BetonStock

Case Study

Enterprise Web App for Industrial Management

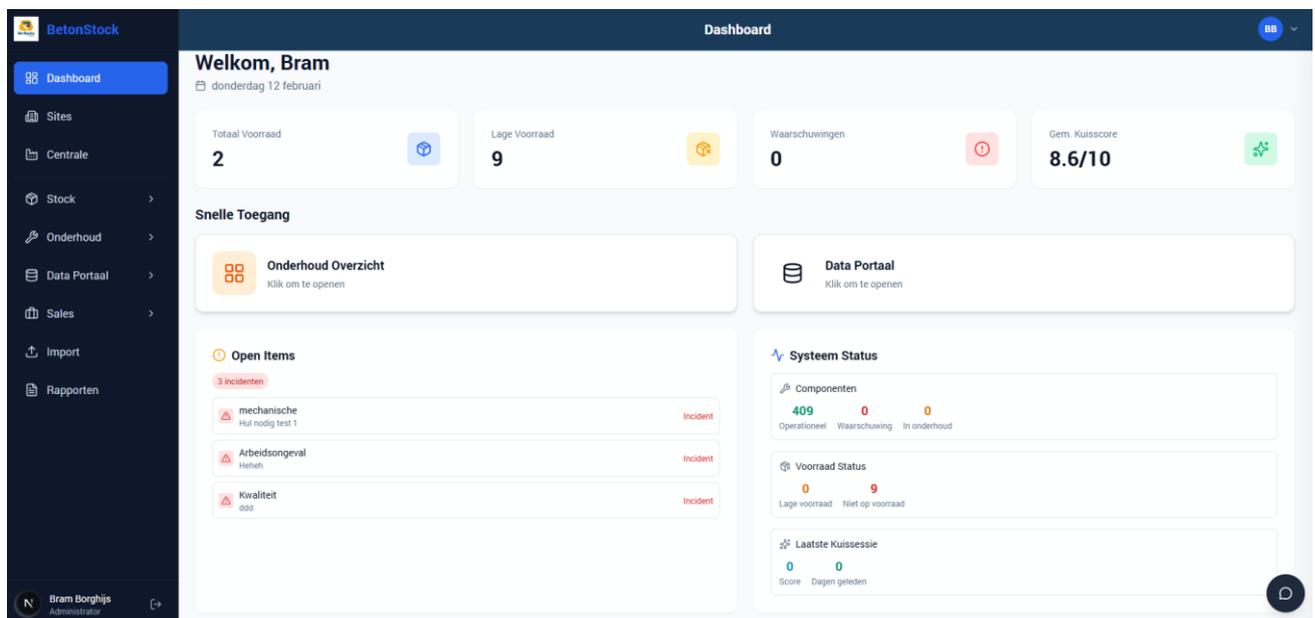**De Rycke Gebroeders nv** | Full-Stack Next.js | 6 User Roles | In Development / Beta

The Problem

De Rycke Gebroeders operates a network of concrete plants across Belgium — fixed factories (Kallo, Herdersem, Kieldrecht), mobile installations (T1–T4), and floating platforms on ships (Bonton, Contoon). Every site needs inventory tracking, maintenance planning, quality control, and incident management.

Without a central system, departments worked in silos with paper-based processes. Maintenance was reactive, visibility was lacking, and there was no measurable quality standard.

The Solution

A full-stack enterprise web application that serves as the digital nerve center of the organization. One interface connecting 6 modules — stock management, maintenance, sales CRM, data portal, reporting, and site management — with role-based access control, optimized for tablets in industrial environments.

Tech Stack

- **Framework:** Next.js 16.1 (App Router), React 19, TypeScript
- **Styling:** TailwindCSS, Glassmorphism UI
- **Database:** Supabase (PostgreSQL) — 2 separate instances (main + maintenance)
- **Auth:** Azure MSAL (Microsoft 365) + custom employee login
- **PDF Generation:** jsPDF with company branding & VAT calculation
- **Email:** Nodemailer (SMTP) — purchase orders to suppliers
- **Excel/SharePoint:** XLSX library + Microsoft Graph Client
- **AI:** Google Gemini — chatbot + report insights
- **Charts:** Recharts
- **Mobile:** Companion React Native / Expo app

Modules

Stock Management

Full inventory system for all spare parts and products with search, category filters, and location filters.

- **Shopping Mode —** Select products via checkboxes, group by supplier, create a cart and convert to purchase order
- **Order Workflow —** Created → Awaiting approval → Approved → Sent to supplier → Confirmed → Received
- **PDF Purchase Orders —** Professional documents with company branding, VAT calculation (21%), IBAN/BIC footer
- **Email Integration —** Send PDF orders directly to suppliers via Nodemailer
- **Auto Stock Update —** When marked as delivered, items are automatically added to inventory

Maintenance

Complete maintenance management with dashboard, calendar, daily reports, inspections, incidents, and cleaning tracking.

- **Dashboard & Calendar —** Weekly overview of reports, inspections, and cleaning sessions. Monthly calendar filterable by machine and plant

- **Site Components —** Component list per plant with status tracking (Operational, Warning, Maintenance, Error, Out of service). Stock-linked toggle connects components to inventory

- **Daily Reports —** Technicians log date, plant, work performed, and notes

- **Inspection Rounds —** Photo-based inspections with scoring per category (Safety, Service, Quality, Environment). Photo carousel with positions and scores (1-10)

- **Incidents (Kanban) —** Drag-and-drop board: Open → In progress → Resolved. Tracks lost work hours and lost m³ concrete per incident. Categories: Vehicles, Pneumatics, Hydraulics, Electrical, Mechanical, Piping

- **Cleaning + Gamification —** Sessions scored 1-10 with photo evidence. Leaderboard with trophies for top 3 plants. Staff compete for better scores

Sites Overview

Visual overview of all concrete plants, grouped by type with color-coded status rings.

- **Floating Plants —** Large cards with ship icon, status ring (green = active, red = under construction, orange = maintenance)
- **Mobile Plants —** Cards with gear icon, inline editable status and location
- **Fixed Sites —** Grouped by main location, compact grid with factory icon

Data Portal

Management of drivers, vehicles, customers, and documents with expiry tracking.

- **Drivers:** Document tracking (license, ADR, medical certificate) with color-coded expiry dates
- **Vehicles:** Fleet management with inspection, insurance, and document status
- **Documents:** Central overview with bulk actions (ZIP download, reminder emails)

Data Portal – Client view

Sales CRM

CRM module for the sales team with dashboard, contact management, and customer management.

- **Dashboard —** Stats, quick notes, quote search, attention points, recent activity
- **Contacts —** Meeting notes, full-text search, relationship management (birthday, partner)
- **Customers —** Companies with projects, quotes, and SharePoint integration
- **Quote Workflow —** Draft → Sent → Approved / Rejected / Expired
- **SharePoint Sync —** Drag & drop Excel projects with UPSERT strategy preserving UUIDs and foreign keys

Reports & AI

Data-driven reporting with AI support across all modules.

- **AI Free Question —** Ask a question in natural language → AI generates SQL, executes it, shows results
- **Visualization —** Chart (Recharts), table (raw data), and AI explanation (Gemini, Dutch)
- **Export —** PDF and Excel download of any report

Cross-Cutting Features

Role-Based Access Control (RBAC)

Every UI element, sidebar link, and API call is checked via 40+ granular permissions using a module.action pattern (e.g. stock.orders.approve).

Role	Access
Admin	Full access to all modules
Onderhoud	Stock + maintenance
Onderhoud Boss	Maintenance supervision + order approval
Dispatch	Data portal + reports
Kwaliteit	Maintenance + cleaning (quality control)
Sales	Sales module + quote approval

Other Highlights

- **Dual Database Architecture —** Domain isolation between operational data and field inspections
- **59 Database Migrations —** Incremental schema design with FK's, cascades, RLS policies
- **Parallel Data Fetching —** Promise.all() for up to 7 concurrent queries
- **PDF Generation —** Professional purchase orders with De Rycke branding, sent directly via email
- **Mobile App Integration —** React Native/Expo companion app for field technicians
- **AI Chatbot —** Google Gemini integrated for user support and report insights
- **Bidirectional Stock Sync —** Automatic link between maintenance components and inventory
- **SharePoint Sync —** UPSERT strategy preserving UUIDs and foreign key relations

By the Numbers

75+	40+	30+	59
React Components	Pages / Routes	Database Tables	Migrations

40+	6	6	3
Permissions	User Roles	Modules	Site Types

Built by Bram Borghijs — 2025-2026