DB REALM
CLOUD & DATA SOLUTIONS

CASE STUDY · 2026

BUILT FOR DATA FOR GOOD CALGARY

A whole volunteer operation on one Oracle platform

Intake, two CRMs, projects, e-signature, meetings, a public website and private AI, designed, built and run by DB Realm on Oracle APEX 26.1 and Oracle AI Database 26ai on OCI.

185
pages across two Oracle APEX apps

11
modules sharing one data model

24
PL/SQL packages written for the system

2,295
records searchable by meaning

What the platform delivers

One source of truth
CRM records, forms, signatures and projects meet in one database, not six separate tools.

Private, accountable AI
An on-premises model answers questions from the data, suggests matches and logs every call.

Consent by design
Do-not-email contacts are always excluded, and live sending is off until an admin enables it.

Run like production
A web firewall, a full audit trail, a monitor for silent failures and tests that gate every release.

BUILT WITH

- Oracle APEX 26.1
- Oracle AI Database 26ai
- Oracle Cloud Infrastructure
- Oracle AI Vector Search
- PL/SQL
- APEXlang in git
- utPLSQL + Playwright

One database at the centre of the operation

Every service connects to the database; people reach two apps through one firewall.



Integrations run as PL/SQL packages inside the database; their credentials are stored encrypted. Third-party names identify services the platform connects to; DB Realm is not affiliated with their owners.

Eleven modules, one data model

Every module reads and writes the same Oracle schema, so a volunteer, a project or a signature means the same thing on every page.

Project management

Partner and micro projects, members, roles, NDA status, team accounts.

Intake & positions

Expressions of interest, dated recruitment rounds, AI screening.

Resource library

Curated catalog, moderation queue, click tracking, link checks.

HubSpot mirror

Contacts, companies and engagements, pulled every 6 hours and reconciled.

Mautic mirror

Volunteer CRM with tags, do-not-contact, a map and semantic search.

Micro-projects

Ready to launch

Suggest, approve, advertise, recruit, assign, deliver, showcase.

Email & campaigns

Send gated

Templates, brands and consent-floor campaigns.

AI assistant

Private model, grounded answers, vector search and a one-click model switch.

Security & admin

Own sign-in, email codes, feature-level access, audit trail.

Monitoring

Activity, errors, email and AI logs, link health and backend job alerts.

Public site

Volunteer forms, NDA, collaboration requests, resources, feedback.

ON THE ROADMAP

77

features tracked on a roadmap generated from one data file

UNDER THE HOOD

112
tables in one schema

24
PL/SQL packages written for DfG

12
scheduled jobs, monitored hourly

18
authorization schemes in the staff app

From first form to finished project

Eight steps, one record. Each step is a module of the platform, and each hand-off is automatic or one click.

01
Google Forms · public site
Expression of interest
A volunteer applies through a form or the public site; the answers land in the database.

02
HubSpot · Mautic
CRM mirror
HubSpot and Mautic profiles are mirrored in, so skills, tags and consent are on hand.

03
Oracle AI Vector Search
AI-assisted matching
Vector search ranks volunteers against a project's needs. A person decides.

04
Project management
Project assignment
The core team approves and assigns; the volunteer joins the project as an invited member.

05
DocuSeal
NDA e-signature
Projects that need an NDA send it for signing; the status syncs back every night.

06
NextCloud
Collaboration accounts
Workspace accounts and project groups are created for the team.

07
Meetings module
Meetings & attendance
Meetings are scheduled, rosters generated, attendance recorded and reported.

08
Public showcase · ready to launch
Showcase
Finished projects are published with their outcome and an opt-in team credit.

WHAT STAFF SEE

Member record

AC
Avery Chen
avery.chen@example.org

Data visualization · SQL · Python

Project: **Riverbank Cleanup Dashboard**

Expression of interest	**Received**
CRM profile	**Matched**
NDA	**Signed**
Workspace account	**Active**
Attendance	**5 of 6 meetings**

Project showcase

Riverbank Cleanup Dashboard

A volunteer team turned cleanup logs into a public map of litter hot spots for a riverside society.

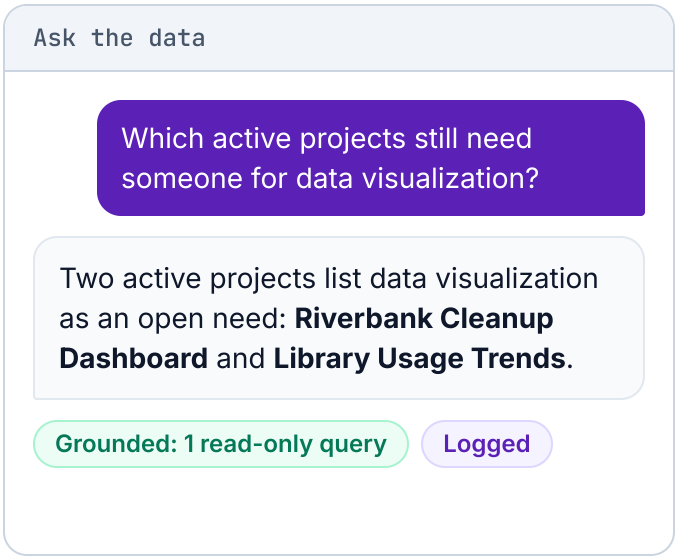
Estimated — 4 weeks
Delivered — 5 weeks

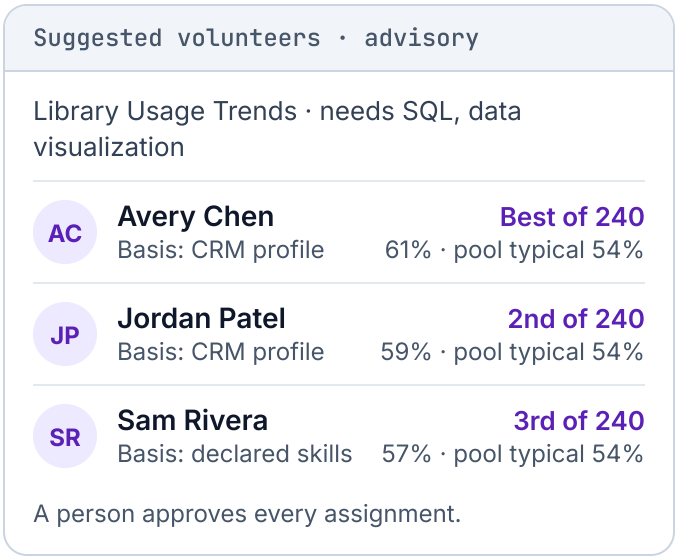
Team (opted in): **Avery C., Jordan P., Sam R.**

Mock-ups. People, projects and values are fictional.

AI that stays private, grounded and accountable

Five AI features help staff ask questions, screen applicants and match volunteers. All of them run on a private model, read the data they cite, and leave a record.





Mock-ups. People, projects and values are fictional.

Private model

Models run on a private on-premises server. Volunteer data never goes to a public AI service.

Search by meaning

Oracle AI Vector Search: 2,295 embeddings across 9 record types, HNSW index.

Read-only answers

A question becomes one read-only query over approved views, checked again before it runs.

Advisory only

Screening and matching suggest; staff decide. AI never changes a record on its own.

Calibrated scores

A match shows its rank and the pool's typical score, never a bare percentage.

Every call logged

Prompt, response, feature and duration of every AI call go to an admin-only log.

One switch, every feature. An admin picks the language model for all five AI features from one list. Today: gpt-oss-120b for answers, qwen3-embedding for search.

Open to the public, careful with consent

The public site brings volunteers, partners and visitors in. The email tools only ever reach people who said yes.

Resource library

A searchable catalog of data tools and learning, with facets and broken-link flags. Visitors can suggest new resources.

Open positions

Recruitment rounds open and close on their dates; the Positions menu only appears while a round is open.

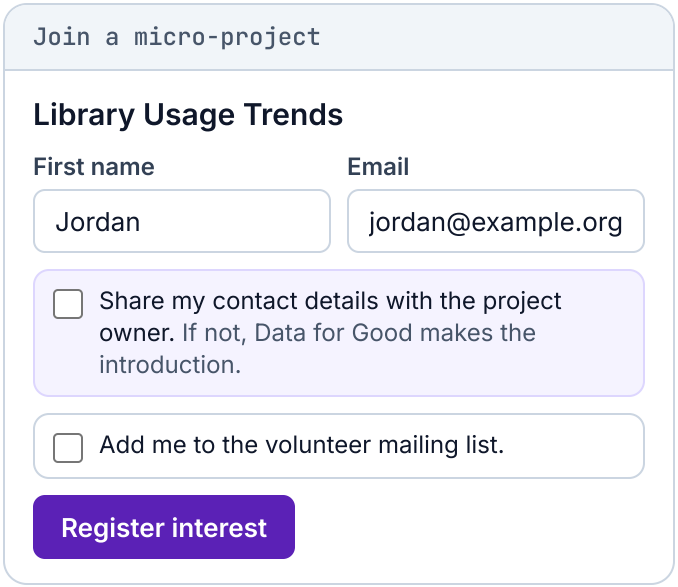
Micro-projects

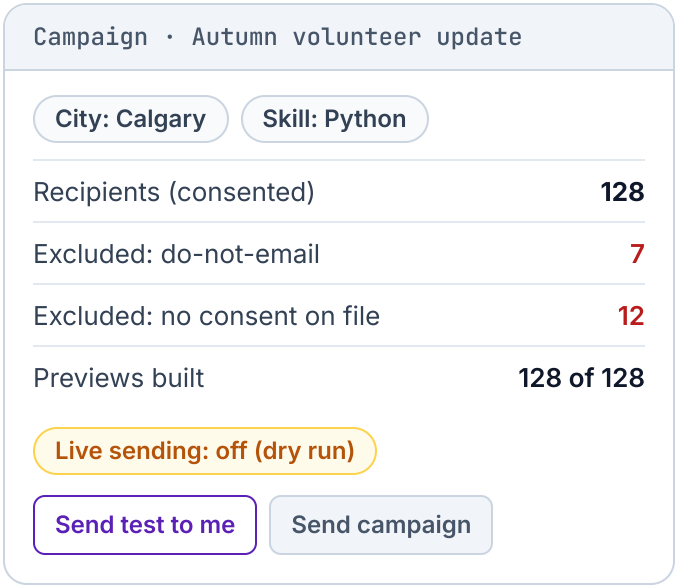
Ready to launch

Organizations suggest a small data project; staff review and advertise it; volunteers join. Owners use a private link.

Email & campaigns

15 branded templates with live preview and versions. Campaigns preview every recipient's email before anything is sent.





Mock-ups. People, projects and values are fictional.

Two separate choices

Sharing contact details and joining the list are separate, unticked boxes.

A consent floor

Do-not-email and unconsented contacts are removed in the database, every time.

Sending is gated

Live sending is off until an admin enables it; tests go to an admin inbox.

Run with production discipline

Least-privilege access, a full audit trail, monitoring that catches silent failures, and release gates that run before every import.

SECURITY

Access by feature and role
18 authorization schemes; every page, button and link is gated to match.

Passwordless sign-in
Email codes: 6 digits, 10 minutes, 5 tries. Only their hashes are stored.

Audit trail
Admin actions and sign-ins in one trail; access links revocable from a monitor.

Web application firewall
OCI WAF blocks an abusive AI crawler; OWASP rules and rate limits in detection.

RELIABILITY & OPERATIONS

Backend job monitor
Hourly checks of 12 jobs for loud and silent failures; one alert per problem.

Reconciliation counts
Each HubSpot sync stores HubSpot's own total beside the local count.

Link health
Every resource link checked weekly, with run history and one-click re-check.

QUALITY: FOUR TEST LAYERS

4 · Browser tests
170 Playwright tests on the twin; 39 read-only on production

3 · Region sweep
109 pages of both apps rendered and checked for any error

2 · Database unit tests
64 utPLSQL tests on the PL/SQL the pages rely on

1 · Fast gates
5 source checks on every commit

A non-production twin
The full gate runs on a copy of the system before every release. Tests that write data run only there; three independent controls refuse production.

WHY THE MONITOR EXISTS

A scheduled sync once reported success on 100 runs in a row while pulling nothing for 25 days. Now the platform checks the work, not just the job.

How DB Realm delivers

The habits that keep this platform healthy are the ones we bring to every engagement.

01

Source in git, not only in a browser

Every page of both apps lives in git as APEXlang text, so changes are reviewed, compared and rebuilt like any other code.

02

Independent, versioned releases

Each app carries its own version and only the app that changed is imported, so staff-app work never disturbs the public site.

03

A backup on each side of every release

The app is exported before and after each import, so every version has a restore point.

04

A roadmap generated from data

77 features across 11 modules live in one data file; the roadmap page is rebuilt from it and checked on every commit.

05

Agent-assisted, verification-gated

AI coding agents do much of the building. Gates, tests and live checks decide what ships, and each lesson learned is written down.

Dec 2025
First commit

Jul 2026
Security and administration rebuild

Aug 2026
Backend job monitoring

Oct 2026
Staff app v21.3, public site v11.10, release gates

DB REALM
CLOUD & DATA SOLUTIONS

Have an operation that has outgrown its spreadsheets?

DB Realm designs and builds Oracle APEX, Oracle AI Database and OCI systems, then keeps them running.

START A CONVERSATION

dbrealm.ca