

# BetonStock

## Case Study

Enterprise Web App for Industrial Management

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

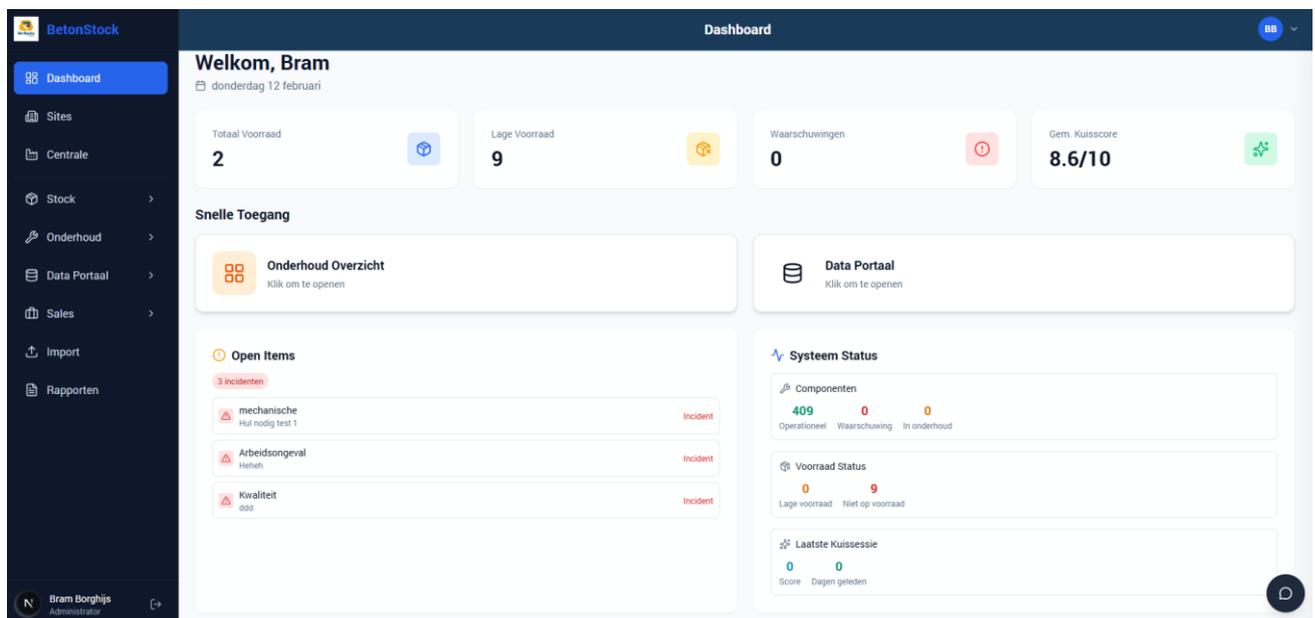
## The Problem

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

| NAAM  | CATEGORIE | LOCATIE(S)     | EENHEID | VOORRAAD | STATUS        | ACTIES |
|---|-----------|----------------|---------|----------|---------------|--------|
| BOUT MET KOP (bolzen m. kopf bolt)          | Menger    | Site Kailo (0) | stuks   | 0        | Lage voorraad |        |
| Cilinder                                    | Doseur    | Site Kailo (0) | stuks   | 0        | Lage voorraad |        |
| Doseur Pomp                                 | Mengtoren | Site Kailo (0) | stuks   | 0        | Lage voorraad |        |
| Doseerklap                                  | Doseur    | Site Kailo (2) | stuks   | 2        | Op voorraad   |        |
| kuisrol                                     | Mengtoren | Site Kailo (0) | stuks   | 0        | Lage voorraad |        |
| Polygonaal stoffilter<br>WAM-FPHY45AQ010989 | Mengtoren | Site Kailo (0) | stuks   | 0        | Lage voorraad |        |

## 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 m<sup>3</sup> 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

**Onderhoud Agenda**

Week 7  
9 feb. – 15 feb. 2026

Meldingen  
Kanban board & overzicht

2 Dagmeldingen | 9 Inspectierondes | 6 Kuissessies | 9.0 Gem. Kuisscore

**Dagmeldingen** (2)

- don 12 feb. 60 m<sup>3</sup> Storing HERDERSEM
- din 10 feb. 50 m<sup>3</sup> Storing HERDERSEM

**Inspectierondes** (9)

- don 12 feb. Onbekend 08:56 – 08:57 HERDERSEM (2, 1)
- don 12 feb. Onbekend 13:21 – 13:22 HERDERSEM (2, 1)
- woe 11 feb. Onbekend 17:46 – 17:47 HERDERSEM (2, 1)
- woe 11 feb. Onbekend 17:53 – 17:53 HERDERSEM (2, 1)

**Kuissessies** (6)

- don 12 feb. Bram Borghijs HERDERSEM (9)
- don 12 feb. Bram Borghijs HERDERSEM (9)
- woe 11 feb. Bram Borghijs HERDERSEM (9)
- woe 11 feb. Bram Borghijs HERDERSEM (9)
- din 10 feb. Alexander De Rycke HERDERSEM (8)

**Meldingen**

0 Open | 1 In behandeling | 1 Opgelost | 2 Verloren uren | 50 Verloren m<sup>3</sup>

Q Zoek op titel... | Alle categorieën | Alle personen

**In behandeling** (1)

- Hul nodig test 1  
Andes  
Niet toegewezen  
12 feb. 2026

**Opgelost** (1)

- Stilstand door kapot ventiel  
Kalf-G Pneumatica  
A. Bilal Celik  
2x 30 m<sup>3</sup>  
11 feb. 2026

## 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

The screenshot shows the 'Selecteer Centrale' dashboard in the BetonStock application. The interface is divided into three main sections based on plant type:

- Drijvende Centrales (Op Water):** Contains two large cards. The first is 'Bonton' with a green border, status 'Actief', and location 'Haven Antwerpen'. The second is 'Contoon' with a yellow border, status 'In onderhoud', and location 'Gent'.
- Verplaatsbare Centrales:** Contains four smaller cards with gear icons. 'T1' and 'T2' have green borders and status 'Actief'. 'T3' has a yellow border and status 'In onderhoud'. 'T4' has a green border and status 'Actief'.
- Vaste Sites:** Contains five cards grouped by location: 'Site Herdersem' (DRA), 'Site Kallo' (Ka1, Ka2), and 'Site Kieldrecht' (Ki1, Ki2).

A left sidebar contains navigation options like Dashboard, Sites, Centrale, Stock, and Onderhoud. The user profile 'Bram Borghijs' is visible at the bottom left.

## 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)

The screenshot shows the 'Data Portaal' dashboard in the BetonStock application. The main content area is titled 'Data Portaal' and 'Beheer chauffeurs, voertuigen en documenten'. It features several summary cards and detailed sections:

- Summary Cards:**
  - Chauffeurs: 57
  - Voertuigen: 2
  - Actieve Klanten: 3
  - Verlopende Documenten: 2
- Verlopende Documenten:** A list of documents with expiry dates:
  - Wilm Vermanden (Rijbewijs): 5 dagen (17/2/2026)
  - Bram Borghijs (Rijbewijs): 13 dagen (26/2/2026)
- Snelle Acties:** A grid of quick actions:
  - Chauffeur Toevoegen
  - Voertuig Toevoegen
  - Klant Uitnodigen
  - Vervaldata's Bekijken

The left sidebar shows navigation options including Stock, Voorraad Beheer, Bestellingen, Offertes, Leveranciers, Onderhoud, and Data Portaal. The user profile 'Bram Borghijs' is visible at the bottom left.

## Data Portal – Client view

The screenshot shows the 'Data Portaal' interface. At the top, there's a header with the logo and 'Data Portaal total'. A navigation bar indicates 'Toegang tot 22 april 2026'. Below the header, there's a prominent blue button labeled 'Alle Documenten Downloaden' with a subtext 'Download alle 3 documenten als ZIP-bestand' and a 'Download ZIP' button. A search bar is present with the placeholder 'Zoek op naam of kenteken...'. The main content area is titled 'Uw Units (2)' with a subtext 'Klik op een chauffeur of voertuig voor details en documenten'. It features a table with two columns: 'Chauffeur' and 'Voertuig'. The table lists two units: one for 'Ignace De Cauwer' (1 document) and another for 'Wilm Vermanden' (1 document). Each unit entry includes a vehicle icon and details like '1-ABC-123 Mercedes (primair)' and '2-ABC-15 Volvo Actros (primair)'. The footer contains copyright information '© 2026 De Ryckse Beton' and contact details 'Contact: beton@deerycke.be +32 3 570 90 53 (dispatch)'.

## 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

The screenshot displays the 'Sales Dashboard' for 'BetonStock'. The top navigation bar includes the logo and 'BetonStock' with a user profile icon. The dashboard is dated 'donderdag 12 februari'. It features four summary cards: '2 Personen', '0 Klanten', '0 Offertes', and '0 Openstaand'. Below these are two main sections: 'Snelle Notitie' and 'Zoek Offerte'. The 'Snelle Notitie' section has a search bar for 'Persoon', a dropdown menu, and a text input field. The 'Zoek Offerte' section has a search bar for 'Zoek op nummer, klant of project...'. At the bottom, there's an 'Aandacht Nodig' section with a green checkmark and the text 'Alles is up-to-date!'. To the right, a 'Recente Activiteit' section lists several 'Notitie' entries by 'Wilm Sterks' with dates ranging from 3/2/2026 to 4/2/2026. A bottom navigation bar includes '+ Snelle Toegang' and buttons for 'Nieuwe Klant', 'Nieuwe Persoon', and 'Bekijk Projecten'.

## 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

**Rapporten**

Genermeer rapporten met AI of gebruik voorgedefinieerde templates

Alle Stock 3 Bestellingen 3 Onderhoud 3 Kuiss 2 Data Portaal 3

**Voorraad per Site**  
Overzicht van alle voorraadniveaus per site  
Stock

**Lage Voorraad Waarschuwingen**  
Producten die onder het minimum niveau zitten  
Stock

**Voorraad Mutaties per Maand**  
Overzicht van in- en uitgaande voorraadmutaties  
Stock

**Bestellingen per Maand**  
Maandelijks overzicht van aantal bestellingen en totaalbedragen  
Bestellingen

**Bestellingen per Leverancier**  
Verdeling van bestellingen over leveranciers  
Bestellingen

**Bestelwaarde per Maand**  
Totale bestelwaarde per maand in EUR  
Bestellingen

**Onderhoudstaken Status**  
Verdeling van onderhoudstaken per status  
Onderhoud

**Incidenten per Ernst**  
Overzicht van incidenten gegroepeerd op ernst  
Onderhoud

**Component Status Overzicht**  
Status van alle componenten/machines  
Onderhoud

**Kuisscore Ranking**  
Gemiddelde kuisscores per centrale  
Kuiss

**Kuissfrequentie per Maand**  
Aantal kuissessies per maand  
Kuiss

**Chaufeurs Overzicht**  
Overzicht van alle chaufeurs per type  
Data Portaal

**Voertuigen Status**  
Verdeling van voertuigen per status en type  
Data Portaal

**Documenten Vervalddatum**  
Documenten die binnenkort verlopen (30 dagen)  
Data Portaal

**AI Vraag**

Wat is de gemiddelde kuisscore per centrale?

Hoeverveel bestellingen zijn er per leverancier? | Wat is de gemiddelde kuisscore per centrale? | Welke producten zitten onder het minimum niveau? | Toon de top 5 duurste bestellingen

**Gemiddelde Kuisscore per Centrale**

HERDERSEM KALL01 KIELDRECHT2

■ Gemiddelde Kuisscore

| CENTRALE ID | GEMIDDELDDE KUISSCORE |
|-------------|-----------------------|
| HERDERSEM   | 9                     |
| KALL01      | 8,70                  |
| KIELDRECHT2 | 8,20                  |

Deze query berekent de gemiddelde kuisscore voor elke centrale, gebaseerd op de scores die zijn toegekend aan de kuissessies. De resultaten worden gesorteerd op de gemiddelde score, van hoog naar laag.

```

SELECT
  cs.centrale_id AS "Centrale ID",
  AVG(cs.score) AS "Gemiddelde Kuisscore"
FROM
  c.storing_sessions AS cs
WHERE
  cs.score IS NOT NULL
GROUP BY
  cs.centrale_id
ORDER BY
  "Gemiddelde Kuisscore" DESC
LIMIT 100

```

AI inzichten genereren over deze resultaten

## 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

|                                |                              |                               |                         |
|--------------------------------|------------------------------|-------------------------------|-------------------------|
| <b>75+</b><br>React Components | <b>40+</b><br>Pages / Routes | <b>30+</b><br>Database Tables | <b>59</b><br>Migrations |
| <b>40+</b><br>Permissions      | <b>6</b><br>User Roles       | <b>6</b><br>Modules           | <b>3</b><br>Site Types  |

---

Built by Bram Borghijs — 2025-2026