

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

- Project Overview
- Technologies used
- Features
- AI support explanation
- Output and Demo



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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

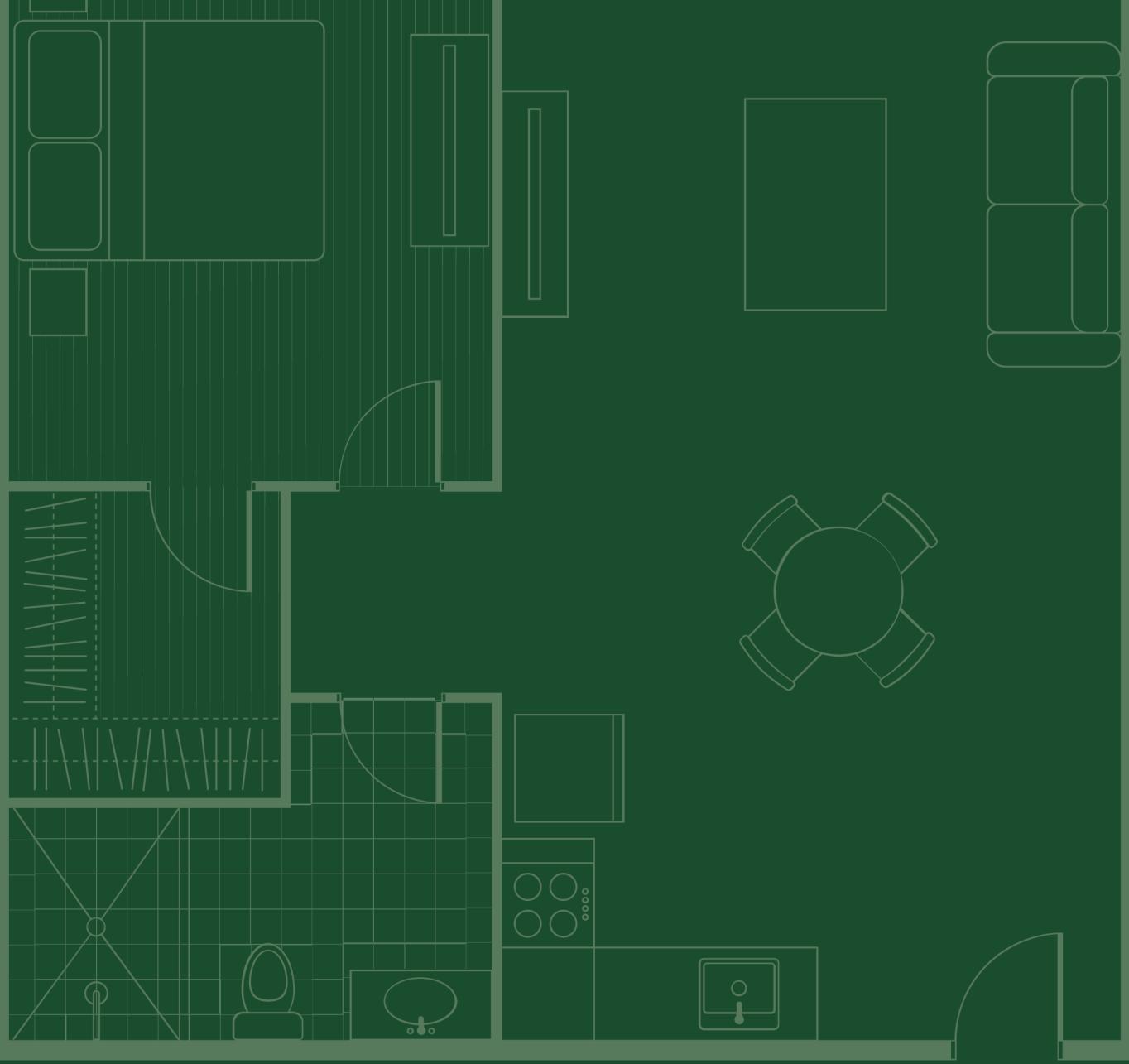
My Tech Stack

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.



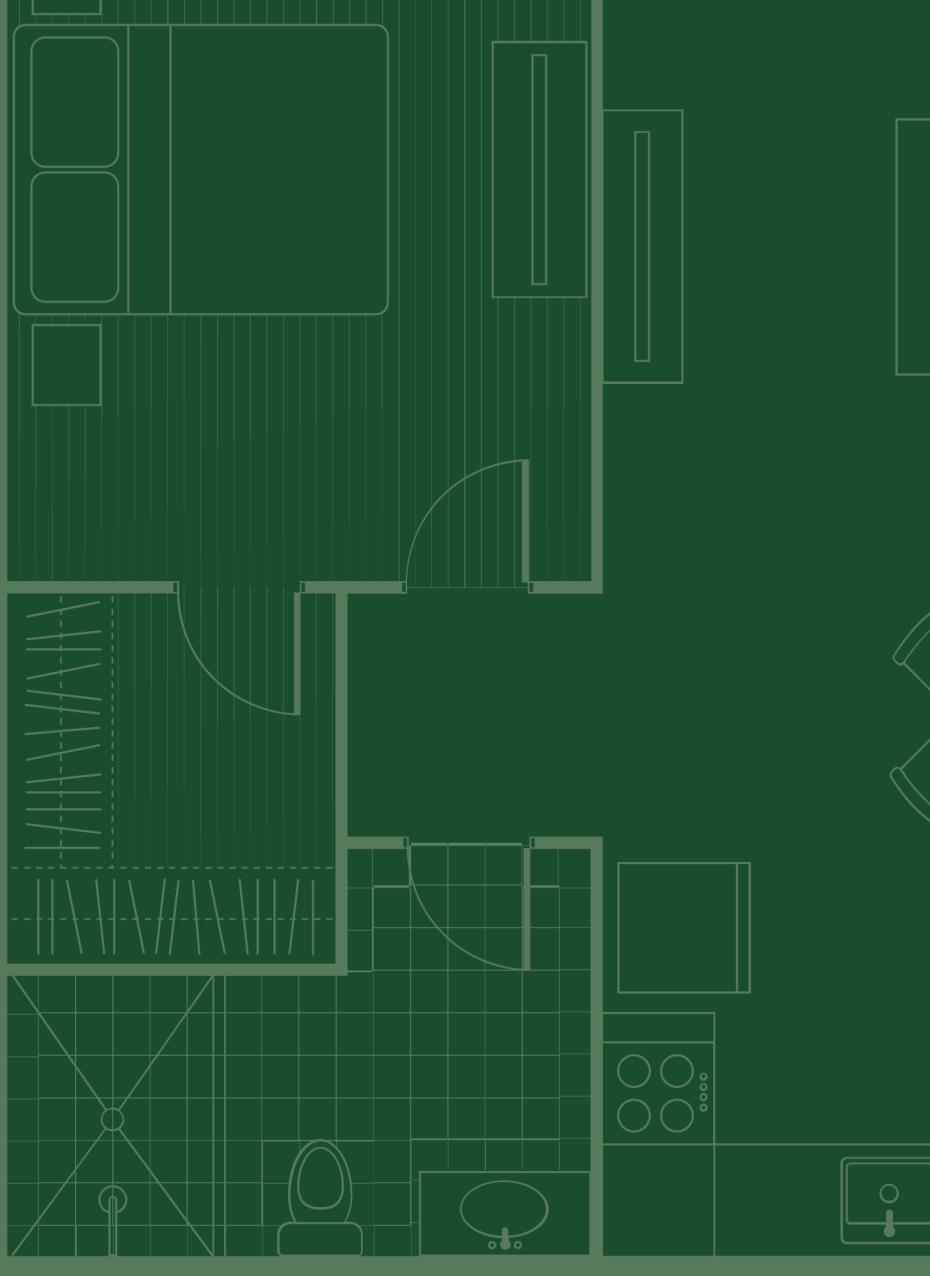
Reason

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

```
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[] }
```

Please edit the schema based on my current request because the column doesn't sync

To align your JSON structure with Prisma's model, you'll need to ensure that:

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`.

Send a message

Membuat skema database

```
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
}
```

Send a message

Solving Error

The error `P3805` 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

Send a message

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

Send a message

Lebih lengkap dapat lihat di:

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

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05

Output and Demo

< > ⌂ localhost:3000

YouTube ChatGPT WhatsApp Web Tampung First Window ChatGPT Google Gemini All Bookmarks

NutriTrace

Scan to trace nutrition & journey

Scan QR Code

Demo

Manual Input

Enter code

Trace

Admin? Go to Login

Lebih lengkap dapat lihat di:

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

The three screenshots show the following API endpoints:

- Batch / get_all_batch**: A GET request to `((base_url_nutritrace))/batches/`. Response body (JSON):

```

1 [
2   [
3     {
4       "id": "17b06e44-f860-4591-b334-b14deaha046a",
5       "producerId": "91f4b00c-026f-4c5d-829f-6b737d00ab9d",
6       "materialName": "Beras",
7       "weight": 100,
8       "createdAt": "2025-10-06T00:36:22.071Z",
9       "qrCode": "/qrcodes/17b06e44-f860-4591-b334-b14deaha046a.png",
10      "status": "PENDING"
11    },
12    [
13      {
14        "id": "a34335c8-cfa7-4284-9a66-e065466bab6",
15        "producerId": "91f4b00c-026f-4c5d-829f-6b737d00ab9d",
16        "materialName": "Jagung",
17        "weight": 100,
18        "createdAt": "2025-10-06T00:36:41.077Z",
19        "qrCode": "/qrcodes/43435c8-cfa7-4284-9a66-e065466bab6.png",
20        "status": "PENDING"
21      }
22    ]
23  ]
24]

```

- User / get_all_user**: A GET request to `((base_url_nutritrace))/users`. Response body (JSON):

```

1 [
2   [
3     {
4       "id": "91f4b00c-026f-4c5d-829f-6b737d00ab9d",
5       "name": "ADMIN 1",
6       "email": "admin@nutritrace.com",
7       "password": "$2b$10$ElP.6MEETn5v.IgiP0xD03qo1q1o10h04SapIG0hapvJokT2F2",
8       "role": "SUPERADMIN",
9       "profileImage": null,
10      "createdAt": "2025-10-06T00:36:31.283Z",
11      "refreshToken": "eyJhbGciOiJIUzI1NiIsInRcCI6IkpXVCJ9.eyJzdWIiOiJTVVBPUkFETUlOiiwiMF0ijoxNzUSNjgXNjEzLCleHA10JE3NjAyODY0MTN9.CimkbIU4aQv_5281TMem-1guIPqoDG1ZyG8uJc0E8"
12    }
13  ]
14]

```

- Auth / login**: A POST request to `((public_nutri_trace))/login`. Request body (JSON):

```

1 {
2   "email": "admin@nutritrace.com",
3   "password": "123456"
4 }

```

The three screenshots show the following application interfaces:

- NutriTrace**: A QR code scanner interface with a manual input field for entering a code.
- Product: Nasi Ayam Rica-Rica**: Product details for ID P001. Status: READY_FOR_DISTRIBUTION. Calories: 450 kcal, Fat: 10 g, Vitamins: A, C. Protein: 22 g, Carbs: 60 g. Batches: B041, B092.
- Login**: A login form with fields for Email and Password, and a Masuk button.

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
