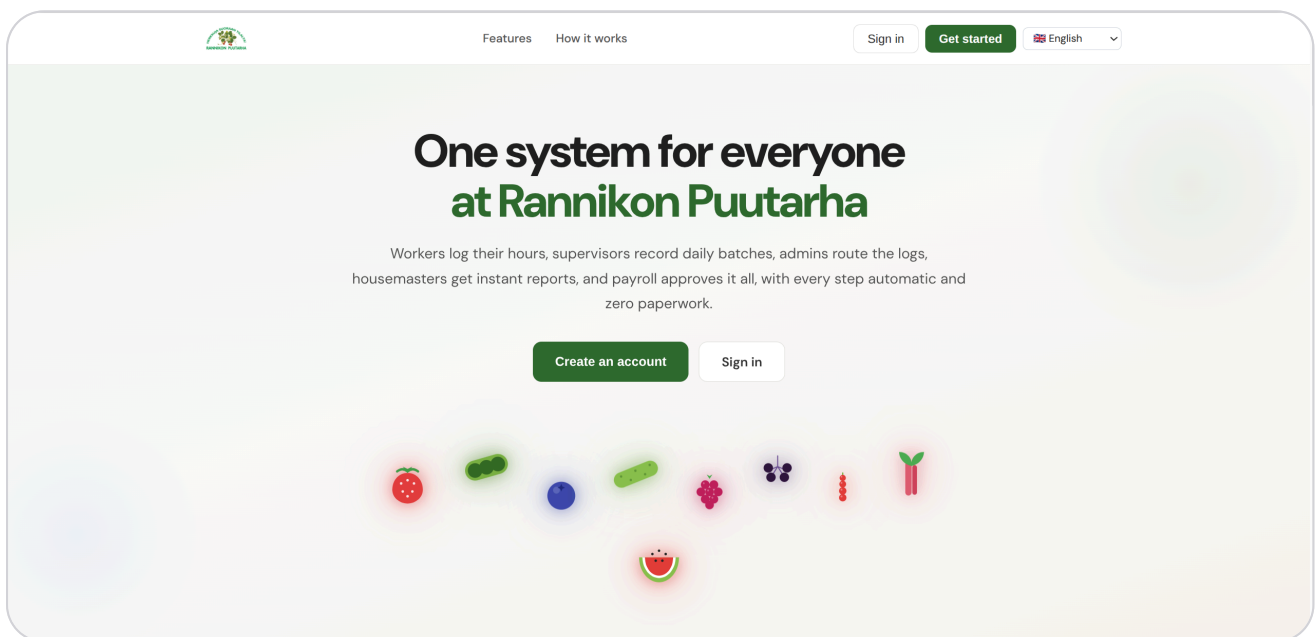


Rannikon: Building a Full-Stack Farm Timesheet System from Scratch

How I designed, built, and deployed a complete workforce management platform for Rannikon Puutarha berry farm in Finland, serving 300+ seasonal workers across 6 house groups in 5 languages.

01 · The Overview



Rannikon Puutarha landing page

Rannikon Puutarha is one of Finland's largest berry farms, located in Halikko, Southwest Finland. Every season they employ over 300 seasonal workers from Ukraine, Cambodia, Vietnam, Nepal, and beyond, each required to track their daily working hours across four official payroll paper forms: the white paper, orange paper, weekly summary, and green paper.

Before Rannikon existed, every worker filled these forms by hand. Every calculation was done manually. Supervisors recorded arrival times in notebooks. Payroll staff spent days verifying hundreds of paper submissions at the end of each month. Mistakes were common. Disputes over hours happened regularly.

I built Rannikon to solve all of this.

02 · The Challenge

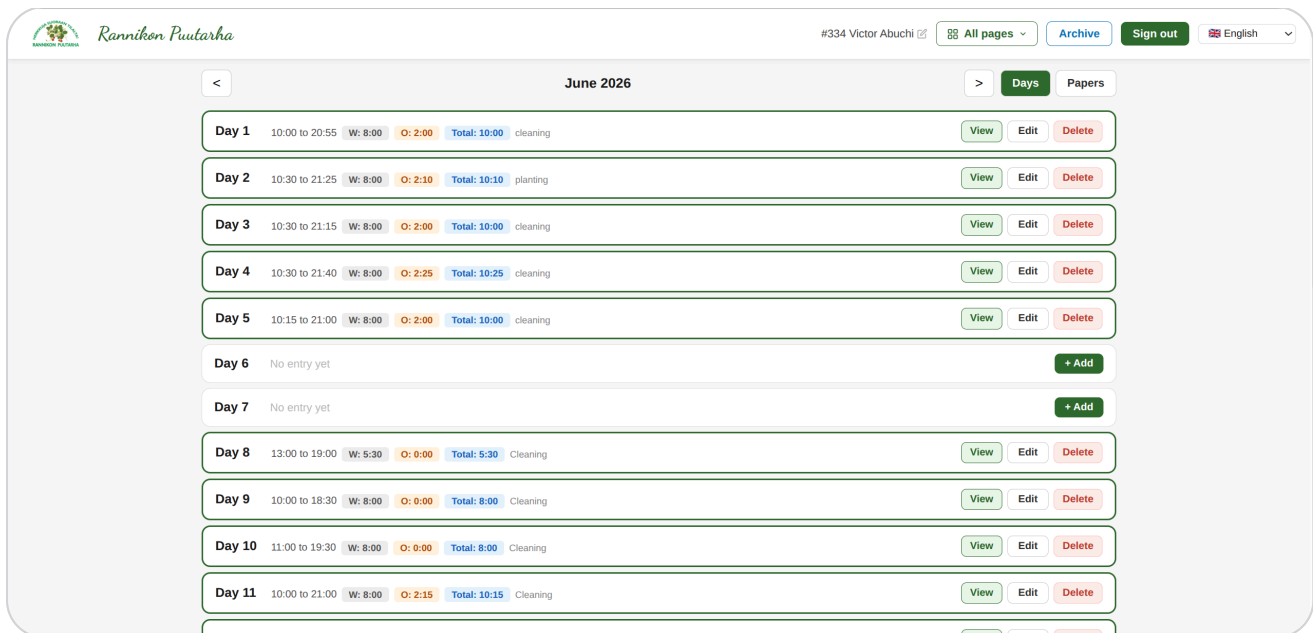
The farm had no digital system for tracking worker hours. The existing process:

- Workers arrived at the farm and supervisors wrote down their work numbers and start times in notebooks
- Workers manually calculated their own hours across 4 different paper forms
- Calculation errors were frequent: the formula for white paper, orange paper, and weekly summary is complex
- Supervisors sent handwritten daily logs to housemasters via Facebook groups
- Housemasters manually sorted logs by house group and forwarded to payroll
- Payroll staff received hundreds of paper submissions monthly with no way to verify them against original supervisor records

The farm manager, Lina Rannikko, had no digital visibility into daily operations. The payroll team, led by Aleksi and Johanna, had no automated verification system.

03 · The Solution

I approached Lina Rannikko directly and proposed building a complete digital workforce management system. She approved the project, and I built the entire system solo over several months.



Dashboard overview

Rannikon is a full-stack SaaS application with:

- A web app at rannikon.com
- A native Android mobile app on Google Play Store
- A Fastify REST API at api.rannikon.com
- A PostgreSQL database hosted on Supabase EU
- Deployed on Render with auto-deploy from GitHub

04 · The Calculation Engine

The core of the system is the automatic hour calculation engine. Workers enter three values: actual start time, actual finish time, and total break duration. The engine automatically calculates:


Rannikon Puutarha

#334 Victor Abuchi

All pages

Archive

Sign out

English

<

June 2026

>

DaysPapers

Day 1

10:00 to 20:55

W: 8:00

O: 2:00

Total: 10:00

cleaning

HideEditDelete

WHITE PAPER: WORK PAID BY THE HOUR
 8 HOURS PER DAY / 40 HOURS PER WEEK

Date	Start	Finish	Must have Eating break	Hours minus breaks	What work
1	10:00	18:30	30 min	8:00	cleaning

When you have worked 4 hours, You need to have an eating break, minimum of 30 mins. START WORK 9:00, 9:15, 9:30 or 9:45.

ORANGE PAPER: EXTRAWORK PAID BY THE HOUR
 MAXIMUM 3 HOURS PER DAY (MONDAY-FRIDAY) | MAXIMUM 11 HOURS PER DAY (SATURDAY)

Date	Start	Finish	Break	Hours minus breaks	What work	Signature
1	18:30	20:55	0:25	2:00	cleaning	

Start work 9:00, 9:15, 9:30 or 9:45. Work does not start 9:05, 9:10, 9:20, 9:25 etc.

WEEKLY SUMMARY

Type	Mon	Tue	Wed	Thu	Fri	Sat (max 11)	Sun	Total hours
Berry picking (kg)							X	
Reg hrs (max 8)							X	8:00
Extra hrs (max 3)							X	2:00
Total							X	10:00

GREEN PAPER — TIME USED FOR PICKUP, SALARY IS PAID BY KILOS

Date	Start	Finish	Must have Eating break	Extra Breaks	Hours minus breaks	What was picked	Kg picked
1			1 hour				

HOX, NEED TO PICKUP 10 KILO PER HOUR!

Days view with hour badges

White paper: work paid by the hour

- White start = actual start time
- White finish = actual start + 8 hours + eating break (30 min if break is 30 min or more)
- White hours = always 8:00 (or less if worker finished early)
- Extra breaks = total break minus 30 minutes eating break

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June 2026

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DaysPapers

PAPERS

White Paper
Work paid by hour

Orange Paper
Extrawork

Weekly Summary
Mon to Sun totals

Green Paper
Berry picking

WORK PAID BY THE HOUR
 8 HOURS PER DAY / 40 HOURS PER WEEK
 Name: Victor Abuchi Work number: 334

Date	Start	Finish	Must have Eating break	Hours minus breaks	What work
1	10:00	18:30	30 min	8:00	cleaning
2	10:30	19:00	30 min	8:00	planting
3	10:30	19:00	30 min	8:00	cleaning
4	10:30	19:00	30 min	8:00	cleaning
5	10:15	18:45	30 min	8:00	cleaning
6			30 min		
7			30 min		
8	13:00	19:00	30 min	5:30	Cleaning
9	10:00	18:30	30 min	8:00	Cleaning
10	11:00	19:30	30 min	8:00	Cleaning
11	10:00	18:30	30 min	8:00	Cleaning
12	16:45	20:15	30 min	3:30	Cleaning
13	14:00	18:00	30 min	3:45	Cleaning
14			30 min		
15	12:15	15:35	30 min	3:20	Cleaning
16	14:00	20:45	30 min	4:30	Cleaning
17	12:00	14:20	30 min	2:20	Cleaning

White paper

Orange paper: extra work paid by the hour

- Orange start = white finish

- Orange finish = actual finish
- Orange break = same as extra break on white paper
- Orange hours = orange finish minus orange start minus orange break


Rannikon Puutarha
#334 Victor Abuchi
All pages
Archive
Sign out
English

June 2026
>
Days
Papers

PAPERS
White Paper
Orange Paper
Weekly Summary
Green Paper

EXTRAWORK PAID BY THE HOUR
MAXIMUM 3 HOURS PER DAY (MONDAY-FRIDAY)
MAXIMUM 11 HOURS PER DAY (SATURDAY)
Name: Victor Abuchi Work number: 334

Date	Start	Finish	Break	Hours minus breaks	What work	Signature
1	18:30	20:55	0:25	2:00	cleaning	
2	19:00	21:25	0:15	2:10	planting	
3	19:00	21:15	0:15	2:00	cleaning	
4	19:00	21:40	0:15	2:25	cleaning	
5	18:45	21:00	0:15	2:00	cleaning	
6						
7						
8						
9						
10						
11	18:30	21:00	0:15	2:15	Cleaning	
12						
13						
14						
15						
16						

Orange paper

Weekly summary: auto-generated from all entries

- Working hours row (max 8 per day)
- Extra hours row (max 3 per day Monday to Friday, max 11 Saturday)
- Berry picking kg row
- Total hours per day and per week


Rannikon Puutarha
#334 Victor Abuchi
All pages
Archive
Sign out
English

June 2026
>
Days
Papers

PAPERS
White Paper
Orange Paper
Weekly Summary
Green Paper

WEEKLY SUMMARY
Name: Victor Abuchi Work number: 334

WEEK 1

	Mon max 3	Tue max 3	Wed max 3	Thu max 3	Fri max 3	Sat max 11	Sun	total hours
Berry picking (kg)							X	kg
Reg hrs max 8	8:00	8:00	8:00	8:00	8:00		X	40:00 max 40
Extra hrs / lisatyö	2:00	2:10	2:00	2:25	2:00		X	10:35 max 17/week

yes, I want to work extra hours ☐ Signature: _____

WEEK 2

	Mon max 3	Tue max 3	Wed max 3	Thu max 3	Fri max 3	Sat max 11	Sun	total hours
Berry picking (kg)							X	kg
Reg hrs max 8	5:30	8:00	8:00	8:00	3:30	3:45	X	36:45 max 40
Extra hrs / lisatyö	0:00	0:00	0:00	2:15	0:00	0:00	X	2:15 max 17/week

yes, I want to work extra hours ☐ Signature: _____

WEEK 3

	Mon max 3	Tue max 3	Wed max 3	Thu max 3	Fri max 3	Sat max 11	Sun	total hours
Berry picking (kg)							X	kg
Reg hrs max 8	3:20	4:30	2:20				X	10:10 max 40

Weekly summary, auto-generated from daily entries

Green paper: berry picking, salary paid by kg

- Separate from field work entries
- Workers enter start time, finish time, kg picked, and what was picked
- No calculation: displays exactly what the worker entered
- Eating break column always shows 1 hour

This calculation engine runs entirely on the backend (Fastify), ensuring all workers see the same accurate result regardless of device or browser.

05 · The Role System

Rannikon has 6 user roles, each with a dedicated page and specific permissions:

Worker

- Logs daily hours
- Views and downloads all 4 papers as PDF or Excel
- Edits any cell directly on the papers
- Submits monthly papers to payroll

Supervisor

The Supervisor panel interface shows a header with the Rannikon Puutarha logo, the title 'SUPERVISOR', and user information '#334 Victor Abuchi'. Navigation links include 'All pages', 'Archive', 'Board', 'Sign out', and 'English'. The main section is titled 'Supervisor panel' and indicates the date 'Saturday, 01 August 2026' with a 'Not today' status. It features a summary bar with 'WORKERS RECORDED' (7), 'TOTAL BREAK' (0 min), and 'BATCHES' (1). A 'Sent to admin' button and an '+ Add workers' button are present. Below this, there are tabs for 'Batches' and 'Work log'. The 'Batches' tab is active, showing a 'Start: 10:00' and 'Finish: 20:00' time range. A row of worker IDs is displayed: #123234, #435, #45, #564, #676, #786, and #334. A '+ Break' button and an 'Edit finish' button are also visible.

Supervisor batch recording page

- Records worker batches at the farm (multiple workers, one start time)
- Records breaks throughout the day (system accumulates total)
- Sets finish time per batch: auto-fills all workers' timesheets
- Sends daily worklog to admin via email
- Exports PDF and Excel of the day's worklog

Housemaster

The Housemaster daily worklog page displays a header with the Rannikon Puutarha logo, the title 'HOUSEMASTER', and user information '#334 Victor Abuchi'. Navigation links include 'All pages', 'Archive', 'Sign out', and 'English'. The main section is titled 'Work logs' and indicates 'Work logs sent to you from the admin'. A 'Refresh' button is located in the top right. The page lists four worklog entries, each with a header bar showing the location, date, and worker count. Each entry has a table of worker details and action buttons (PDF, Excel, Share, Delete).

Work#	Name	Start	Finish	Break	Total hrs	Work done
#678	Unknown	11:30	20:00	45 min	8:00	cleaning

Work#	Name	Start	Finish	Break	Total hrs	Work done
#456	Unknown	11:30	20:00	45 min	8:00	cleaning

Work#	Name	Start	Finish	Break	Total hrs	Work done
#334	Victor Abuchi	11:30	20:00	45 min	8:00	cleaning

Work#	Name	Start	Finish	Break	Total hrs	Work done

Housemaster daily worklog page

- Receives daily worklogs from admin sorted by their house group

- Downloads as PDF, Excel, or image
- Shares to Facebook group or WhatsApp
- Workers are automatically sorted by work number into 6 house groups:
 - 100–199 : Kivilinna / Salo
 - 200–299 : Karton Cambodia
 - 300–399 : Karton International
 - 400–499 : Vassila
 - 500–599 : Suppala
 - 600+ : Salo / Turku

Admin

The screenshot shows the Admin panel for Rannikon Puutarha. At the top, there's a header with the logo, name, and a user profile for #334 Victor Abuchi. Below the header, the 'Admin panel' section includes a sub-header 'Manage workers, view logs, send invitations' and a '+ Invite' button. A summary row displays statistics: TOTAL WORKERS (22), ACTIVE (22), SUPERVISORS (0), HOUSEMASTERS (0), and ENTRIES TODAY (1). Below this, there are tabs for 'Workers', 'Supervisor Logs', and 'Invitations'. The 'Workers' tab is active, showing a search bar and a table with 22 workers. The table columns are Work#, Name, Email, Role, Group, Status, and Actions. The first seven workers listed are all 'worker' roles, 'Active' status, and belong to the '-' group.

Work#	Name	Email	Role	Group	Status	Actions
#117	Kornitska Katya	kornickakaty@gmail.com	worker	—	Active	Worker Deactivate
#202	Mien Sithachanti	miensithachanti@gmail.com	worker	—	Active	Worker Deactivate
#214	Vinhjing Ma	vinhjingma@outlook.com	worker	—	Active	Worker Deactivate
#313	Rojina Basnet	basnetrojina894@gmail.com	worker	—	Active	Worker Deactivate
#316	Hồng Lê Thị Ánh	anhongrs@gmail.com	worker	—	Active	Worker Deactivate
#318	Cao Phạm Thái An	caophamthai2110@gmail.com	worker	—	Active	Worker Deactivate
#323	Tejendra Bhandari	tejendrabhandari722@gmail.com	worker	—	Active	Worker Deactivate
#324	Yubraj Devkota	devkotayubraj9823@gmail.com	worker	—	Active	Worker Deactivate

Admin panel: full worker list

- Views all 300+ workers
- Receives all supervisor daily logs
- Auto-sorts worklogs by house group and work number
- Sends each group worklog to the correct housemaster
- Simultaneously sends to payroll for verification
- Invites new users with role assignment via email
- Manages all roles: worker, supervisor, housemaster, payroll, admin

Payroll



PAYROLL

PAYROLL

Victor Abuchi

88 All pages

Archive

Sign out

Submissions

Daily Logs

Verify

Monthly Hours

Daily Supervisor Logs

08/31/2026

Load

Work#	Name	Group	Start	Finish	Break	Total hrs	Work done
75	—	Unknown	12:00	08:45	45 min	0:00	Cleaning
112	—	Kivlinna/Salo	12:00	08:45	45 min	0:00	Cleaning
121	—	Kivlinna/Salo	12:00	08:45	45 min	0:00	Cleaning
143	—	Kivlinna/Salo	12:00	08:45	45 min	0:00	Cleaning
187	—	Kivlinna/Salo	12:00	08:45	45 min	0:00	Cleaning
234	—	Karton Cambodia	12:00	08:45	45 min	0:00	Cleaning
245	—	Karton Cambodia	12:00	08:45	45 min	0:00	Cleaning
265	—	Karton Cambodia	12:00	08:45	45 min	0:00	Cleaning
276	—	Karton Cambodia	12:00	08:45	45 min	0:00	Cleaning
334	Victor Abuchi	Karton International	12:00	08:45	45 min	0:00	Cleaning
357	—	Karton International	12:00	08:45	45 min	0:00	Cleaning
378	—	Karton International	12:00	08:45	45 min	0:00	Cleaning
387	—	Karton International	12:00	08:45	45 min	0:00	Cleaning
434	—	Vassila	12:00	08:45	45 min	0:00	Cleaning
456	—	Vassila	12:00	08:45	45 min	0:00	Cleaning
467	—	Vassila	12:00	08:45	45 min	0:00	Cleaning
487	—	Vassila	12:00	08:45	45 min	0:00	Cleaning
521	—	Suppala	12:00	08:45	45 min	0:00	Cleaning
534	—	Suppala	12:00	08:45	45 min	0:00	Cleaning

Payroll verification: supervisor vs. worker hours

- Receives daily supervisor worklogs from admin for verification
- Receives monthly paper submissions from workers
- Smart verification system compares supervisor recorded hours vs. worker submitted hours
- Shows match, mismatch, missing from worker, missing from supervisor per day
- Approves, rejects, or flags submissions needing review
- Exports verification reports as PDF

Worker archive: daily worklog visibility

The screenshot shows the 'Worklog Archive' page for Rannikon Puutarha. At the top, there's a header with the logo, name, and a user profile for #334 Victor Abuchi. The main section is titled 'Worklog Archive' with a subtitle 'Every work log the admin has sent to any house -- all groups together, sorted by date.' and a 'Refresh' button. Below this is a calendar for the year 2026, with August highlighted. Two detailed worklog entries are shown: 'Salo/Turku' for 29 August 2026 (1 worker) and 'Vassila' for 29 August 2026 (1 worker). Each entry includes a table with columns: Work#, Name, Start, Finish, Break, Total hrs, and Work done. The data for both entries is as follows:

Work#	Name	Start	Finish	Break	Total hrs	Work done
#678	Unknown	11:30	20:00	45 min	8:00	cleaning
#456	Unknown	11:30	20:00	45 min	8:00	cleaning

Worker archive, chronological worklog history

Every worker can log in and view the archive page, a chronological record of all supervisor worklogs recorded at the farm. Workers use this to cross-check their own recorded hours before submitting to payroll. Worklogs are stored by date and accessible to all workers regardless of house group. This gives every worker full transparency into what was recorded on the field by their supervisor, eliminating disputes over hours.

Rannikon board: real-time farm display system

The screenshot shows the 'Rannikon Puutarha BOARD' interface. The header includes the logo, name, and a subtitle 'Live batches recorded by every supervisor, all houses together.' The top right corner displays the time '21:30:04' and the date 'Monday, 31 August 2026'. The main content area lists five house groups, each with a color-coded header, the number of workers, and a list of worker IDs. The data is as follows:

- Kivilinna/Salo** (4 workers): #112, #121, #143, #187
- Karton Cambodia** (4 workers): #234, #245, #265, #276
- Karton International** (4 workers): #334, #357, #378, #387
- Vassila** (4 workers): #434, #456, #467, #487
- Suppala** (4 workers): #521, #534, #567, #574

Real-time worklog display for house group televisions

Rannikon Puutarha is installing televisions in each house group building. These screens sync directly with the supervisor recording system in real time. As supervisors record

worker arrivals, batches, and finish times on the field, the information appears live on the television screens in each house.

At weekends, the weekly worklogs are displayed on the house televisions. Workers can walk up to the screen and see their recorded hours, start times, finish times, and total hours for the week without needing to open the app.

This feature eliminates the need for housemasters to manually post worklogs to Facebook groups every day. The information reaches workers automatically through the screens installed in their living spaces.

06 · The Technical Stack

- Frontend: `Next.js 16` , `React` , `jsPDF` , `jspdf-autotable` , `xlsx` , DM Sans font
- Backend: `Fastify 5` , `PostgreSQL` , JWT authentication, Google OAuth
- Database: Supabase EU West (Ireland)
- Email: Resend (`noreply@rannikon.com`)
- Mobile: `React Native` (Expo SDK 54), `expo-print` , `expo-sharing` , `expo-secure-store`
- Hosting: Render (web service + static site)
- Languages: English, Ukrainian, Khmer (Cambodia), Vietnamese, Nepali
- Version control: GitHub (`github.com/victorabuchi/rannikon`)

Key technical decisions

- Calculation engine lives entirely on the backend: no duplicate logic on the frontend
- Dates stored as noon UTC to avoid timezone off-by-one errors in Finland (UTC+3)
- JWT tokens with 30-day expiry stored in `localStorage`
- CORS configured explicitly to allow the `DELETE` method
- Green paper entries live in a separate table (`green_paper_entries`) from field work entries (`timesheet_entries`)
- Smart time input parsing: accepts `10:00` , `10.00` , `10,00` , and `1000` formats

07 · The Impact

- 300+ active workers using the system across 6 house groups
- 5 languages supported: workers use the app in their native language
- Zero manual calculation errors: the engine handles all math automatically
- Supervisors save hours daily: batch recording replaces manual notebooks
- Payroll verification reduced from days to minutes
- Lina Rannikko (farm manager) officially approved and endorsed the system
- Published on Google Play Store
- Farm manager connected Victor with other companies for potential projects

08 · What I Learned

1. Talk to real users first

The calculation formula changed multiple times based on feedback from actual farm workers and payroll staff. Getting it right required understanding the physical paper forms workers had been using for years.

2. Keep calculation logic in one place

A major bug occurred early on because the frontend had its own copy of the calculation formula that diverged from the backend. Always have one source of truth.

3. Build for the real context

Workers use the app in fields with poor connectivity, on cheap Android phones, in languages other than English. Every design decision had to account for this.

4. Start simple, add complexity gradually

The system started as a basic timesheet calculator. Supervisor batch recording, payroll verification, and the berry picking green paper were all added based on direct requests from stakeholders.

5. Personal relationships matter in business

The project moved forward because of face-to-face meetings with Lina, Aleksi, and Johanna, not just emails or messages.

09 · Tech Links

- Live app: rannikon.com
- GitHub: github.com/victorabuchi/rannikon
- Mobile (GitHub): github.com/victorabuchi/rannikon-mobile

Are you looking for a developer who can build
real solutions for real problems?

contact@victorabuchi.com