT That closes Part 2. None of these habits began at the foundation; Part 3 goes back to where they were learned.

PART 3

Before the foundation

Where the habits came from

None of the habits in Parts 1 and 2 started there. They were learned in a refinery crisis, in HR analytics across refineries, in a semester of engineering in Europe, in control systems for machines, and in a lab teaching student teams to build.

49 
Refinery crisis response
Fast compensation that must survive an audit

51 
Pertamina HC
Reports, plans and permits rebuilt by hand

52 
Where it started
Machines and sites that cannot go down

53 
A semester in Europe
Engineering, in another country

55 
The living lab
Student projects finished, shown and written down

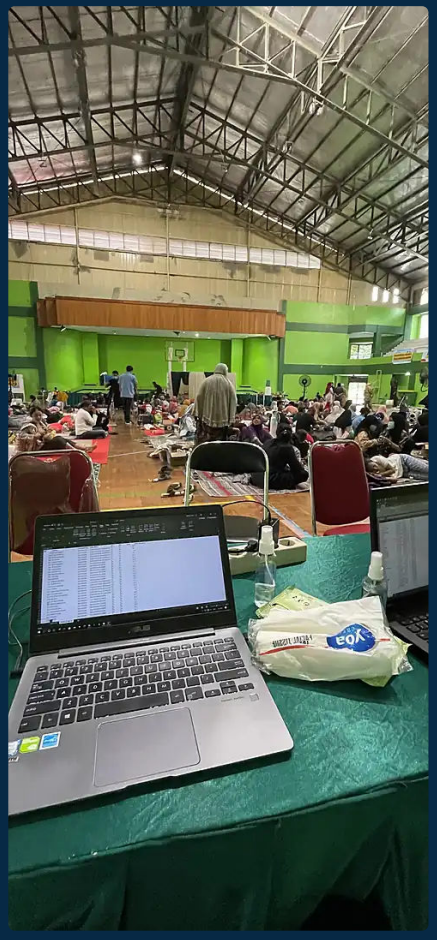


MARCH 2021, BALONGAN

The refinery caught fire. I showed up with a laptop.

Black smoke over the company housing, seen from my own street. The shelter for every evacuated family was inside the complex where I lived.

Two weeks after my internship ended, a fuel tank at Refinery Unit VI caught fire. Late that afternoon my manager called: come to the shelter, bring whatever you have. Hundreds of families sat on mats with whatever they had carried out, and nobody could plan food, mattresses or medicine without a list. **So I opened a registration post on a folding table.**



The registration post at the shelter: three hours of names, households and typing.



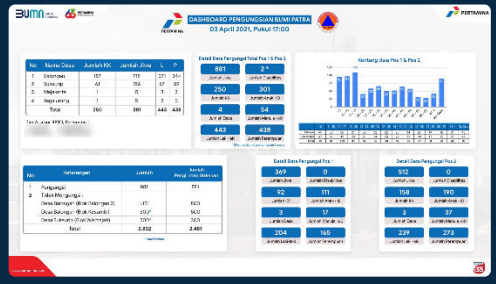
The command post for the social and environmental response, where the compensation work began.



Pertamina's President Director at the evacuation site.



Refinery management reviewing the live recap.



3 April 2021: the shelter count, 881 people in 250 households.

THE FIRST NIGHT
Families registered by hand; the count went out on national TV and set the aid.

THE NEXT WEEKS
Brought into the response team for the compensation data.

ABOUT A MONTH
One platform live: surveyors, appraisers, the bank and the back office on one record.

TWO YEARS
Every payment claimed back from the insurer; the force majeure closed.

YEARS LATER
Audited by BPK, the state audit board. It passed, without me in the room.

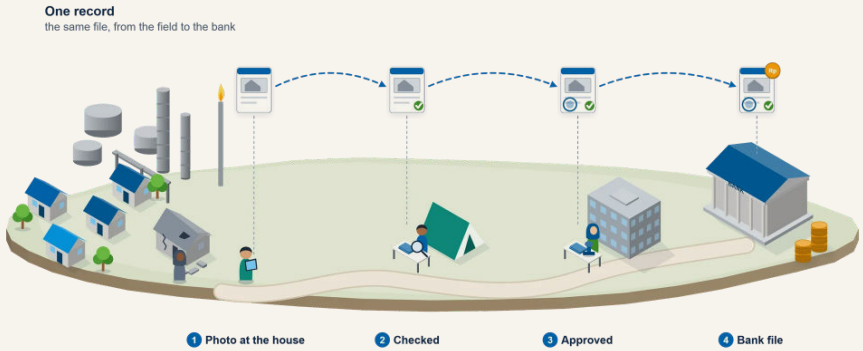
Balongan: from field photo to bank file

WHAT IT IS After the 2021 fire at Pertamina's Balongan refinery, damaged houses in the surrounding villages had to be assessed and compensated. I led the data, system and infrastructure for the platform that took each house from a field photo to a bank file.

Discover.
After the refinery fire, damaged houses across the surrounding villages had to be assessed and compensated quickly, with every payment defensible to auditors later. A spreadsheet per team, typed documents and hand-made bank lists could not survive that.

Design.
One platform for the whole compensation chain, plus the field network and print servers it ran on. Data, system and infrastructure lead on a one-year contract.

Deliver.
Live in about a month. The records passed the insurance claim audit and, years later, the state audit by BPK.




Handover day: each resident matched to their record at a numbered desk; the documents printed themselves.


The field team for the compensation, house by house



Part of the core response team: field verifiers, finance, HC and CSR

ONE HOUSE'S RECORD, FROM THE FIELD TO THE AUDIT

Field photo	Assessed	Computed	Documents	Bank file	Audit
and description, per house	PUPR building, Pegadaian value	compensation, per owner	berita acara, kuitansi	approved records only	insurance, then BPK

THE ROOM

Eight parties had to trust one record.

Pertamina management · BNPB · PUPR · Pegadaian · Finance · Partner banks · Corporate ICT · Field team

~1 month
from the first meeting to a live platform

BPK
the state audit, years later, after the insurer's: passed

One record per house
3,323 buildings surveyed by 16 teams in seven field days, each with its photos, the building assessment and the property valuation on one record.
ON THE RECORD

Money computed, never typed
Every item and the building estimate summed per house, the total spelled out in words, and the handover letter and receipt printed for a whole village at once.
ON THE RECORD

Payment lists from approved records only
Exported only from records that passed every stage, so the payment list and the platform could never disagree. The insurer later got its own read-only view.
ON THE RECORD

A live view nobody needs training for
Progress and money out aggregated live, beside a shelter dashboard in Power BI read without training.
ANY PHONE

Records are judged years later, by people who were not there. The system has to answer for itself.

LEARNED *records are judged years later by auditors who never ask, so I capture evidence with the record, never afterwards.*

NEXT Before the crisis, the same instinct had already changed how Pertamina's refineries report on their people.

Human capital, across refineries

WHAT IT IS Tools built inside Pertamina's human capital function: monthly HC reporting adopted across every refinery, Ampera for planning employee transfers, and Covid Ranger, a WhatsApp chatbot for residents' exit permits.

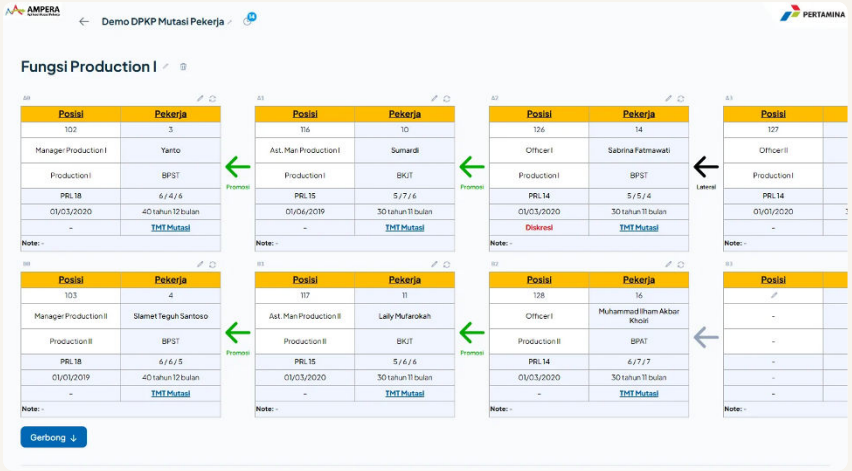
Discover.
Monthly HC reports were rebuilt by hand at each refinery with no comparable view for executives, transfer planning meant half a day rebuilding boxes in PowerPoint, and residents needed exit permits that guards could check.

Design.
Tools built inside the HC function, on what people already used: Power BI, their own Excel files, WhatsApp.

Deliver.
HC reporting adopted across every Pertamina refinery, a four-hour meeting cut to 47 minutes, and thousands of residents served by chat.

A four-hour transfer meeting became 47 minutes, and the HC dashboard was launched by the VP of Human Capital.

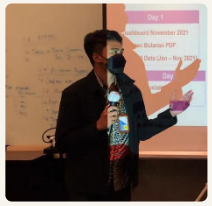
47'



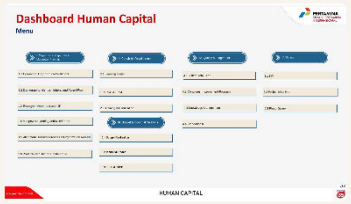
Ampera, rebuilt as a demo on my site: positions as trains of cards, moves as arrows. Sample data.



At the keyboard, the team watching



Presenting day one



2022: one menu for all of HC

HC reporting, every refinery · 2020
Power BI, the tool management already opened, with KPIs refined together with the HC team. Copied at a second refinery, then adopted at all of them, and launched by the VP of Human Capital.

PEOPLE DECIDE

Ampera, the transfer planner · 2020 to 2021
One page that reads the team's own Excel files and writes the plan back. Nothing to install; personnel data stays on the laptop.

ANY PHONE

Covid Ranger · 2021
A WhatsApp chatbot, because every resident already had WhatsApp: a supervisor approves in the chat, the guard scans a QR. Thousands of residents, hundreds of conversations a day.

ANY PHONE

Learning and knowledge, group-wide · 2024 to 2025
Process analysis for one integrated learning and knowledge platform, a revamped HC corporate dashboard, and the rollout videos.

KEPT APART

DECEMBER 2021 · KPI HEAD OFFICE

The dashboard handed over in a two-day workshop with the VP of Human Capital.
Day one: the November dashboard, the monthly PDF report and the year's data. By 2022 it was the company-wide version, one menu for all of HC.

COVID RANGER, 2021

An exit permit in the app every resident already had.



Approved by a supervisor in the chat



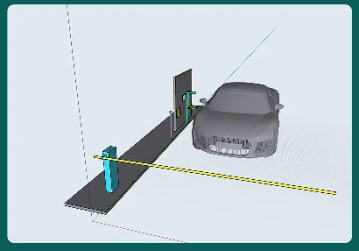
Not approved: the guard sees it at a scan



Invalid: a code the system never issued



In use, blurred

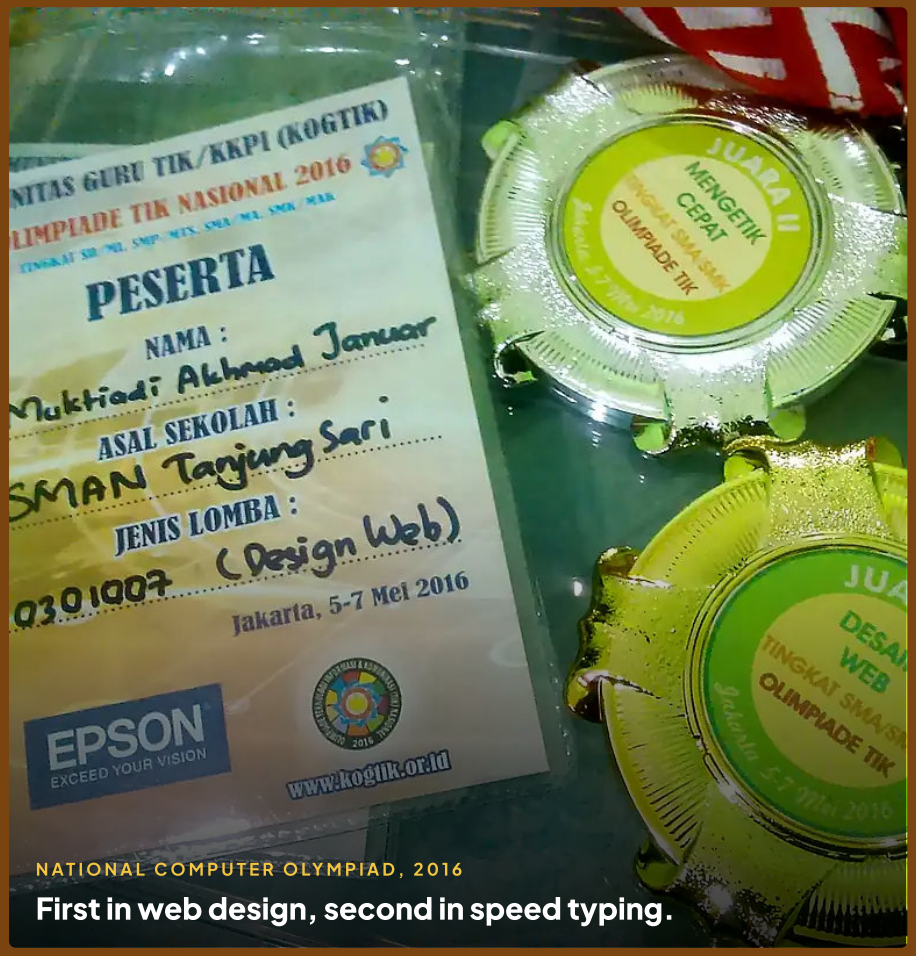


The plan for a self-service gate

Scan to play all three roles, rebuilt from the original code.

Where it started

WHAT IT IS Before software platforms: a first national medal at sixteen, a semester of mechanical engineering in Hungary, years as a university's sole web administrator, and instrumentation and control for a bioenergy machine.



NATIONAL COMPUTER OLYMPIAD, 2016

First in web design, second in speed typing.

CHILDHOOD

How does it work?

A metal box with a round button, taken apart. The question every chapter of this book still asks.

2016, AGE 16

Two medals, one plan with three fallbacks

Found the National Computer Olympiad two days before registration closed, slept on a university lab floor, came home with first place in web design and second in speed typing.

2018, HUNGARY

A semester of mechanical engineering abroad

Computer science at Itenas (GPA 3.87) with an exchange semester in Hungary; seven of us represented Indonesia at the university's Researchers' Night.



The 2016 olympiad poster, found two days before registration closed.



How does it work? Still the first question.



The medal ceremony in Jakarta



The web design round

THEN THE ENGINEERING WORK

University web systems · 2016 to 2019

Sole administrator of a university's web systems and its new student admission application, with continuous uptime for the whole contract.

ANY CROWD

Bio CNG control · Itenas, 2024 to 2025

Led the instrumentation and control system: an embedded architecture for real-time control, monitoring and safety, in a Rp2.8 billion LPDP-funded project.

ON THE RECORD

LEARNED *the first medal came from a plan with three fallbacks; every launch since has had one.*

NEXT Then a semester in Europe: mechanical engineering in Hungary, and Indonesia's booth at Researchers Night.

PART 3 · FALL SEMESTER 2018/2019 · ERASMUS+

A semester in Europe

In the fall semester of 2018/2019 I was one of four Itenas students on an Erasmus+ credit transfer at Szent István University in Gödöllő, Hungary: a computer science student placed in the Faculty of Mechanical Engineering, taking CAD, electronics, quality management, informatics, and Open Lab, where a supply chain problem became an IoT solution proposal.



Four Itenas students with the exchange banner in front of the Hungarian Parliament, Budapest.

The semester on video
My playlist from the exchange in Hungary, 2018/2019, opening on the testimony.



Szent István University, Gödöllő: now the Hungarian University of Agriculture and Life Sciences.

A COMPUTER SCIENCE STUDENT, IN A MECHANICAL ENGINEERING FACULTY

Open Lab
Supply chain IoT: a business problem turned into a solution proposal

CAD

Electronics

Quality management

Informatics

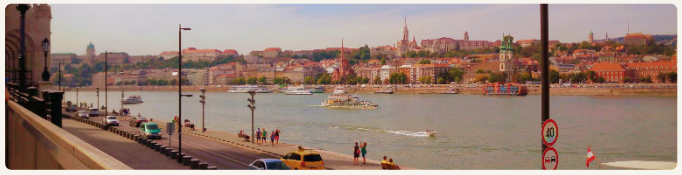
Where the workshop and the control systems in this book began.



Welcomed by the university, the first week.



A courtesy call at the Indonesian embassy in Budapest, with the Indonesian student association in Hungary.



The Danube from Parliament



My first snow



The windmills at Zaanse Schans

LEARNED *the courses outside my field stayed with me longest, which is why CAD, electronics and control sit beside the software in this book.*

NEXT And one evening that taught more than a course: Researchers Night, and the Indonesian booth.

Seven of us, one booth, and the headwear everyone wanted

Every year the university's Researchers Night ends in a Global Village: a booth for every country in the Rector Hall, local families walking round with their children. On 28 September 2018 seven of us represented Indonesia: perkedel, bala-bala, rendang and wedang jahe cooked in a tiny Hungarian kitchen, and a stack of Javanese totopong we thought were decoration.



Every booth in one photograph at the end of the night, most still wearing pieces of each other's clothing.



The Indonesian booth: the flag, the food, Wonderful Indonesia on a loop



In batik and totopong, the flag on my shoulders



The delegation, before the hall opened

> **"Cultural exchange actually works. Not through presentations or pamphlets, but through letting someone wear a piece of your tradition and seeing their face light up."**
>
> FROM MY BLOG, ON THAT NIGHT

Students from every booth lined up to try the totopong. We spent half the night teaching people to fold and tie them; one student wore one over his keffiyeh until the end. The exchange went both ways: one of us came home in a Turkish fez.



Students from a dozen countries



A lounge that became a common room



The international cohort, outdoors



Classmates, the last weeks

The living lab: teaching teams to build

WHAT IT IS At Itenas' Innovative Workingspace Integrated Living Laboratory (I-WILL), I advised student teams on IoT and engineering projects, led the drone-as-a-wingman integration for the Sergap-Senyap electric military vehicle, and ran the lab's first workshop.

Discover.
A lab full of student teams and hardware, and a drone integration due at a national defence expo: projects had to be finished, shown and written down, not only demonstrated once.

Design.
Advice at the bench, a workshop on finishing and documenting a project, and a drone that flies as a wingman to an electric vehicle.

Deliver.
The Drone-as-a-Wingman system prepared for the Indo Defence 2024 Expo and Forum, and the lab's first workshop on 13 September 2024.



The lab's first workshop, which I gave: creating a great project, and documenting it well. 13 September 2024.


A team at work in the lab.


Presenting the drone as a wingman and surveillance system.


The drone team presenting, their drone hovering over the room.


A drone frame being wired on the lab bench.


Visitors at a lab showcase, trying the builds


A crowd round the students' robot


Explaining a build with a student team

A drone as a wingman
Led the drone integration for the Sergap-Senyap electric military vehicle: a drone that flies as an add-on to it, prepared for the Indo Defence 2024 Expo and Forum.

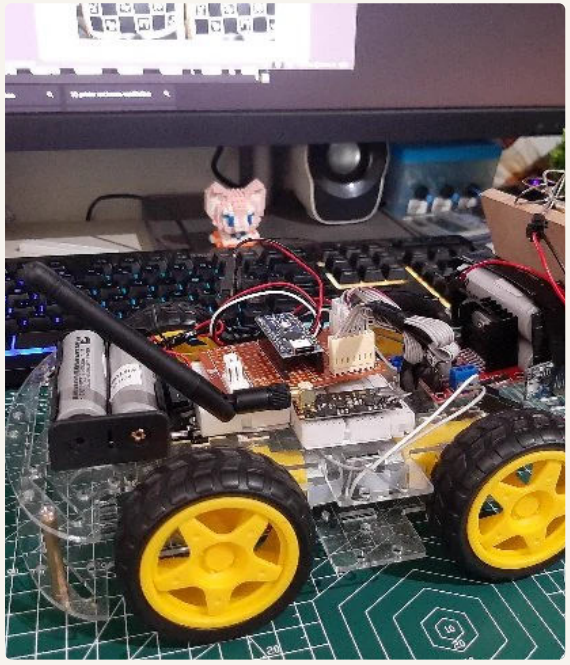
The lab's first workshop
Creating a great project, and documenting it well: how to scope a build, finish it and write it down so the next team can carry it on.

LEARNED *a project the next team cannot rebuild is only half done, so the lab's first workshop was about documenting the work, not only making it.*

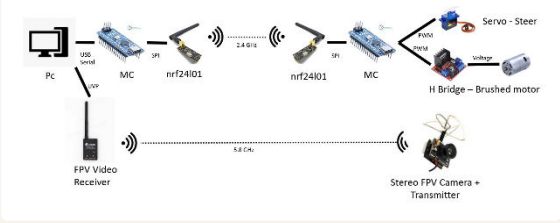
NEXT Then the same lab as a test room: a car that maps it with one cheap camera.

A room mapped by one cheap camera

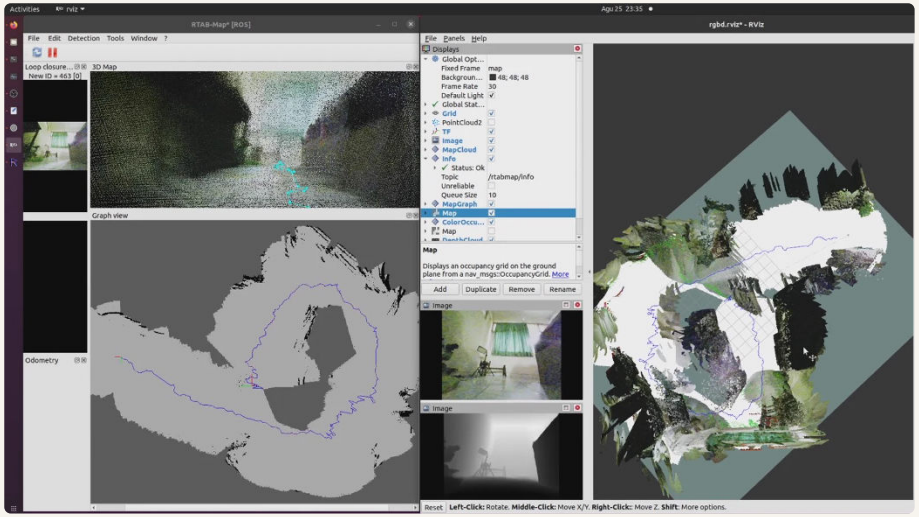
Mapping a room usually takes a stereo camera or a LiDAR. I wanted to know whether a single wireless FPV camera could do it if an AI model guessed the depth of every frame. So I built a car I could drive from a PC, put the camera on it, and fed each frame through Depth Anything V2 into RTAB-Map, a mapping algorithm, in the lab's workshop room.



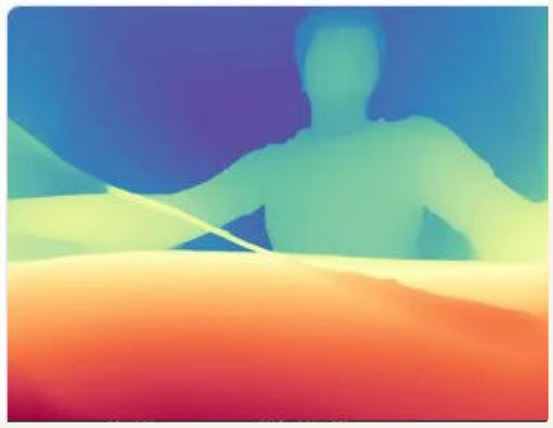
The test car: an acrylic 4WD chassis, a microcontroller at each end of a 2.4 GHz radio link, a 5.8 GHz FPV camera on a cardboard mount.



Commands go out by radio; the camera's video comes back on its own channel.



What the car built while driving: the camera views, a floor map with its path, and the room as a 3D point cloud.



Depth guessed from one picture: near is warm, far is cool.



The test room, driven at 33.9 and 3.3 lux.

1
camera: no stereo pair, no LiDAR

0.06
frames a second lost: 30.04 in from the camera, 29.97 out with depth

3.3 lux
and the map still recognised the places the car came back to

48%
of one RTX 4090 graphics card, mapping live

THREE MODEL SIZES ON A PUBLIC DRONE BENCHMARK

MODEL	ERROR	PER FRAME
Large	1.67 m	92 ms
Base	2.02 m	36 ms
Small	2.29 m	22 ms

The large model is the most accurate; the small one is four times faster. The choice depends on the robot, not the paper.

NEXT That closes Part 3. Part 4 is what I build for myself, starting with the workshop at home.

PART 4

Beyond work

What I build for myself, and why it matters to clients

Evenings and weekends are where new tools get tried before they reach a client: a workshop of small machines, an offline finance app, a video engine, and Sea Wake, the passion project where everything goes into one world.



58 **The workshop at home**
What the shop could not sell



60 **Saku, BinaTOEFL and templates**
Tools that look back, or feel like a wall



61 **Reel and film engines**
Demos that blur, apps nobody explains



62 **Sea Wake, a passion project**
Every skill, in one world

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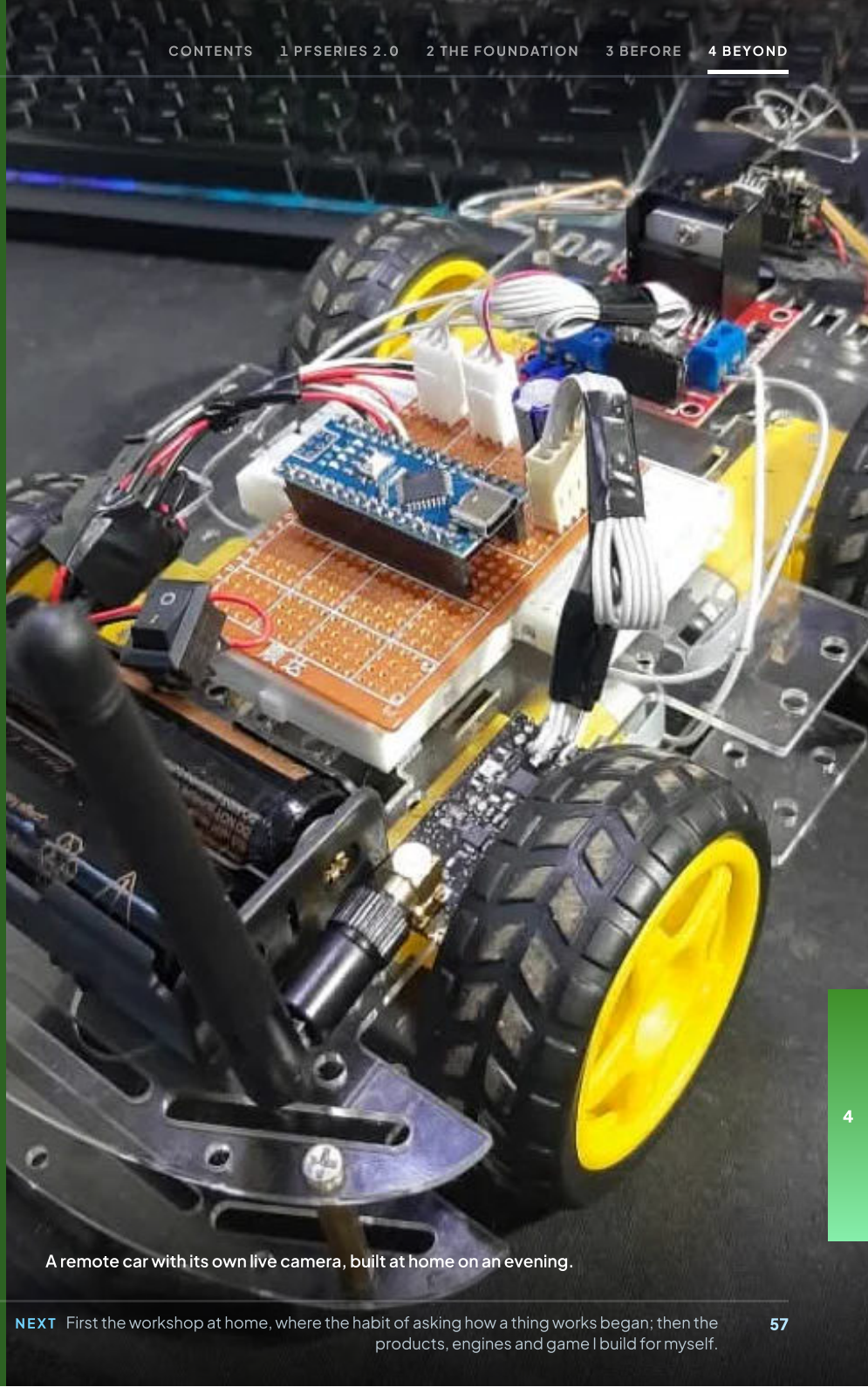
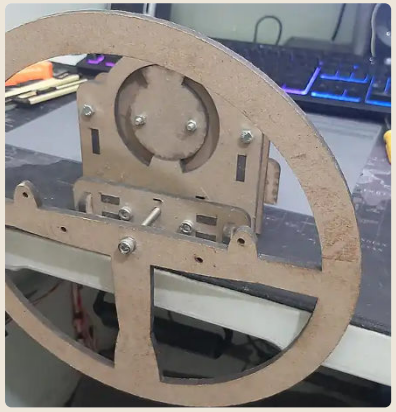


A remote car with its own live camera, built at home on an evening.

The workshop at home

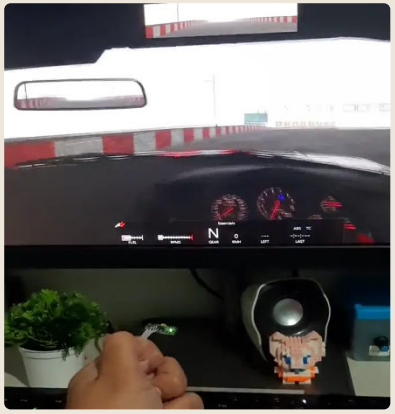
Things built at home because the shop could not sell them, or sold them at a price that made no sense: a 900 degree force-feedback wheel, a head tracker, a 25 kHz fan controller, a water tank that measures itself, a water heater, an air filter. Each one began with a question about how something works.



IDR 120,000

A 900 degree force-feedback wheel

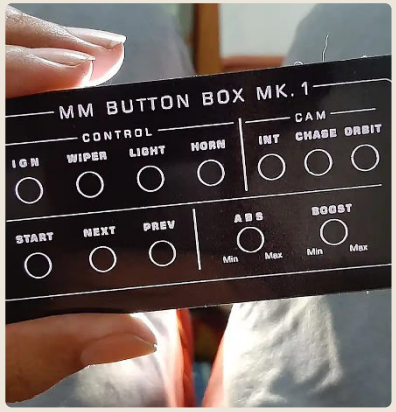
Five times the rotation of version one, three pedals, a frame that stays on the desk.



IDR 50,000 VS 6.5 MILLION

A head tracker

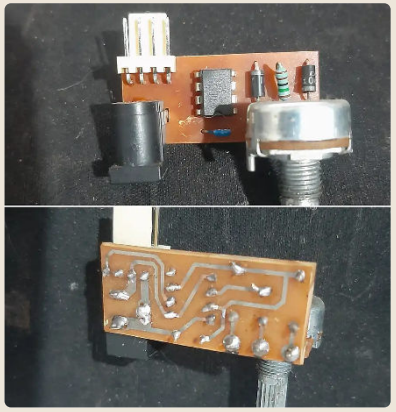
Turn your head toward a corner and the in-game camera turns with you. It sticks to the side of a headset.



LASER CUT

A button box with a backlit faceplate

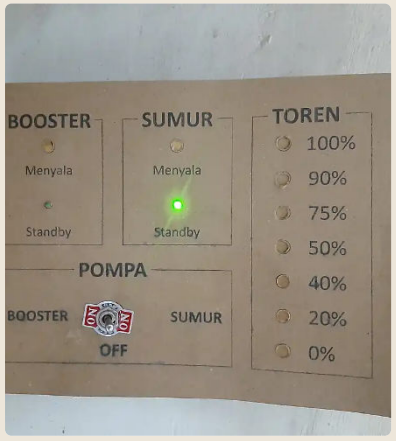
The first thing the laser cutter made, misaligned first attempt included.



ELECTRONICS

A 25 kHz fan controller, no oscilloscope

Designed around a 555 timer in an online simulator, with parts I could actually buy.



FOUR SENSORS

A water tank that measures itself

Air pressure, ultrasonic and laser all failed; the fourth sensor cost almost nothing.



PHYSICS FIRST

A water heater built on one fact of physics

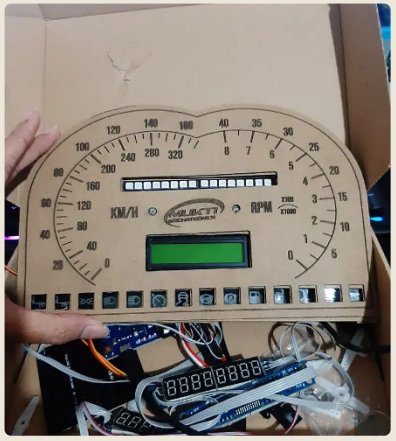
Hot and cold water in a tank do not mix, so a single-pipe house could have hot showers.



TWO VERSIONS

An air filter that taught me CAD

Version one in laser cut MDF; version two in cardboard and tape. Both clean the air.



PROTOTYPE

A racing dashboard

A laser cut gauge face, an LCD and the wiring behind it, driven by the game's telemetry.



POOR MAN'S FORCE FEEDBACK

Each version's flaws became the specification for the next.

50k
rupiah for a head tracker that sells for 6.5 million

900°
of force-feedback steering for IDR 120,000

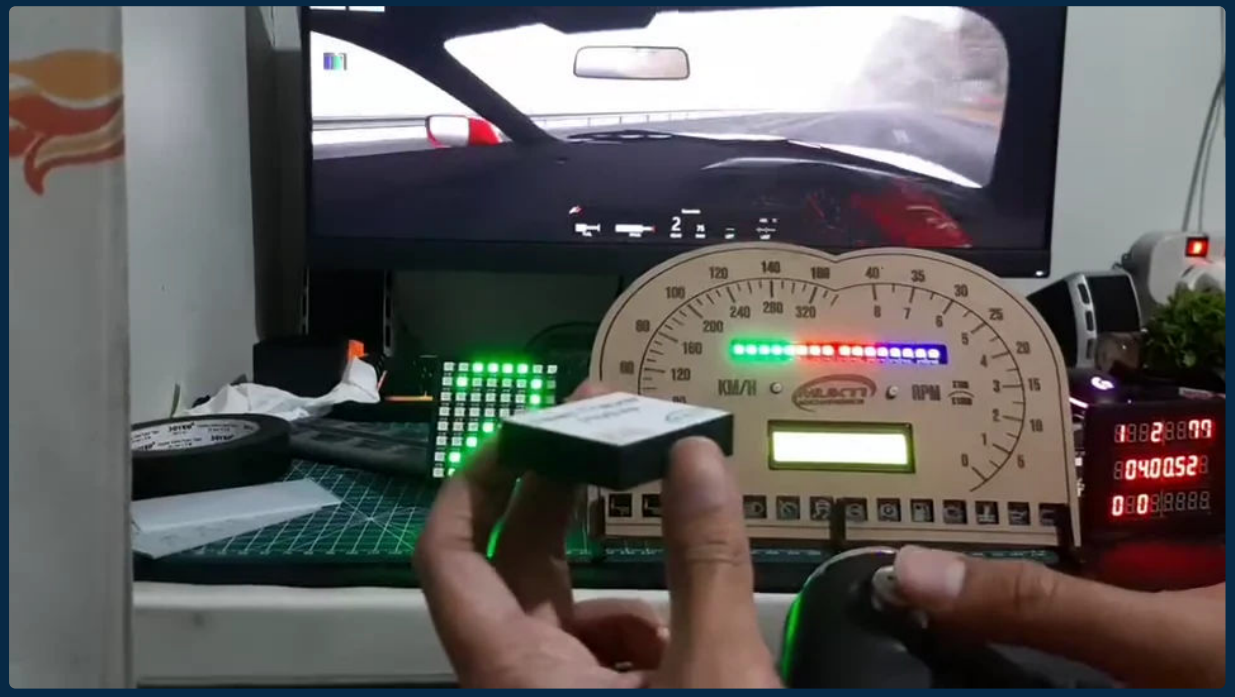
Use what is cheap and already there, and spend the effort on the part that matters: the same instinct that later chose Power BI over a new app, and WhatsApp over a new login.

LEARNED *a cheap first version reveals the real requirements, so the steering wheel's flaws became the specification for the next one.*

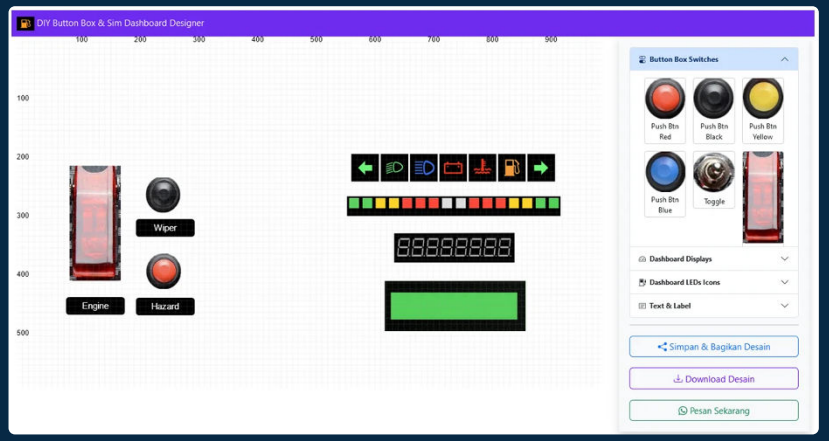
NEXT The builds did not stay on the desk: they were driven, sold and shown.

Off the desk: driven, sold and shown

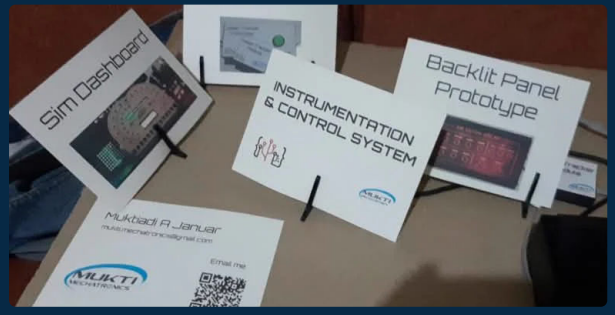
The builds did not stay on the desk. The dashboard runs with a driving game, the laser cutter earned its keep engraving name tags for a pet shop, a designer in the browser let a buyer lay out their own button box, and a table of prototypes went to the Itenas living lab for visitors to try.



The dashboard running with a driving game: rev lights, speed and gear readouts that follow the car, behind a backlit button box.



Mukti Mechatronics, 2023: a clickable designer where a buyer lays out their own button box before the workshop cuts and wires it.



The table at the living lab showcase: sim dashboard, head tracker, instrumentation and the backlit panel



Explaining the sim rig to a visitor, students from the lab alongside



Purrfect.Tags: pet name tags engraved for one shop near home.

½

Almost half the laser cutter, paid for by one pet shop's engraved name tags. My only regret is not starting sooner.

Products for myself

WHAT IT IS Products I own end to end: Saku, a finance app that looks forward and works offline; BinaTOEFL, a TOEFL course explained in Indonesian; and templates that show a whole product in an afternoon.

Discover.

Money apps only look back at what was already spent and stop working when the signal drops; TOEFL preparation feels like a wall of long tests explained only in English.

Design.

Products I own end to end, from the first screen to the server. They are where I try a new idea before it reaches a client.

Deliver.

Saku live at saku.muktiadi.com, BinaTOEFL with hundreds of practice items explained in Indonesian, and templates that show a whole product in an afternoon.

Saku, money that looks forward

A forecast of what comes next with what-if scenarios, an offline queue that syncs later, and an assistant that only ever proposes drafts you confirm.

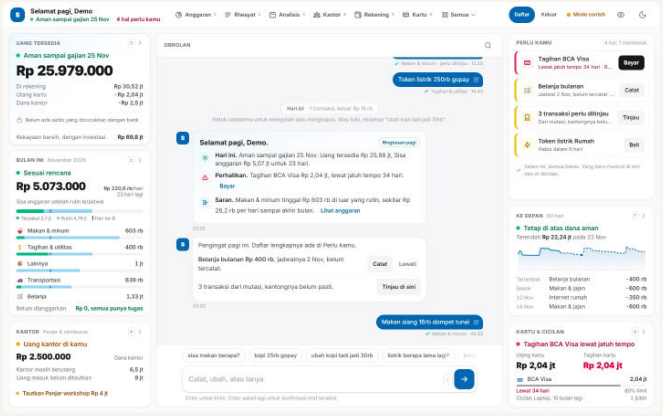
ANY SIGNAL

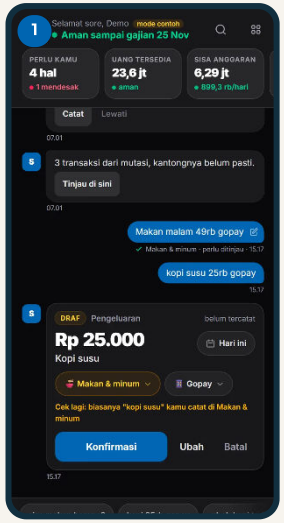
BinaTOEFL, five questions a day

A 42-unit path with 480 practice items, each explained in Indonesian, and points from practice that unlock a full simulated test.

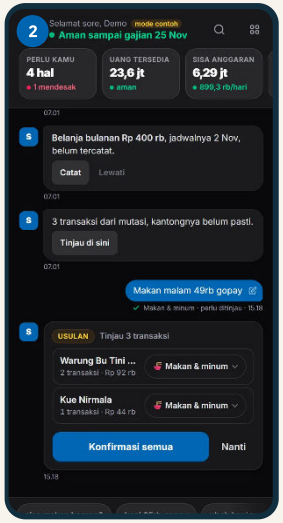
ANY PHONE

SAKU · MONEY THAT LOOKS FORWARD, LIVE AT SAKU.MUKTIADI.COM (DEMO DATA)

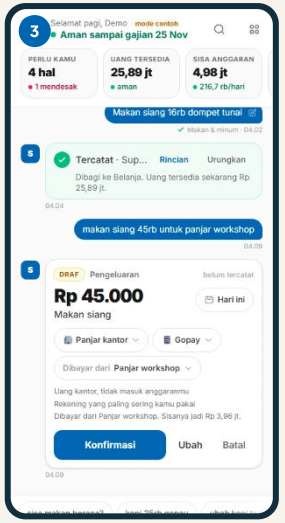




The assistant drafts

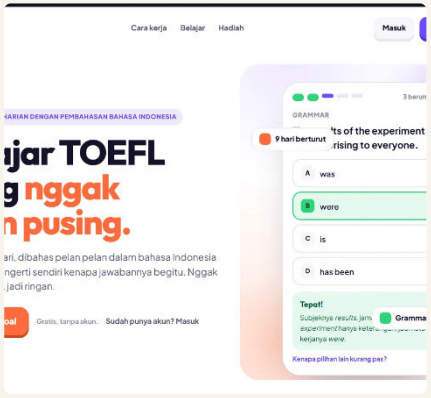


It says what it is unsure of

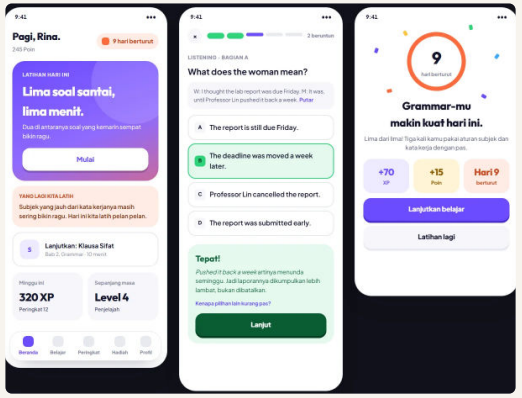


You confirm

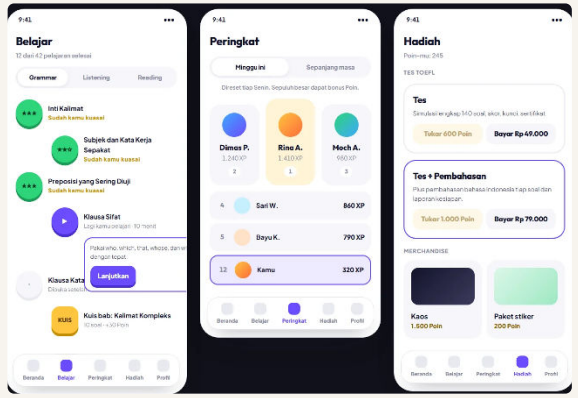
BINATOEFL · FIVE QUESTIONS A DAY, EVERY OPTION EXPLAINED IN INDONESIAN



The landing page



Practice, a streak and a level on the phone



Points from practice unlock rewards



A language school template



Its operations system



A donation site template

480
TOEFL items, each option explained

1 day
to build Patungan, from idea to a shared link

LEARNED *archiving an account made money vanish from the budget, so archiving now only hides, and tests prove money is conserved.*

NEXT Every reel frame in this book came out of one of these side projects: an engine that renders video from code.

Videos rendered from code

WHAT IT IS An engine that renders product reels and narrated films from code: a timeline written in HTML, captured frame by frame in headless Chrome, with music and sound, in portrait and landscape.

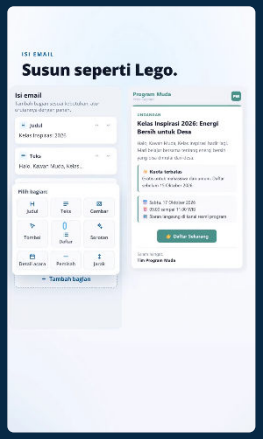
Discover.
An app that people only understand once someone walks them through it, and a screen recording that turns small text into a blur on a phone.

Design.
An engine that renders a timeline written in HTML into video, frame by frame, in headless Chrome. Products explained in about a minute.

Deliver.
Dozens of reels delivered in portrait and landscape. Every reel frame in this book came out of it.



Selection with AI



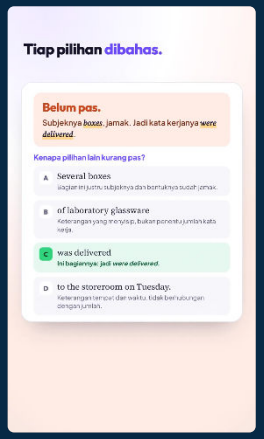
Broadcast email



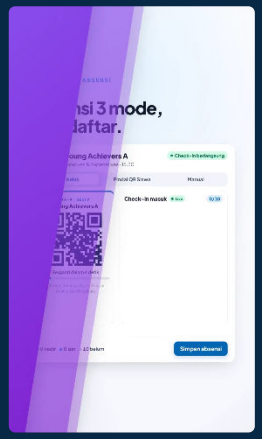
Signing ceremony

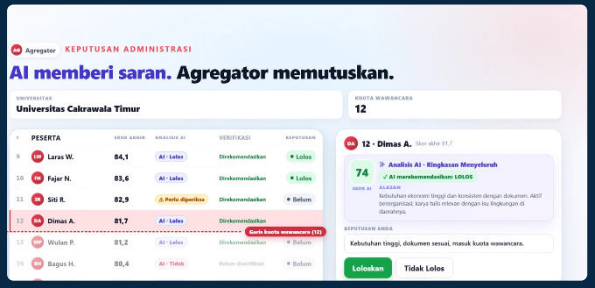


Cash advances



BinaTOEFL


Language school



Landscape cut: selection with AI



A narrated film, rendered from a brief



A partner cut of the same product

Paper cannot move. Scan to watch the reels.

Sharp at any size
The product's own screens, colours and words rebuilt with example data, then rendered frame by frame with real motion blur.
ANY PHONE

One reel per viewer
A cut for each audience, from the same scenes.
PEOPLE DECIDE

Every shape a channel wants
9:16 and 16:9, at 1080p and 720p, with music and sound effects.
ANY PHONE

From a brief to a film
A second engine turns a brief into a narrated film with an AI writer, art and voice, checked by AI judges, then rendered the same way.
KEPT APART

LEARNED *timers and transitions make frames impossible to repeat, so every element is computed from time alone, which unlocked real motion blur.*

NEXT The last project goes furthest: a game engine, built to test how far one architect can direct AI agents.

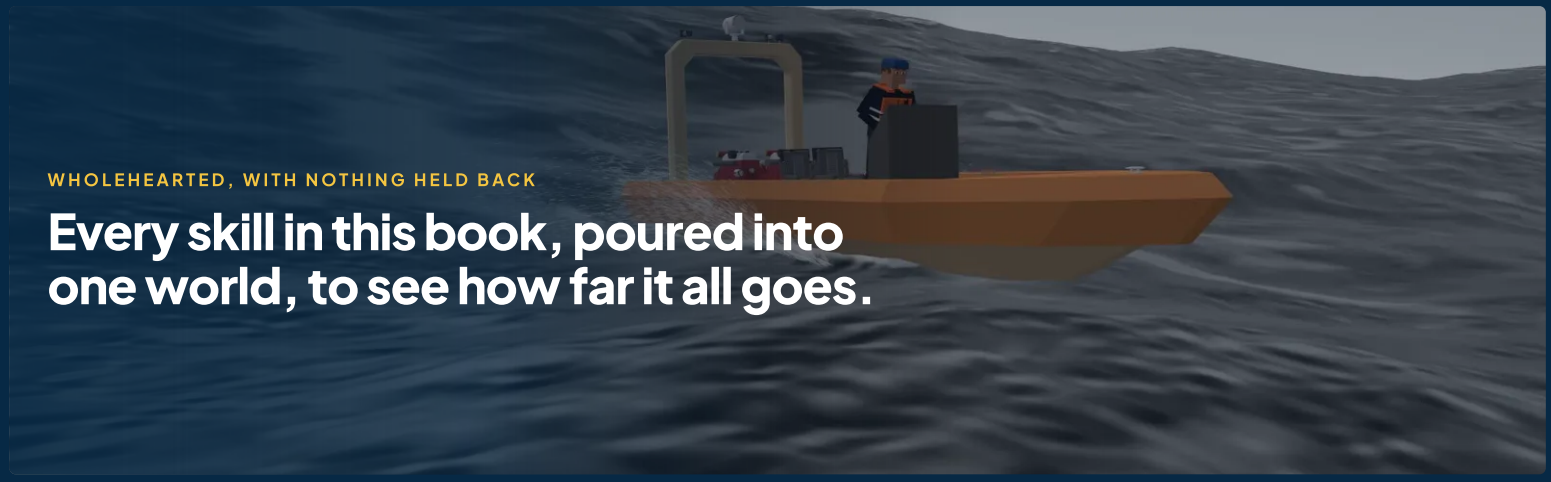
Sea Wake: everything I know, in one world

WHAT IT IS Sea Wake is my passion project: a boat-building game on an engine of my own, with a simulated ocean, weather, electrics and rescue missions. It is where I pour everything I have learned into one world, wholeheartedly, to explore how far each skill can go.

Discover.
Every project before this used one slice of what I know: control systems in the workshop, platforms at the foundation, films from code. I wanted one world where all of it goes in at once, with nothing held back, to find the limits.

Design.
A sandbox on my own Rust engine. I set the vision, the architecture rules and the gates, and directed up to four AI agents to build it with me.

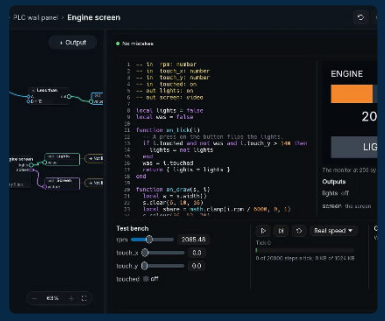
Deliver.
From a single cube on an empty ocean to a cargo ship in a storm in ten days: naval physics, electrics, weather, rescue and a game that films its own devlog.



WHOLEHEARTED, WITH NOTHING HELD BACK

Every skill in this book, poured into one world, to see how far it all goes.

WHAT WENT IN, AND WHERE IN THIS BOOK IT WAS LEARNED



Electrics, PLCs and microcontrollers
Batteries, breakers and lamps wired on layers; controllers you program in Lua.
FROM CONTROL SYSTEMS, P. 52



A helm console you design
Gauges, switches and screens placed on a dashboard of your own.
FROM THE RACING DASHBOARD, P. 59



Weather, tides and rescue
Moving weather, 2.5 m spring tides, search and rescue calls at night.
FROM SURVEYS IN THE FIELD, P. 45



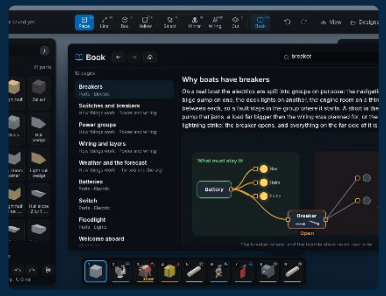
Hulls that flood honestly
Compartments found per launch; a capsized hull traps air and floats.
FROM A SEMESTER OF MECHANICAL ENGINEERING, P. 52



Building from blocks
Boats and cars from 20 cm blocks, up to a 392,000-block cargo ship.
FROM CAD AND THE WORKSHOP, P. 58



A game that films itself
Every feature lands with its film, recorded by the game from a script.
FROM THE VIDEO ENGINES, P. 61



A book inside the game
A hundred and ten pages of in-game guide, written with each feature.
FROM GUIDES DRAWN FROM LIVE SCREENS, P. 25



New ground, to the limit
Naval hydrodynamics, an FFT ocean, shaders and procedural sound: all first attempts.
LEARNED HERE, FROM SCRATCH

FOLLOW THE BUILD

animasa.com
The studio site: the game page, a public roadmap and a bug tracker.

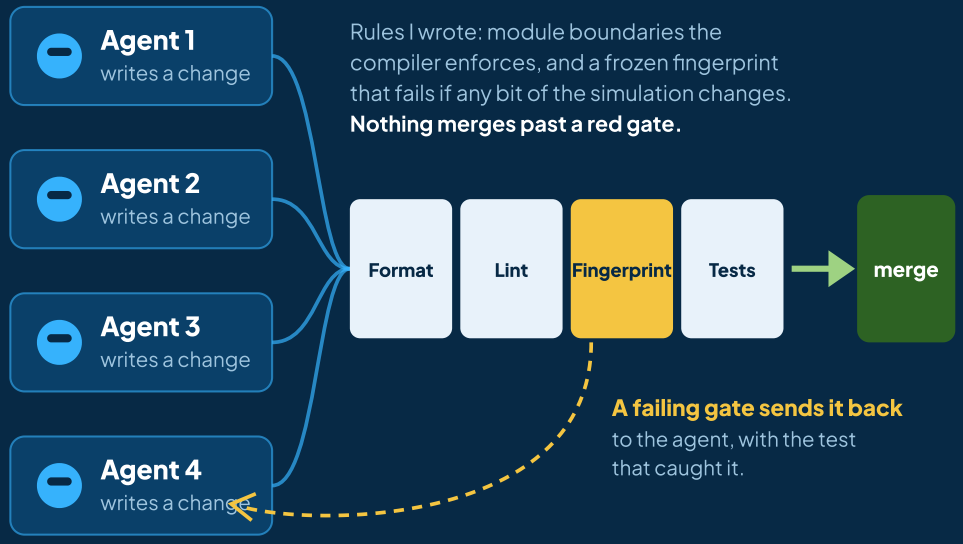
LEARNED *a project you love is where you find your limits, so I let this one take everything; and since agents type it, I chose Rust, which refuses to compile the memory bugs I would otherwise have to catch by eye.*

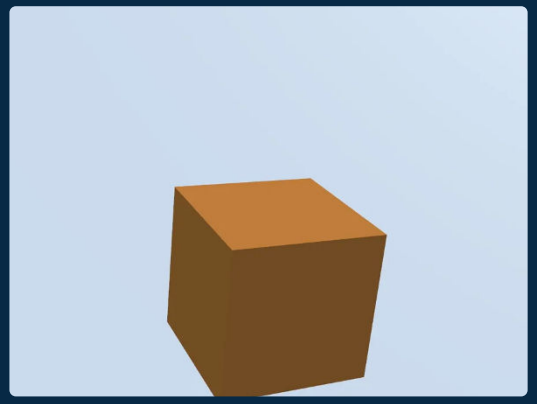
NEXT How one person builds a world this size: the rules, the gates, and four AI agents.

Directed, not typed: one person, four agents, one world

A world this size is more than one person can type in ten days. So I wrote the vision, the architecture rules and the gates, and directed up to four AI agents working in parallel against them. The method, not the line count, is the point.

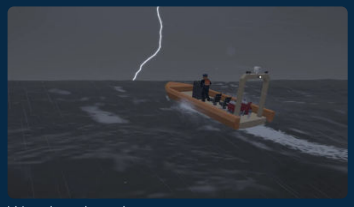
HOW ONE ARCHITECT DIRECTS FOUR AGENTS

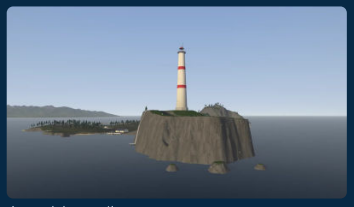


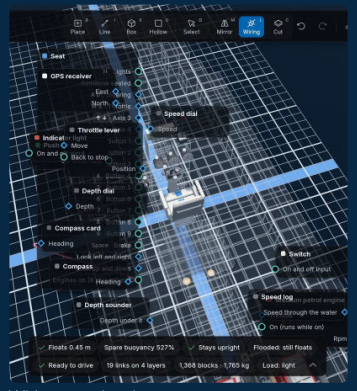

Day one: a cube on an empty ocean

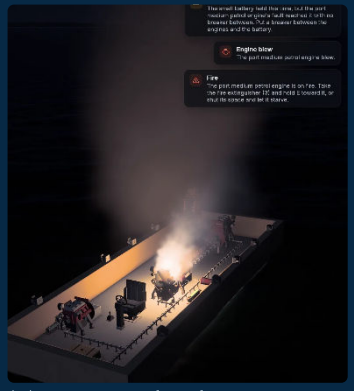

Day ten: fire on board at dusk

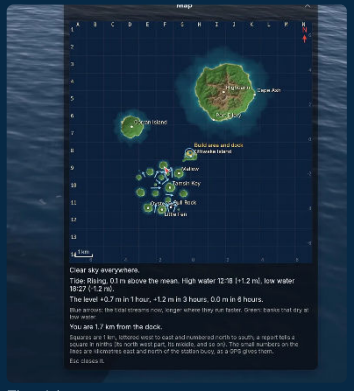

The helm console


Weather that changes


A world to sail to


Wiring a navigation set


A damage report after a fire


The tide map

10
days from an empty repository to a storm at sea

1,786
tests every change must pass before it merges

392,119
blocks in the cargo ship, re-meshed in under a millisecond

Rules the agents cannot break
A frozen fingerprint test fails if any bit of the simulation changes; the compiler enforces module boundaries; nothing merges past format, lint and 1,786 tests.
ON THE RECORD

Physics that does not cheat
Buoyancy per hull piece, planing lift and friction from naval references, and trapped air that keeps a capsized hull afloat.
PEOPLE DECIDE

One ocean for physics and pictures
One wave spectrum driven by the wind, computed once and shared by both.
KEPT APART

A devlog that cannot exaggerate
A tool reads the game's own history and has the game film each episode from that day's build.
ON THE RECORD

Stills from footage the game recorded of itself. About 276,000 lines of Rust in ten days, typed by agents against rules I wrote.

Built to keep working when things go wrong

Every system in this book, set against the same six failures: the habit of designing for what goes wrong, not the happy path.

SYSTEM	Weak or no signal old phones, rural networks	A crash mid-task closed tab, dead battery	Everyone at once deadline night, a full hall	One part down a server, a carrier, a vendor	A mistake with live data a bad release, a wrong list	Proof it is real audit, QR, signatures
PFSeries 2.0 p.8	Light pages from the edge; uploads detour six ways	Form saved as you go; a failed save stays with a retry	Parts kept apart; email in throttled batches	A heartbeat names the slow part; maintenance without a release	Guarded scripts: dry run, backup, refuse when unsure	Audit trail, QR certificates, IDs with a check character
Case Challenge recorder p.19	Video sent in parts while the team talks	Resumes from the first part that did not land	Teams start any time in a window of days	Each part tries several ways in	A rehearsal proves the path before the real attempt	Four server checks before the parts are stitched
Sobat Bumi judging p.17	A tap is a saved score; a failed save rolls back		Hundreds of judges on one-link seats, no accounts		The final list checked name by name against the decree	Every score on the record, by seat and time
PFdrive p.29	Installable; files handled on the device			Short links keep working when the main server is down	No one approves their own request	PDFs verifiable by QR; history as a side effect of work
Attendance and live Q&A p.29	Taps saved on the phone and sent safely	Retries never double count	A whole hall checking in at once		Moderators choose what reaches the screen	Attendance anonymised after the event
SESAMA field app p.36	The whole list on every device		A community served in one day	Prints over USB or Bluetooth with no network	A handover counts only when its photo is confirmed	Numbered slips; QR codes with no personal data
Command Center p.36		A stuck window reopens itself		Screens and server watched; the room heals itself	IT works on a screen the room never sees	Totals only; names never reach the room
Signing Ceremony p.36	Only pen strokes cross the network	A reconnecting screen redraws the ink exactly	Any number of screens follow one pen			A vector PDF for the archive
Scholar contracts p.26					Launch test as one fake scholar, traces removed after	The signed text checked to the character
Money and advances p.38					A history nobody can rewrite	Every printed document verifiable by QR
Lestari field camera p.45	Works offline; waits for a good GPS fix	A day's work exported as one file				Tree IDs with two check characters
Saku p.60	An offline queue that syncs later	Nothing lost when the app closes			AI proposes drafts, never bookings	
Balongan platform p.49	A field network built for the response		Every damaged house in a month		Bank files only from approved records	Passed the insurance and the state audits

LEARNED *every row here grew from a failure that really happened in one of these systems, so the next system starts with the fix built in.*

NEXT What all of this says about how I work, with the pages that prove each habit.

How I work

The habits you have already seen at work in this book, grouped the way my name card reads, each with the pages that prove it. The claim comes after the evidence.

Discover.

Sit with the person who owns the problem

A brief is someone's guess at the problem; the person who lives with it every day knows where it really hurts.

Eight parties, one record 49
The decree as the only truth 17
Five rounds with a sponsor 24

Find the root cause, not the symptom

A fixed symptom comes back on the busiest day; a fixed cause stays fixed.

Uploads dying at 0%: carriers 8
Office outages, not service ones 36
Green health, broken uploads 25

Design.

Build the working thing first

Nobody can judge a document, but everyone can use a prototype, and what they do with it is the real requirement.

PFSeries began as mockups 8
A prototype in one night 38

Design for the worst connection

If it works on one bar of signal on deadline night, it works everywhere else.

Video sent while talking 19
A field app with no signal 36

Let AI read, keep people deciding

AI reads thousands of pages without tiring, but a decision about a person needs a name that answers for it.

Need before merit, advisory 17
A panel view with no score 19

Deliver.

Make every change recorded and reversible

Mistakes will happen; what matters is that each one can be seen, explained and undone.

Guarded scripts, journals 25
Histories nobody rewrites 38
A contract checked at signing 26

Write it so others can build it

A system only one person understands stops the day that person leaves.

A tender package 43
Guides from live screens 25

HOW THE CODE GETS TYPED

Most of the code in this book was typed by AI coding agents, working under rules I wrote.

An engineering memory per repository, tests that freeze behaviour, merge gates, scripts that refuse to run unguarded. The architecture, every decision, every review and every production run are mine.



Decks that ask for decisions

Plans written for directors as outcomes and decisions with milestones, never a shopping list of technology.

As-is pages that tell the truth

Every plan starts from an honest page of what runs today, including what is not done yet.

Build or buy, written down

Self-hosted where it is cheaper and safer, with written triggers for when to pay a vendor instead.

Teaching what I learn

Training staff on new systems, guides drawn from live screens, and courses turned into knowledge transfer for the team.

LEARNED *equal options look undecided and an early pick looks biased, so I weigh the options first, then recommend one with confidence.*

NOTES AND COLOPHON

About this book

How to read it

Every chapter opens the same way: Discover the pain, Design the system, Deliver the change.

The foot of each page gives one thing learned and why the next page follows. The tabs at the top and on the page edge jump between parts; in the PDF every page number and title is a link.

What is real, and what is drawn

Screenshots use example or demo data; names, ID numbers and contacts are blurred or replaced. Dashboards redrawn as diagrams use illustrative values.

Where the work is under a non-disclosure agreement, charts show shape, not counts. Proposals are labelled as proposals, visualisations and AI renders as such.

Who else built what

The awards went to the PF Lestari team. A colleague built most of the grant portal; teammates extended ONE LoOK; P-Mobile is the group's app, not mine. The living lab's projects belong to its student teams.

Photographs come from colleagues, event coverage and my own camera.

How it was made

One source with muktiadi.com/work: the same components draw the web pages and this book, printed by a headless browser. Diagrams and illustrations are drawn in code.

Set in Plus Jakarta Sans. 2026 edition, 24 November 2026.

Made with the habits it describes: one source for the web and the page, every page looked at as a picture before it ships, and every number traceable to a file, a commit or a person.

THE DRAWINGS IN THIS BOOK, ALL MADE IN CODE



ABOUT THIS BOOK

Ten years of systems people run on, told the way they were built.

A national selection platform used by more than 80,000 people, many on the oldest phone in the house. AI that reads and drafts while a named person decides. A refinery crisis platform that later passed the state audit. Field tools for a reforestation programme, and the workshop where it all began. Each chapter opens the same way: discover the pain, design the system, deliver the change, and says plainly what broke and who else built what.

The living version of this book
muktiadi.com/work

INSIDE

1 PFSeries 2.0
One platform, every programme, each choosing people its own way

2 Running a foundation on software
The same habits, pointed at very different problems

3 Before the foundation
Where the habits came from

4 Beyond work
What I build for myself, and why it matters to clients

80,000+
people on the platform every foundation programme runs on

500+
judges scoring from a link and a PIN, no accounts

Platinum
Annual Pertamina Quality Award 2026, with the PF Lestari team

Discover.
Design.
Deliver.

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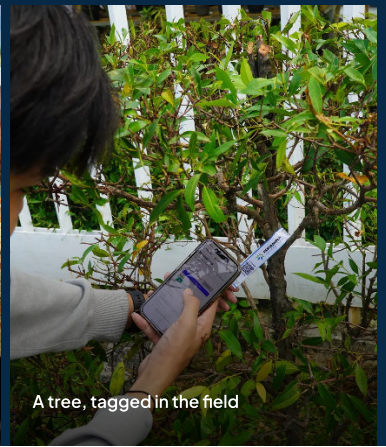
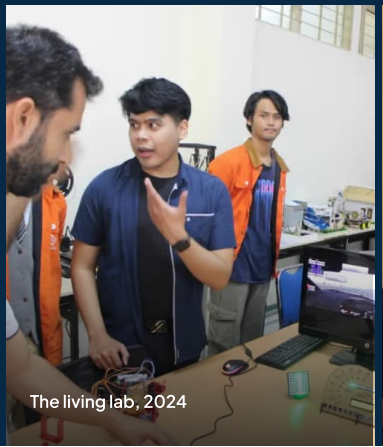
linkedin.com/in/muktiadi


In front of leadership, 2026


A tree, tagged in the field


Balongan handover day, 2021


Erasmus+, Budapest, 2018


The living lab, 2024



The grooming mirror