

DOKUMENTASI UML SIM4LON

Sistem Informasi Manajemen LPG 4 Jalur Online

Versi Terbaru - Desember 2024

DAFTAR ISI

1. Pendahuluan
2. Use Case Diagram
3. Class Diagram
4. ERD (Entity Relationship Diagram)
5. Activity Diagram
6. Sequence Diagram
7. State Machine Diagram
8. Deployment Diagram

1. PENDAHULUAN

1.1 Gambaran Umum Sistem

SIM4LON (Sistem Informasi Manajemen LPG 4 Jalur Online) adalah aplikasi berbasis web untuk mengelola distribusi gas LPG dari Agen ke Pangkalan hingga ke Konsumen akhir.

1.2 Tujuan Sistem

1. Mendigitalisasi pencatatan pesanan LPG
2. Memantau stok secara real-time
3. Mencatat pembayaran dengan rapi
4. Menyediakan laporan yang akurat dan cepat
5. Mendukung multi-tenant (setiap pangkalan hanya akses data miliknya)

1.3 Full Stack Technology

| Layer | Teknologi |
|----------|---|
| Frontend | React 18, Vite 5, TanStack Query, Tailwind CSS, Shadcn/UI |
| Backend | NestJS 10, Prisma ORM, JWT, Passport |
| Database | PostgreSQL 15 |
| Storage | Supabase Storage |
| Hosting | Vercel (Frontend), Railway (Backend + Database) |

1.4 Statistik Diagram UML

| Jenis Diagram | Jumlah |
|-----------------------|-------------------------|
| Use Case Diagram | 1 (18 use cases) |
| Class Diagram | 1 (22 classes, 7 enums) |
| ERD | 1 (23 tabel) |
| Activity Diagram | 25 |
| Sequence Diagram | 18 |
| State Machine Diagram | 2 |
| Deployment Diagram | 1 |
| TOTAL | 49 Diagram |

2. USE CASE DIAGRAM

2.1 Aktor

Sistem memiliki **3 aktor utama**:

| No | Aktor | Deskripsi | Hak Akses |
|----|------------------|---------------------------------|---|
| 1 | Admin | Administrator sistem | Full access ke semua fitur termasuk master data |
| 2 | Operator | Staff operasional agen | Akses operasional: pesanan, stok, pembayaran |
| 3 | Pangkalan | Pemilik/pengelola pangkalan LPG | Hanya akses data milik sendiri |

2.2 Daftar Use Case (18 Use Case)

Use Case Semua Aktor

| No | Use Case | Deskripsi |
|----|---------------|---------------------------------------|
| 1 | Login | Masuk ke sistem dengan single-session |
| 2 | Kelola Profil | Melihat dan mengubah data profil |

Use Case Admin Only

| No | Use Case | Deskripsi |
|----|------------------|---------------------|
| 3 | Kelola Pengguna | CRUD data pengguna |
| 4 | Kelola Pangkalan | CRUD data pangkalan |
| 5 | Kelola Supir | CRUD data driver |

| No | Use Case | Deskripsi |
|----|---------------------|-----------------------------|
| 6 | Lihat Log Aktivitas | Monitoring aktivitas sistem |
| 7 | Kelola Perencanaan | Perencanaan alokasi LPG |

Use Case Admin + Operator

| No | Use Case | Deskripsi |
|----|-------------------|----------------------------|
| 8 | Kelola Dashboard | Ringkasan KPI |
| 9 | Kelola Pesanan | Mengelola pesanan LPG |
| 10 | Update Status | Mengubah status pesanan |
| 11 | Assign Driver | Menugaskan driver (extend) |
| 12 | Kelola Pembayaran | Mencatat pembayaran |
| 13 | Cetak Nota | Mencetak invoice (extend) |
| 14 | Kelola Stok | Mengelola stok LPG |
| 15 | Kelola Laporan | Melihat laporan |

Use Case Pangkalan Only

| No | Use Case | Deskripsi |
|----|--------------------|--------------------------------|
| 16 | Kelola Penjualan | Mencatat penjualan ke konsumen |
| 17 | Kelola Konsumen | CRUD data konsumen |
| 18 | Buat Order ke Agen | Memesan LPG dari agen |

2.3 Relasi Use Case

Include Relationship

| Use Case Utama | Include |
|----------------|-----------------|
| Kelola Pesanan | → Update Status |

Extend Relationship

| Use Case Utama | Extension Point | Extension |
|-------------------|-----------------|---------------|
| Update Status | Assign Driver | Assign Driver |
| Kelola Pembayaran | Cetak Nota | Cetak Nota |

2.4 Matriks Akses

| Use Case | Admin | Operator | Pangkalan |
|---------------------|-------|----------|-----------|
| Login | ✓ | ✓ | ✓ |
| Kelola Profil | ✓ | ✓ | ✓ |
| Kelola Pengguna | ✓ | ✗ | ✗ |
| Kelola Pangkalan | ✓ | ✗ | ✗ |
| Kelola Supir | ✓ | ✗ | ✗ |
| Lihat Log Aktivitas | ✓ | ✗ | ✗ |
| Kelola Perencanaan | ✓ | ✗ | ✗ |
| Kelola Dashboard | ✓ | ✓ | ✗ |
| Kelola Pesanan | ✓ | ✓ | ✗ |
| Update Status | ✓ | ✓ | ✗ |
| Assign Driver | ✓ | ✓ | ✗ |
| Kelola Pembayaran | ✓ | ✓ | ✗ |
| Cetak Nota | ✓ | ✓ | ✗ |
| Kelola Stok | ✓ | ✓ | ✗ |
| Kelola Laporan | ✓ | ✓ | ✗ |
| Kelola Penjualan | ✗ | ✗ | ✓ |
| Kelola Konsumen | ✗ | ✗ | ✓ |
| Buat Order ke Agen | ✗ | ✗ | ✓ |

3. CLASS DIAGRAM

3.1 Daftar Class (22 Classes)

Master Data (6 Classes)

| Class | Deskripsi |
|-----------------|----------------------|
| users | Data pengguna sistem |
| agen | Data agen LPG |
| pangkalans | Data pangkalan |
| drivers | Data supir/driver |
| lpg_products | Data produk LPG |
| company_profile | Profil perusahaan |

Order Management (4 Classes)

| Class | Deskripsi |
|-----------------|------------------------|
| orders | Data pesanan |
| order_items | Item dalam pesanan |
| timeline_tracks | Riwayat status pesanan |
| invoices | Data invoice |

Payment (2 Classes)

| Class | Deskripsi |
|-----------------------|------------------------------|
| order_payment_details | Summary pembayaran per order |
| payment_records | Riwayat pembayaran |

Stock Management (4 Classes)

| Class | Deskripsi |
|--------------------|-------------------------|
| stock_histories | Riwayat pergerakan stok |
| penerimaan_stok | Penerimaan dari SPBE |
| perencanaan_harian | Perencanaan distribusi |
| penyaluran_harian | Penyaluran ke pangkalan |

Pangkalan SAAS Module (6 Classes)

| Class | Deskripsi |
|------------------|-------------------------|
| consumers | Data konsumen pangkalan |
| consumer_orders | Penjualan ke konsumen |
| pangkalan_stocks | Stok pangkalan |
| lpg_prices | Harga jual pangkalan |
| expenses | Pengeluaran pangkalan |
| agen_orders | Order pangkalan ke agen |

3.2 Daftar Enumerations (7 Enums)

| Enum | Values |
|-------------|----------------------------|
| user_role | ADMIN, OPERATOR, PANGKALAN |

| Enum | Values |
|---------------------|---|
| status_pesanan | DRAFT, MENUNGGU PEMBAYARAN, DIPROSES, SIAP_KIRIM, DIKIRIM, SELESAI, BATAL |
| lpg_type | kg3, kg5, kg12, kg50, gr220 |
| lpg_category | SUBSIDI, NON_SUBSIDI |
| payment_method | TUNAI, TRANSFER |
| stock_movement_type | MASUK, KELUAR |
| consumer_type | RUMAH_TANGGA, WARUNG |

3.3 Relationship Types

| Jenis Relasi | Simbol | Contoh |
|--------------|--------|------------------------|
| Association | — | orders —— pangkalans |
| Aggregation | ◇— | agen ◇—— pangkalans |
| Composition | ◆— | orders ◆—— order_items |
| Dependency | ..> | users ..> user_role |

4. ERD (Entity Relationship Diagram)

4.1 Daftar Entitas (23 Tabel)

Master Data

| Tabel | PK | Deskripsi |
|-----------------|-----------|-------------------|
| users | id (UUID) | Data pengguna |
| agen | id (UUID) | Data agen |
| pangkalans | id (UUID) | Data pangkalan |
| drivers | id (UUID) | Data driver |
| lpg_products | id (UUID) | Data produk LPG |
| company_profile | id (UUID) | Profil perusahaan |

Order Management

| Tabel | PK | FK |
|-------------|----|-------------------------|
| orders | id | pangkalan_id, driver_id |
| order_items | id | order_id |

| Tabel | PK | FK |
|-----------------|----|----------|
| timeline_tracks | id | order_id |
| invoices | id | order_id |

Payment

| Tabel | PK | FK |
|-----------------------|----|---|
| order_payment_details | id | order_id |
| payment_records | id | order_id, invoice_id, recorded_by_user_id |

Stock Management

| Tabel | PK | FK |
|--------------------|----|-------------------------------------|
| stock_histories | id | lpg_product_id, recorded_by_user_id |
| penerimaan_stok | id | - |
| perencanaan_harian | id | pangkalan_id |
| penyaluran_harian | id | pangkalan_id |

Pangkalan SAAS Module

| Tabel | PK | FK |
|------------------|----|---------------------------|
| consumers | id | pangkalan_id |
| consumer_orders | id | pangkalan_id, consumer_id |
| pangkalan_stocks | id | pangkalan_id |
| lpg_prices | id | pangkalan_id |
| expenses | id | pangkalan_id |
| agen_orders | id | pangkalan_id, agen_id |

Audit

| Tabel | PK | FK |
|---------------|----|-------------------|
| activity_logs | id | user_id, order_id |

4.2 Crow's Foot Notation

| Simbol | Arti |
|--------|-----------------|
| | One (mandatory) |

| Simbol | Arti |
|---------------|--------------|
| o | Zero or One |
| { | One or Many |
| o{ | Zero or Many |

4.3 Relasi Utama

| Tabel A | Cardinality | Tabel B |
|----------------|--------------------|-----------------------|
| pangkalans | 1 : N | orders |
| orders | 1 : N | order_items |
| orders | 1 : 1 | order_payment_details |
| orders | 1 : N | timeline_tracks |
| pangkalans | 1 : N | consumers |
| pangkalans | 1 : N | consumer_orders |
| agen | 1 : N | pangkalans |

5. ACTIVITY DIAGRAM

5.1 Daftar Activity Diagram (25 Diagram)

Fase 1 - Core Business

| No | Diagram | File |
|-----------|-----------------------|--------------------------------|
| 1 | Login | AD_01_Login.puml |
| 2 | Buat Pesanan | AD_02_BuatPesanan.puml |
| 3 | Update Status | AD_03_UpdateStatus.puml |
| 4 | Catat Pembayaran | AD_04_CatatPembayaran.puml |
| 5 | Catat Penerimaan Stok | AD_05_CatatPenerimaanStok.puml |
| 6 | Catat Penyaluran | AD_06_CatatPenyaluran.puml |
| 7 | Generate Laporan | AD_07_GenerateLaporan.puml |
| 8 | Assign Driver | AD_08_AssignDriver.puml |
| 9 | Kelola Profil | AD_09_KelolaProfil.puml |

Fase 2 - Extended Features

| No | Diagram | File |
|-------|-------------------|---------------|
| 10-25 | Extended Features | AD_10 - AD_25 |

5.2 Komponen Activity Diagram

| Komponen | Simbol | Fungsi |
|--------------|--------|---------------------|
| Initial Node | ● | Titik awal |
| Final Node | ○ | Titik akhir |
| Action | □ | Aktivitas/langkah |
| Decision | ◇ | Percabangan |
| Fork/Join | ■ | Parallel execution |
| Swimlane | Kolom | Pembagian per aktor |

6. SEQUENCE DIAGRAM

6.1 Daftar Sequence Diagram (18 Diagram)

Fase 1 - Core Business

| No | Diagram | File |
|----|----------------|--------------------------|
| 1 | Login | SD_01_Login.puml |
| 2 | Validate Token | SD_02_ValidateToken.puml |
| 3 | Create Order | SD_03_CreateOrder.puml |
| 4 | Update Status | SD_04_UpdateStatus.puml |
| 5 | Assign Driver | SD_05_AssignDriver.puml |
| 6 | Record Payment | SD_06_RecordPayment.puml |
| 7 | Stock In | SD_07_StockIn.puml |
| 8 | Stock Out | SD_08_StockOut.puml |

Fase 2 - Extended Features

| No | Diagram | File |
|------|-------------------|---------------|
| 9-18 | Extended Features | SD_09 - SD_18 |

6.2 Stereotype Participant

| Stereotype | Simbol | Contoh |
|------------|--------|--------|
| | | |

| Stereotype | Symbol | Contoh |
|------------|--------|---------------------------|
| <> | >User | User, Admin |
| <> | □ | LoginPage, OrderForm |
| <> | ○ | AuthService, OrderService |
| <> | ◊ | users, orders |

6.3 Message Types

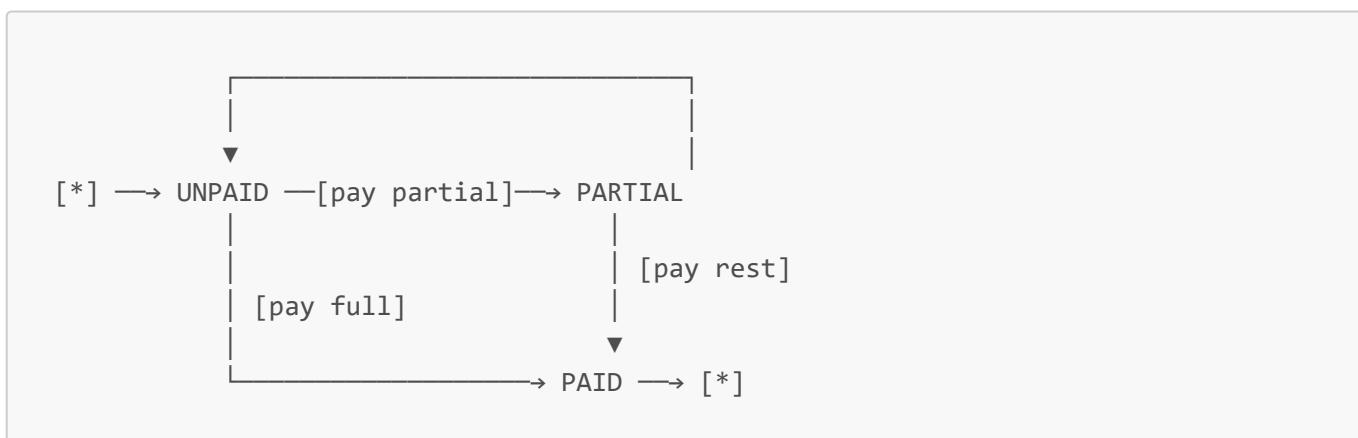
| Tipe | Symbol | Arti |
|-------------|--------|----------------------|
| Synchronous | —► | Request blocking |
| Return | - - -> | Response |
| Self-call | ↔ | Panggil diri sendiri |

7. STATE MACHINE DIAGRAM

7.1 Daftar State Machine (2 Diagram)

| No | Diagram | File | States |
|----|----------------|--------------------------|----------|
| 1 | Payment Status | SM_02_PaymentStatus.puml | 3 states |
| 2 | User Session | SM_04_UserSession.puml | 4 states |

7.2 SM-02: Payment Status

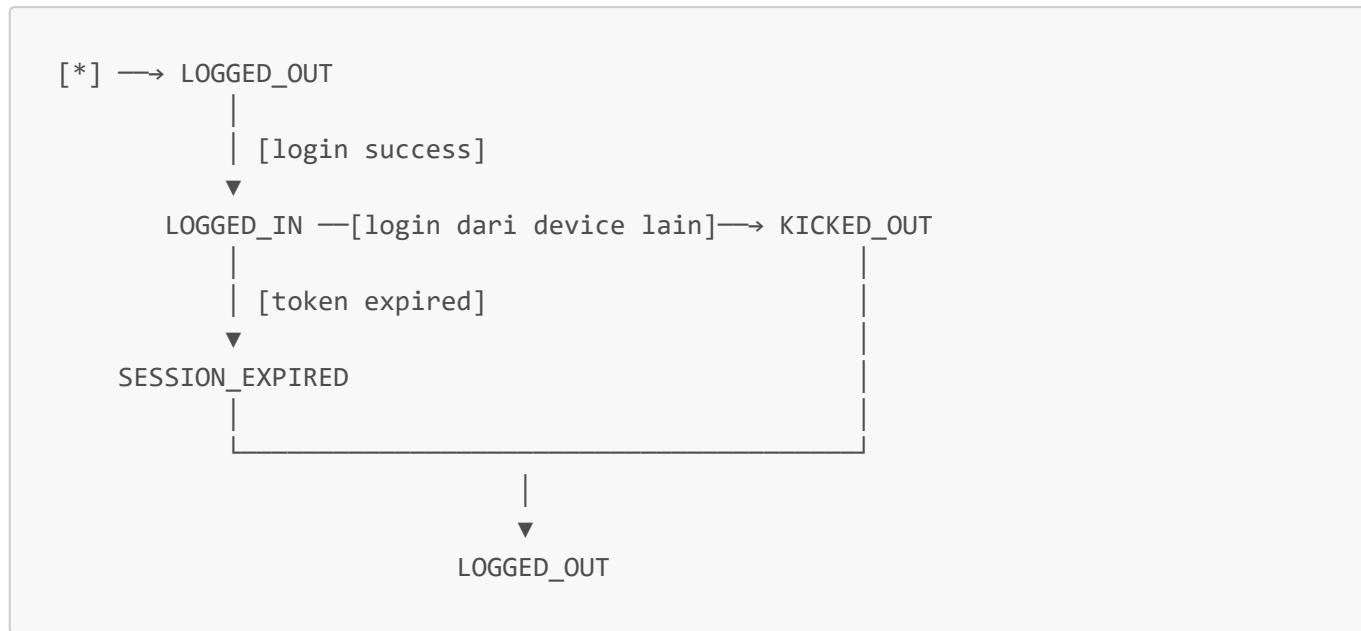


State Details

| State | is_paid | is_dp | Deskripsi |
|---------|---------|-------|-----------------------|
| UNPAID | false | false | Belum ada pembayaran |
| PARTIAL | false | true | Sudah DP, belum lunas |

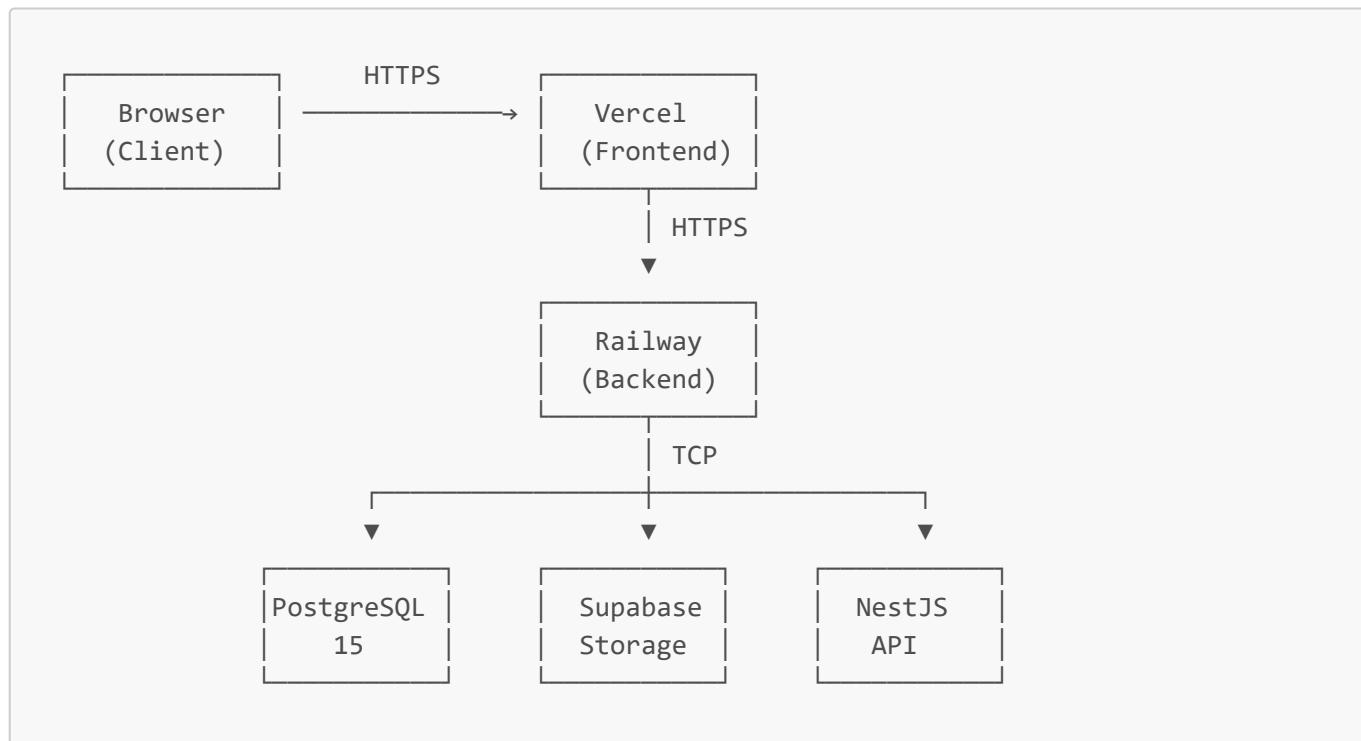
| State | is_paid | is_dp | Deskripsi |
|--------------|----------------|--------------|------------------|
| PAID | true | false | Lunas |

7.3 SM-04: User Session (Single-Session Login)



8. DEPLOYMENT DIAGRAM

8.1 Arsitektur Deployment



8.2 Komponen

| Node | Platform | Komponen |
|----------|----------------|------------------------|
| Browser | Chrome/Firefox | React 18 App |
| Vercel | Cloud | Frontend hosting, CDN |
| Railway | Cloud | NestJS 10 API |
| Railway | Cloud | PostgreSQL 15 Database |
| Supabase | Cloud | S3-compatible Storage |

8.3 Environment Variables

| Variable | Lokasi | Deskripsi |
|--------------|----------|------------------------------|
| DATABASE_URL | Backend | Connection string PostgreSQL |
| JWT_SECRET | Backend | Secret untuk JWT |
| SUPABASE_URL | Backend | Supabase endpoint |
| SUPABASE_KEY | Backend | Supabase API key |
| VITE_API_URL | Frontend | Backend API URL |

LAMPIRAN

File Diagram (PlantUML)

| Jenis | File |
|---------------|---------------------------|
| Use Case | SIM4LON_UseCase.puml |
| Class | SIM4LON_ClassDiagram.puml |
| ERD | SIM4LON_ERD.puml |
| Activity | AD_01 - AD_25.puml |
| Sequence | SD_01 - SD_18.puml |
| State Machine | SM_02, SM_04.puml |
| Deployment | SIM4LON_Deployment.puml |

Tools untuk Render

- **PlantUML Server:** <https://www.plantuml.com/plantuml>
- **VS Code Extension:** PlantUML by jebbs
- **IntelliJ Plugin:** PlantUML Integration

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