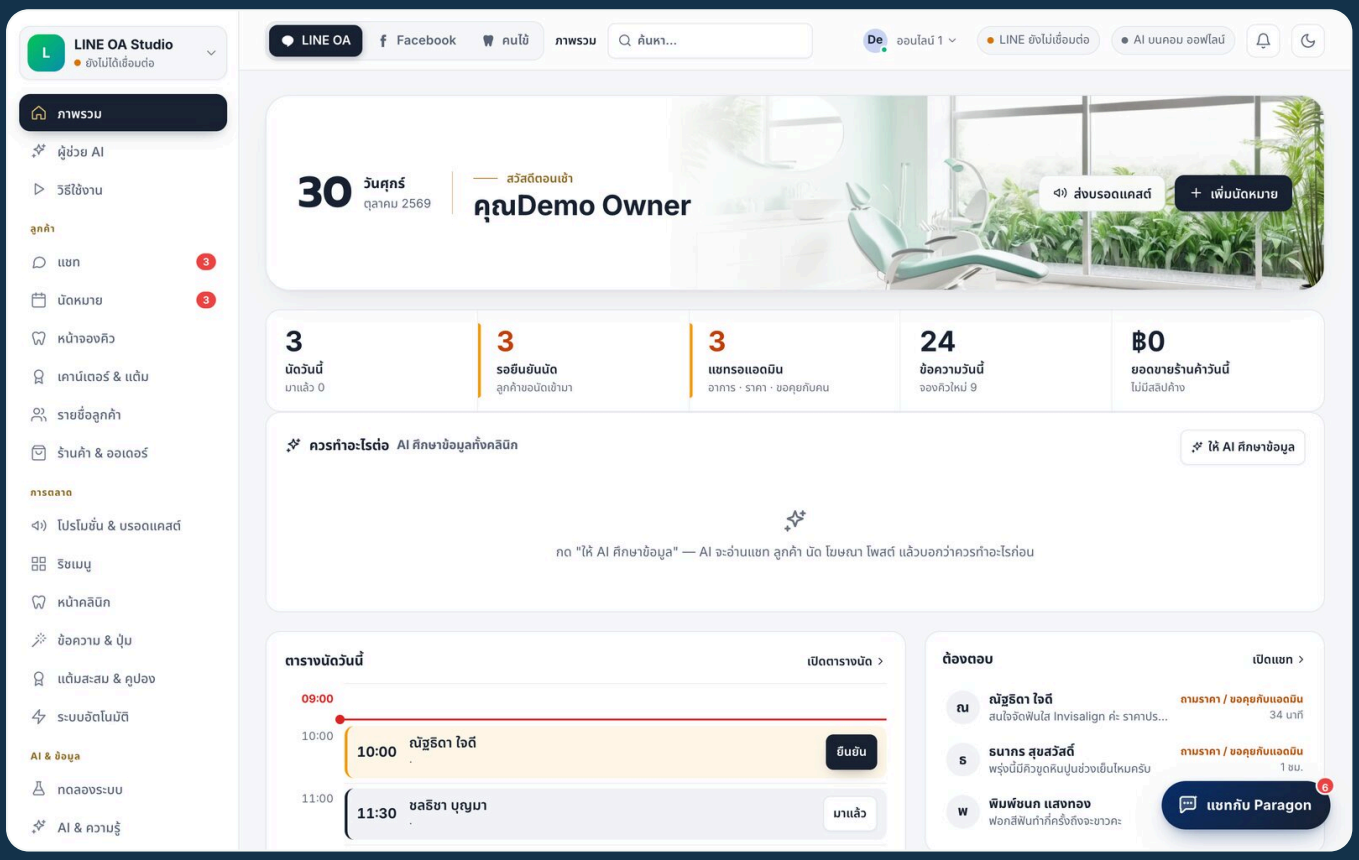
CASE STUDY · CLINIC SOFTWARE

LINE OA Studio

One web app that runs a three-branch dental clinic's customer side: every LINE and Facebook chat, bookings, patient records, the shop and marketing, with an AI assistant that answers customers and helps the staff.



3
clinic branches on one system

~27k
lines of code (front end + back end)

~260
server actions, each with a role permission

2
chat channels in one inbox: LINE and Messenger

`React 19 + Vite` `Node.js on Vercel Functions` `Postgres (Neon)` `LINE Messaging API` `Facebook Graph & Marketing API` `Gemini / Groq via AI SDK` `RAG knowledge base` `Vercel Cron & Blob`

Screens show demo data · all names are fictional

THE PROBLEM

Patients ask, book and pay through chat

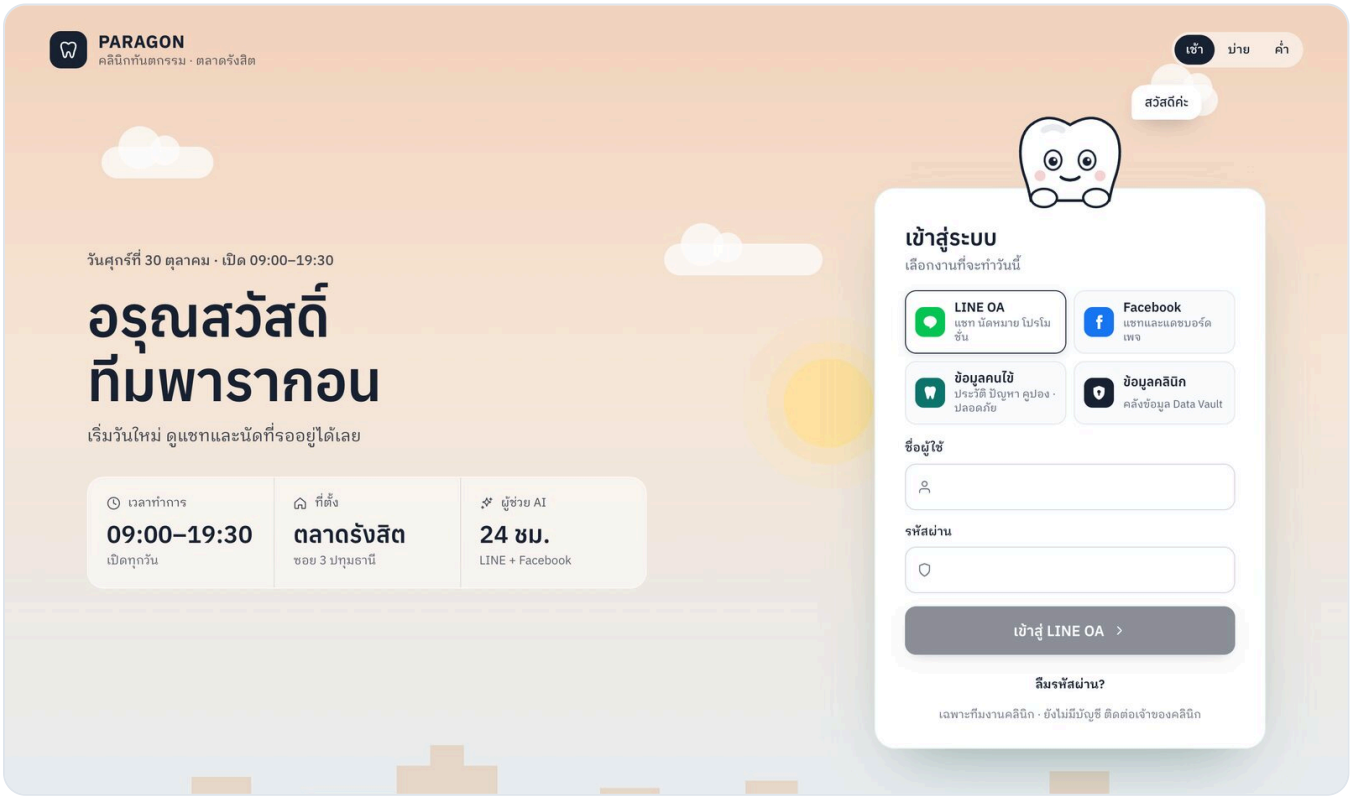
The clinic's customers reach it through LINE and Facebook Messenger: price questions, bookings, reschedules, aftercare. Answering all of that by hand, across separate apps and outside opening hours, does not scale for three branches.

What the clinic needed

- Answer customers 24/7, in Thai, with the clinic's real prices and hours
- Hand a chat to a person when it matters (pain, price, complaints)
- Bookings that turn into a dentist schedule, with reminders
- Patient data kept private, with a record of who looked at it
- Know which ads actually bring patients in

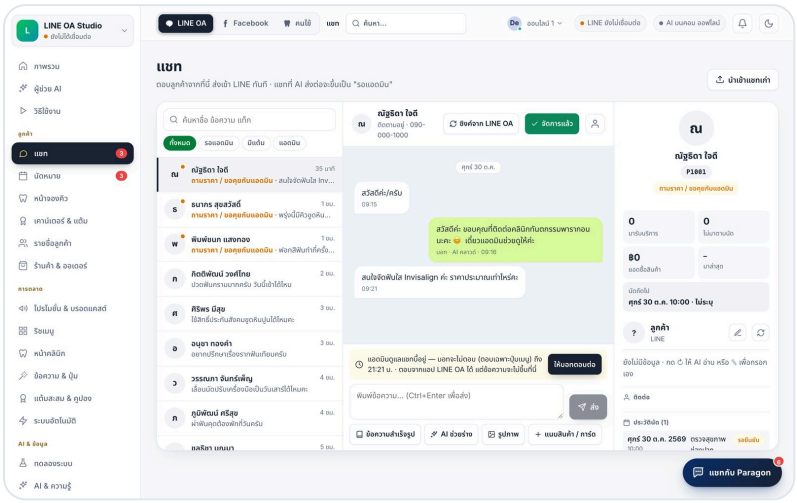
What I delivered

- A single dashboard for LINE, Facebook and patient records, switchable per branch
- An AI that replies first, using a knowledge base built from the clinic's own answers
- Booking, reminders, member cards, points, coupons and a LINE shop
- Personal logins, 2-step verification, page-level roles and an audit log
- Ad tools that track cost per chat and stop weak campaigns automatically



Sign-in page: staff choose the workspace (LINE OA, Facebook, patient records or the clinic data vault) and sign in with their own account. 2-step codes come from an authenticator app or LINE.

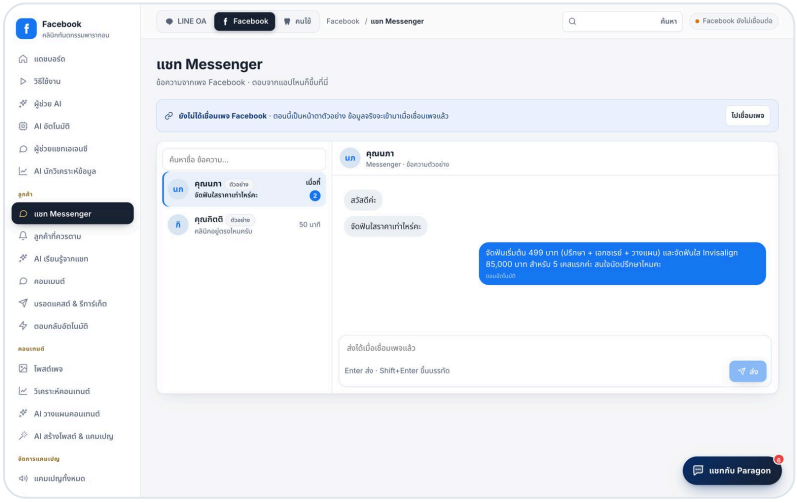
One inbox, the AI answers first



The flow

- LINE sends each message to a webhook; the signature is checked before anything is stored.
- The AI writes a reply from the clinic's knowledge base (retrieval over services, prices, promotions, hours and past staff answers).
- Price, pain and complaint questions are flagged *waiting for staff*, and each admin gets an alert on their own LINE.
- While a person is replying, the AI pauses for that customer and a resume button appears.
- The right panel shows the customer card: member number, points, next appointment, tags and notes.

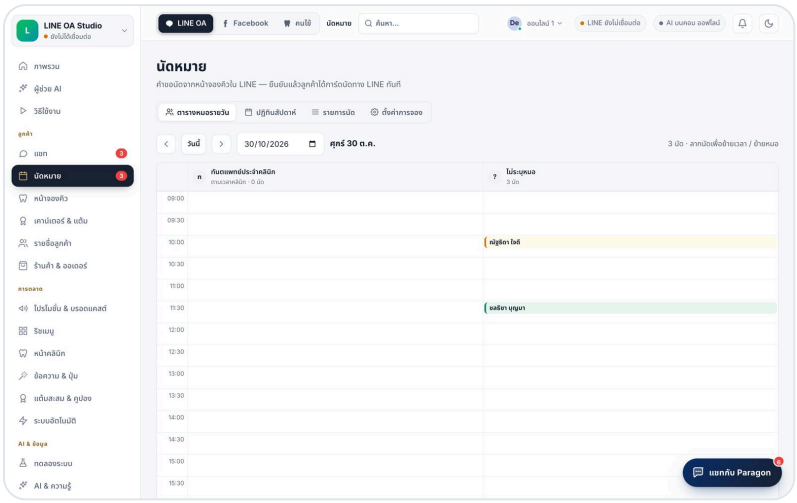
แชท LINE ทั้งหมดในที่เดียว AI ตอบก่อน และแจ้งเมื่อต้องให้คนตอบ



Facebook Messenger, same app

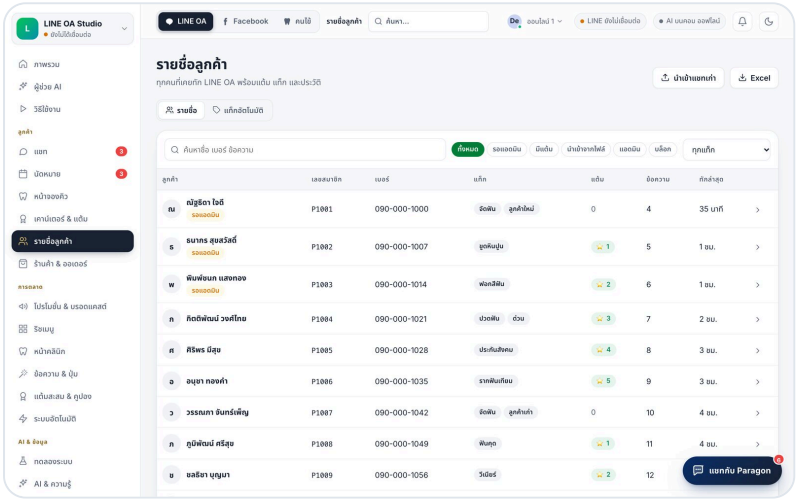
- Messenger chats sync into the app, including replies typed in Meta's own apps.
- The same person on LINE and Messenger is linked by name and phone.
- Replies record who answered: a staff member or the bot.

From a chat to a dentist's calendar



Appointments

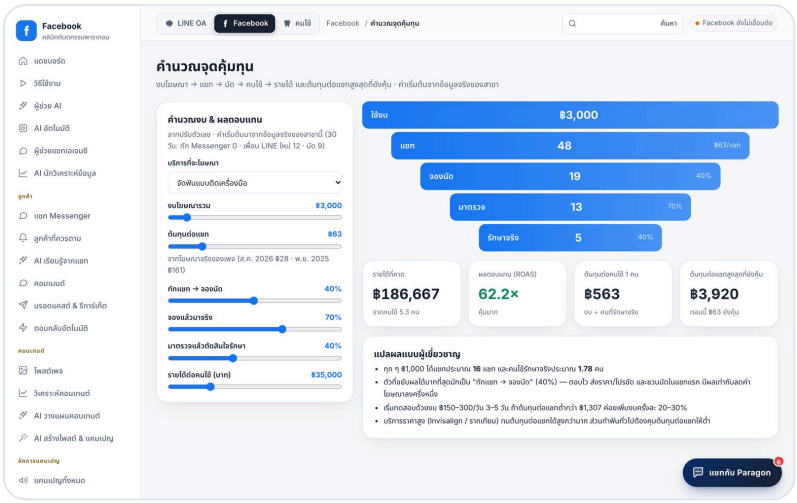
- Patients book in a page inside LINE: service, branch, dentist and free time slots.
- Day view with a column per dentist, plus week and list views; drag to reschedule, checked against days off.
- Scheduled jobs send reminders the day before, then aftercare and review requests after the visit.



Customers, loyalty and shop

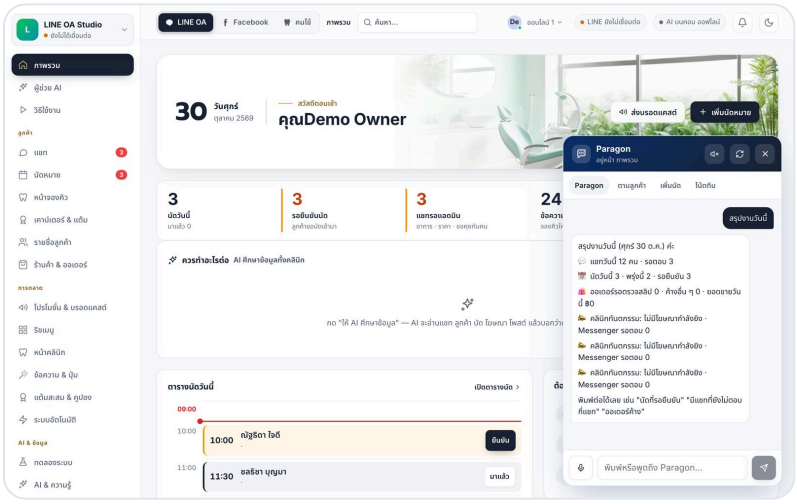
- Customer list with member numbers, tags, auto-tagging and Excel export.
- A member points card drawn as a LINE Flex Message, with a card designer.
- Shop inside LINE: products and service vouchers, PromptPay QR, bank transfer or pay at the clinic, with a two-step check of payment slips.

Ads measured in patients, not clicks



Facebook ads

- Break-even calculator: budget → chats → bookings → visits → revenue and return on ad spend.
- An ad guard watches each campaign's cost per chat and pauses it when it stops paying off (per-campaign switch).
- Daily numbers per ad are stored, so reports cover months, not just Meta's recent window.
- 30+ AI tools: post planning, captions, boosting, audience and competitor ad research.



"Paragon", the staff assistant

- Opens with a daily brief: chats waiting, appointments, orders to check, ad status per branch.
- Plain-Thai requests run as real actions: today's bookings with a confirm button, find a customer, draft a promotion.
- Common requests are handled in code; anything else is rewritten by the AI into one known command, so it can only do what staff are allowed to do.

พิมพ์ภาษาไทยธรรมดา ระบบหาและทำงานให้ตามสิทธิ์ของผู้ใช้

HOW IT IS BUILT

Architecture

PEOPLE

Customers
LINE OA chat, booking page, shop and member card inside LINE

Facebook visitors
Messenger chats, comments, ad clicks

Clinic staff
Dashboard on desktop, iPad and phone, by role

THE APP

React single-page dashboard
Three workspaces (LINE, Facebook, patients); light and dark themes; responsive down to phone

Node.js API on Vercel Functions
Webhooks with signature checks; one admin API where every action declares the role and page it needs; tests enforce it

Scheduled jobs
Reminders, follow-ups, ad checks, knowledge-base indexing, encrypted backups

SERVICES

Postgres (Neon)
One database per branch; customers, chats, bookings, orders, ad history

LINE & Meta APIs
Messaging, rich menus, Flex cards; Graph and Marketing API

AI
Gemini and Groq through the AI SDK, retrieval over the clinic's knowledge; optional local model on the clinic PC through a secure bridge

Security and privacy

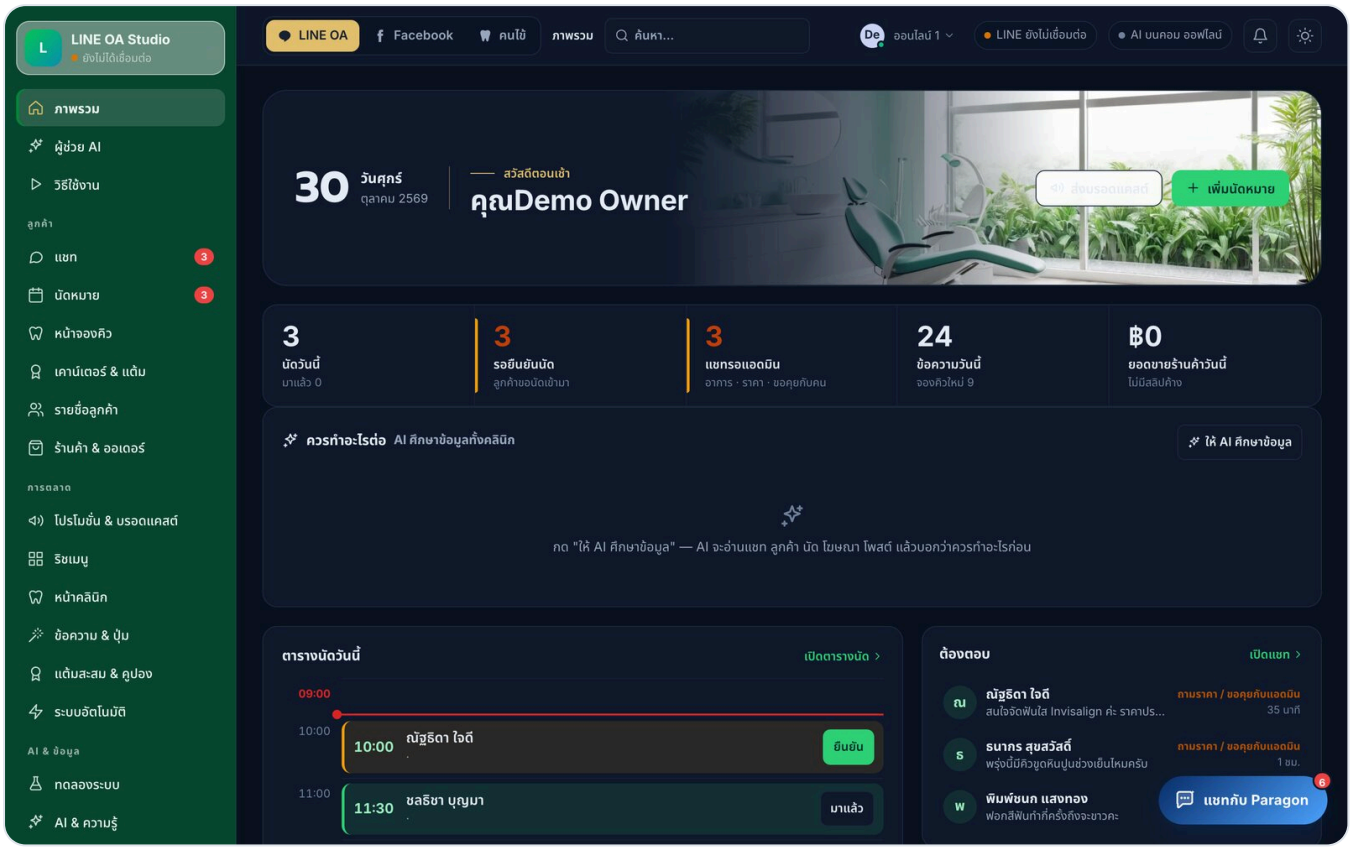
- Personal accounts, 2-step login, rate-limited sign-in, signed session cookies
- Patient records stay locked until a staff member re-enters their password; every view is logged
- Password vault stores ciphertext only; backups are encrypted
- Audit log of changes, with undo for the ones that can be reverted
- Broadcasts only to customers who gave consent

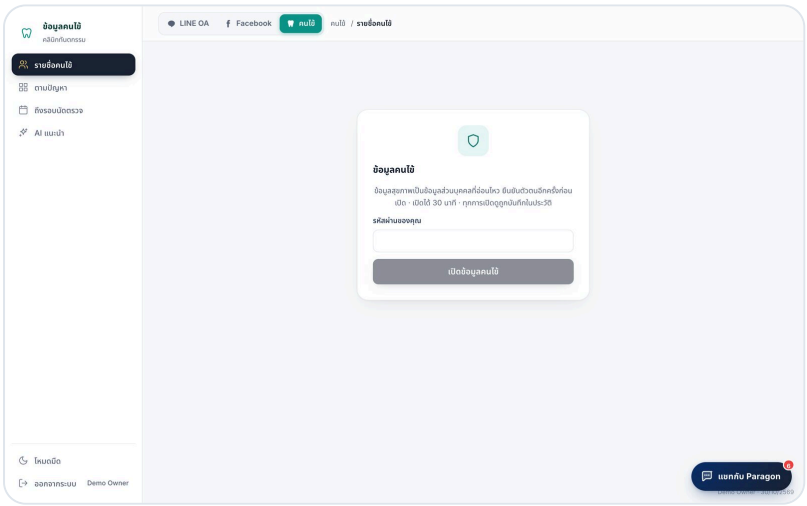
Engineering choices

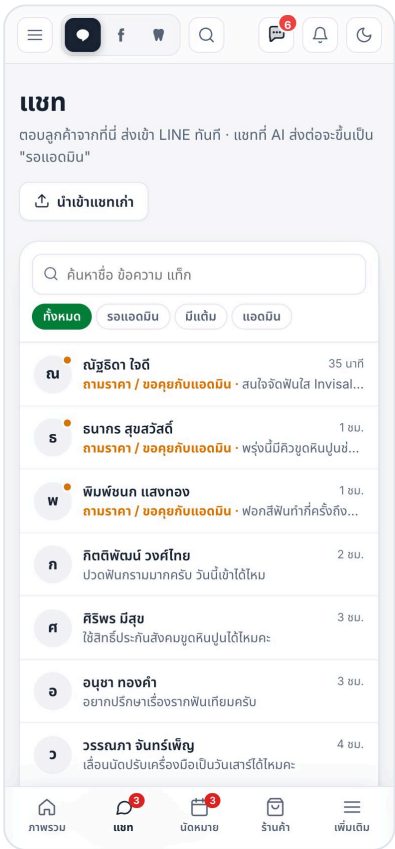
- Numbers are computed in code; the AI only explains them, so reports stay correct
- The database schema upgrades itself on deploy (versioned migrations)
- Automated tests check every server action has a permission before release
- A code map documents all modules so changes reuse existing code

EVERY SCREEN

Desktop, iPad and phone, light and dark







> Patient records workspace: locked until the staff member confirms their password, open for 30 minutes, and every opening is written to the history.

> About these screens: they come from the real application running on a separate demo database filled with invented patients and chats. No real patient data appears in this document or the video.