

Student Developer Initiative
Capstone Project

NutriTrace

a Supply Chain Transparency App

by
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Code Generations and
Optimization with IBM Granite





about me.

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Daftar Isi

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- Technologies used
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Project Overview

What is NutriTrace?

NutriTrace adalah platform pelacakan rantai pasok makanan yang memungkinkan pengguna mengetahui secara transparan asal bahan, proses pengolahan, distribusi, hingga pihak yang bertanggung jawab dalam setiap tahap produksi makanan. Selain menampilkan informasi gizi, NutriTrace juga membantu memastikan keamanan, kualitas, dan akuntabilitas pangan yang dikonsumsi oleh masyarakat.

Link:

<https://nutri-trace.vercel.app> (FE)

<https://nutri-trace-backend.bayufadayan.my.id/> (BE)



Background

Belakangan ini, kasus keracunan akibat Makanan Bergizi Gratis (MBG) menimbulkan keresahan di masyarakat dan menurunkan kepercayaan terhadap program pangan sekolah. Banyak orang tua kini ragu mengizinkan anaknya mengonsumsi makanan tersebut karena minimnya transparansi terkait asal bahan, proses produksi, dan kandungan gizi.

NutriTrace hadir sebagai solusi berbasis data untuk menghadirkan keterbukaan informasi pangan. Melalui platform ini, pengguna dapat menelusuri asal bahan mentah, proses produksi, hingga informasi nilai gizi secara menyeluruh. Dengan transparansi ini, diharapkan masyarakat dapat lebih percaya, kritis, dan aktif dalam memastikan keamanan serta kualitas pangan anak-anak di sekolah.



Goals

- Meningkatkan transparansi rantai pasok makanan bergizi gratis.
- Mengembalikan kepercayaan masyarakat terhadap program pangan sekolah.
- Membantu pemerintah dan sekolah memastikan keamanan serta kualitas makanan.
- Mendorong masyarakat agar lebih kritis dan partisipatif dalam pengawasan pangan.

Solution

- Mengembangkan platform NutriTrace untuk melacak asal bahan hingga tahap distribusi.
- Menyediakan informasi lengkap mengenai kandungan gizi dan proses pengolahan makanan.

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Technology Used

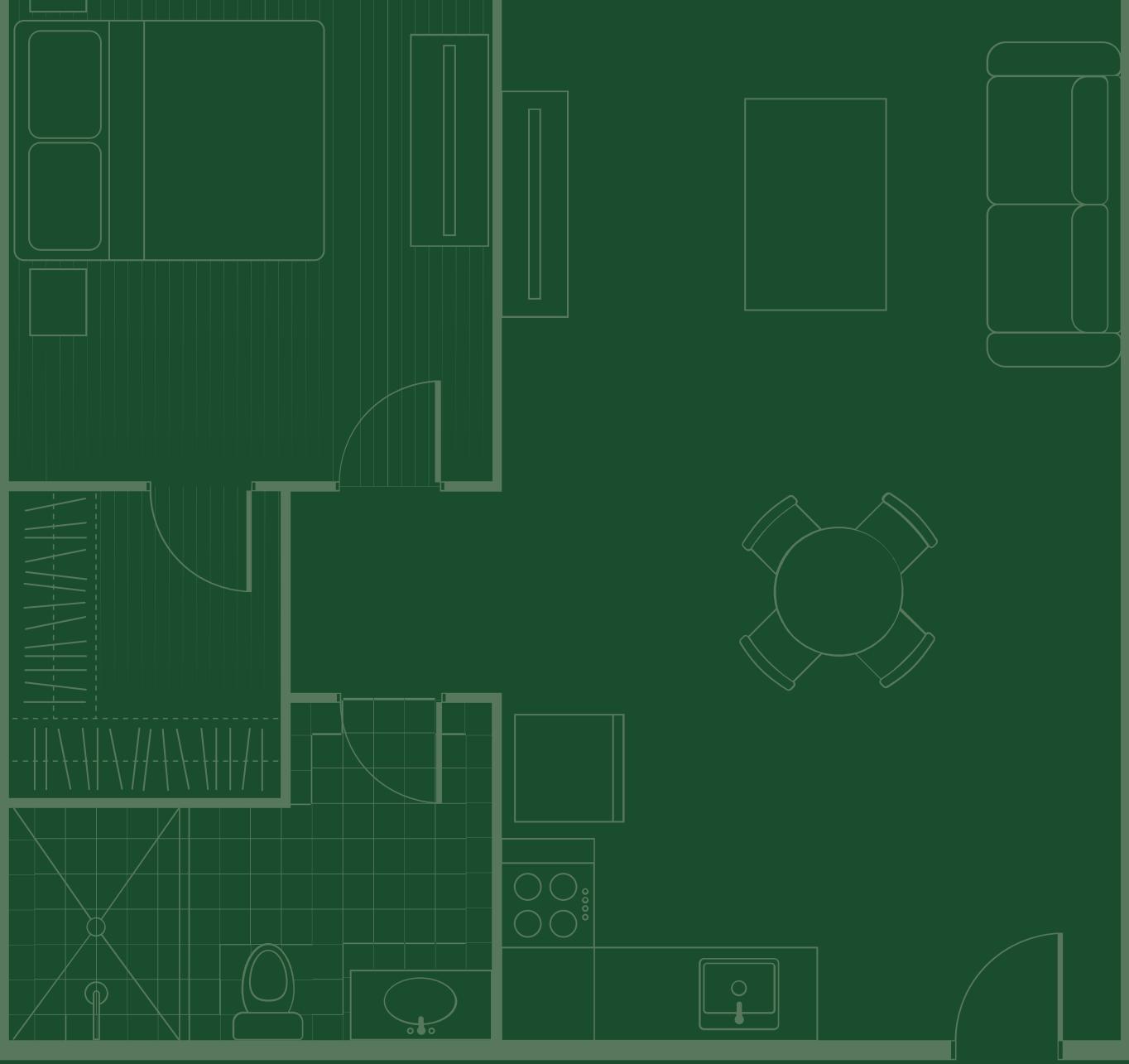
My Tech Stack

FrontEnd

- Next.js 14 (App Router) — untuk performa tinggi dan SSR yang efisien.
- TailwindCSS + ShadCN UI — memudahkan styling dengan hasil yang konsisten.
- Recharts — visualisasi data distribusi dan analisis gizi.
- React Hook Form + Zod — validasi form cepat dan aman.

Backend

- Express.js + Prisma ORM — membangun REST API yang rapi dan scalable.
- PostgreSQL — basis data relasional yang stabil dan cocok untuk data kompleks.
- JWT Authentication — manajemen hak akses berdasarkan role user.



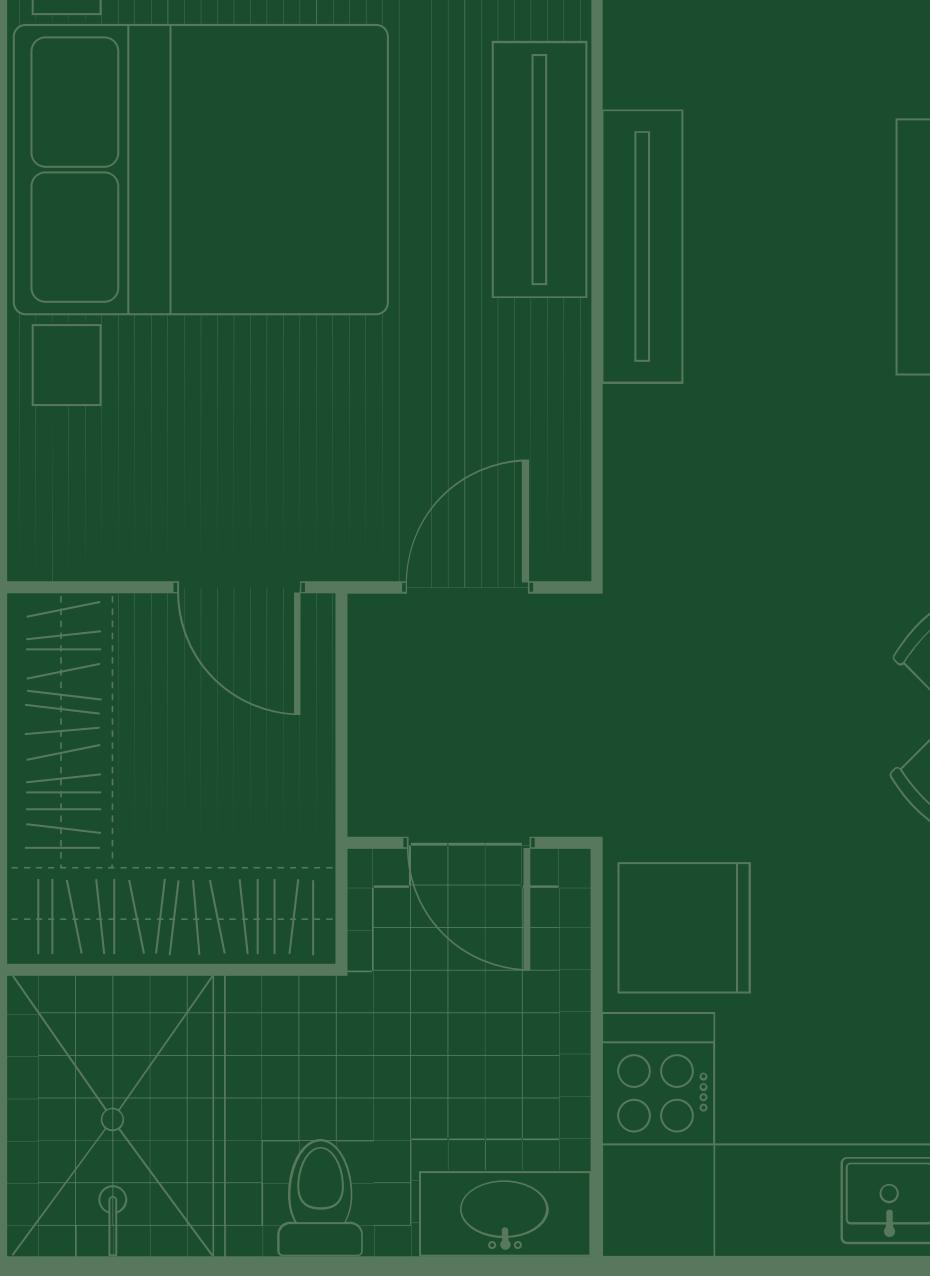
Reason

Backend (Express.js)

Express.js dipilih karena proses setup proyek yang cepat dan sederhana, sangat cocok untuk menghadapi tenggat waktu yang ketat. Framework ini juga memudahkan integrasi dengan frontend melalui API, serta memiliki proses deployment yang ringan tanpa banyak konfigurasi tambahan. Selain itu, banyak layanan hosting sudah mendukung Node.js, sehingga implementasi menjadi lebih mudah dan fleksibel.

Frontend (Next.js)

Next.js digunakan karena kemampuannya dalam membangun antarmuka pengguna dengan cepat berkat dukungan Tailwind CSS dan Shadcn UI. Framework ini juga menawarkan performa tinggi, rendering yang efisien, serta kemudahan dalam deployment menggunakan Vercel. Kombinasi tersebut membuat pengembangan UI menjadi lebih produktif, responsif, dan profesional.



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Features

— Features



Role Management System

- Mengembangkan platform NutriTrace untuk melacak asal bahan hingga tahap distribusi.
- Menyediakan informasi lengkap mengenai kandungan gizi dan proses pengolahan makanan.



Food Traceability

- Melacak asal bahan, supplier, dan jalur distribusi hingga konsumen.
- Dilengkapi kode batch & QR unik untuk setiap produk.



Nutrition Analysis

Menampilkan kandungan gizi tiap produk (protein, karbo, lemak, kalori).



QR Code Tracking

Pengguna cukup scan QR untuk melihat seluruh data produk dan nilai gizinya.

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AI Support Explanation

IBM Granite 3.3:2b via Ollama

Membuat CRUD Code

A screenshot of an AI chat interface. The user has provided a Prisma schema snippet:

```
model Product { id String @id @default(uuid()) name String qrCode String? status ProductStatus @default(PENDING) createdAt DateTime @default(now()) userId String? chefName String? user User? @relation("NutritionistProducts", fields: [userId], references: [id]) nutrition Nutrition? batches ProductBatch[] // many-to-many aiExplanations AIAgentExplanation[] }
```

The AI responds with a message: "Please edit the schema based on my current request because the column doesn't sync". Below this, it provides instructions to align the JSON structure with Prisma's model:

1. **Product ID is a UUID:** The `id` field in the `Product` model should be an `@id` and of type `String`, as per your request (UUID). This matches your JSON where "name" is also a string, implying no fixed ID.
2. **Many-to-Many Relationships:** Prisma's schema already correctly reflects the many-to-many relationship between `Product` and `Batch` using `@relation("NutritionistProducts", fields: [userId], references: [id])`. This indicates a join table or intermediary model handling this association.
3. **Associations:** Ensure your `Product` model correctly associates with the `Nutrition`.

At the bottom, there is a message input field and a "Send a message" button.

Membuat skema database

A screenshot of an AI chat interface. The user has provided a Prisma configuration snippet:

```
datasource db { provider = "postgresql" url = env("DATABASE_URL") }

generator client {
  prefix: "prisma"
}

enum Role {
  ADMIN
  SUPPLIER
  DISTRIBUTOR
  CONSUMER
}

model User {
  id Int @id @default(autoincrement())
  createdAt DateTime @default(now())
  role Role @default(SUPPLIER)
  name String
}
```

The AI responds with a message: "Send a message". At the bottom, there is a message input field and a "Send a message" button.

Solving Error

A screenshot of an AI chat interface. The user has provided a Prisma migration log:

```
variables loaded from .env
Prisma schema loaded from prisma/schema.prisma
Datasource "db": PostgreSQL
database "bayufada_nutri_trace", schema "public" at "localhost:5432"
4 migrations found in prisma/migrations
Error: P3005 The database schema is not empty. Read more about how to baseline an existing production database: https://pris.ly/d/migrate-baseline [nutri-trace-backend (24)] [bayufada@vittoria nutri-trace-backend]$
```

The AI responds with a message: "The error `P3005` is indicating that your Prisma migration tool detected that the database schema already contains data, and it's unable to perform a clean deployment because it doesn't know what state the existing data should be in. Prisma expects a "baseline" or initial schema for every new environment, especially when running `deploy`". To resolve this issue, you have two options:

1. **Remove Existing Data:** You can drop your database tables and re-run `npx prisma migrate deploy` after configuring an initial setup (i.e., generating a migration that creates all the Prisma models' tables). This ensures a clean slate for Prisma's schema management. However, be cautious as this will permanently delete existing data if you didn't back it up.
2. **Create a Migration:** You can create a custom Prisma migration (`.prisma/migrations/<new_version>.prisma`) that adds the necessary tables for your models

At the bottom, there is a message input field and a "Send a message" button.

A screenshot of an AI chat interface. The user has provided a Prisma delete log:

```
<br>&nbsp;&nbsp;async Module.deleteProduct<br>(file:///C/Users/sield/Documents/@temp/NutriTrace/nutri-trace-app-backend/src/services/productService.js:69:12)<br>&nbsp;&nbsp;async deleteProduct<br>(file:///C/Users/sield/Documents/@temp/NutriTrace/nutri-trace-app-backend/src/controllers/productController.js:28:5)</pre></body> </html>
```

The AI responds with a message: "Error while I'm deleting product, can you suggest the problem is and then try to solve". Below this, it provides a "Problem Analysis:" section:

The error `PrismaClientKnownRequestError: Invalid prisma.product.delete() invocation:

 combined with Foreign key constraint violated on the constraint: ProductBatch_productId_fkey` indicates that you're trying to delete a product that has related batches, and Prisma is encountering a foreign key constraint violation due to this relationship.

Problem Analysis:

1. **Deletable Constraint:** Your schema defines a `Product` model with a one-to-many relationship with the `Batch` model (using `@relation(fields: [productId], references: [id])`). This means each product can have multiple batches, and deleting a product should also cascade to

At the bottom, there is a message input field and a "Send a message" button.

Lebih lengkap dapat lihat di:

<https://drive.google.com/drive/folders/1otM2QtGHR8jDnluKCaphZTZsuhg5tpsp?usp=sharing>

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Output and Demo



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Sayur Pakcoy Enak

NEED APPROVAL

Chef: Chef Jua Created: 10/6/2025, 5:58:29 PM ID: e76a57aa-1454-4646-9bdc-3e13ceb0b31f



Nutrition

Calories
30 kcal

Protein
10 g

Fat
0 g

Carbs
10 g

Vitamins
Vitamin B

Related Batches

Tidak ada batch terkait.

Demo

Lebih lengkap dapat lihat di:

<https://drive.google.com/drive/folders/1otM2QtGHR8jDnlukCapHZTZsuhg5tpsp?usp=sharing>

The first screenshot shows a GET request to `((base_url_nutritrace))/batches/` returning a list of batches with fields like id, producerId, materialName, weight, createdAt, qrCode, and status.

The second screenshot shows a GET request to `((base_url_nutritrace))/users` returning a list of users with fields like id, name, email, password, role, profileImage, and refreshToken.

The third screenshot shows a POST request to `((public_nutri_trace))/login` with a JSON body containing email and password, returning a 200 OK response with user data.

The left screenshot shows the NutriTrace mobile app with a QR code scanner and manual input fields for code and trace.

The middle screenshot shows the NutriTrace web interface for a specific entry, displaying details like name (Sayur Pakcoy Enak), nutrition facts (Calories 30 kcal, Protein 10 g, Fat 0 g, Carbs 10 g, Vitamins Vitamin B), and related batches.

The right screenshot shows the NutriTrace web admin interface for users, listing users with columns for Name, Email, Role, Created, and Actions.

Screenshot

Lebih lengkap dapat lihat di:

<https://drive.google.com/drive/folders/1otM2QtGHR8jDnluKCaphZTzsuhg5tpsp?usp=sharing>

Kumpulan Link

Github

- Frontend
<https://github.com/bayufadayan/nutri-trace-app-frontend/>
- Backend
<http://github.com/bayufadayan/nutri-trace-app-backend/>

Website

- Frontend
<https://nutri-trace.vercel.app/>
- Backend
<https://nutri-trace-backend.bayufadayan.my.id/>

Drive

<https://drive.google.com/drive/folders/1otM2QtGHR8jDnluKCaphZTZsuhg5tpsp?usp=sharing>

Thank You
