

CIDM6325-70: Electronic Commerce and Web Developmet Project Pitch Memo

Subject: Mineral & Gemstone Collection Catalog Web Application

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Introduction

This memo proposes the design and development of a web-based application **Mineral & Gemstone Collection Catalog** built using Python, Django, and possibly: Django REST Framework (DRF), and MySQL/MariaDB. The system aims to provide mineral collectors, hobbyists, and amateur geologists with a structured, reliable, and accessible method of documenting their collections.

The application addresses longstanding gaps in how collectors record specimen information. Many currently rely on ad-hoc spreadsheets and device-scattered photos, creating inconsistencies in provenance, naming, and metadata. This project introduces a structured catalog that supports CRUD operations (create, read, update, delete), image upload, and accessibility-first design.

Problem Statement

Collectors (hobbyists, traders, and club members) often track mineral specimens in spreadsheets or handwritten logs, while photos are stored across devices—or not linked to catalog records at all. This fragmented approach produces several pain points:

- **Loss of Provenance:** Specimen acquisition details (time, source, location) are often missing or inconsistent.
- **Inconsistent Metadata:** Naming conventions vary, reducing data reliability and shareability.
- **Poor Accessibility:** No standards for image labeling or descriptive alt text make catalogs difficult for visually impaired users or broader community engagement.
- **Weak Search Capabilities:** Spreadsheet filters are limited, and image-based searching is absent.

A structured Django-based application provides a professional, archival-quality platform that enables collectors to build, search, and share their catalogs reliably and accessibly.

Stakeholders

- **Primary:** Individual collectors, amateur geologists, mineral enthusiasts, lapidarists.
 - **Secondary:** Collectors functioning as buyers/sellers who require provenance and cost history.
 - **Tertiary:** Family members, inheritors, or club members viewing catalogs.
 - **Administrative:** System administrators overseeing governance, account management, and system and catalog integrity.
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Scope and Minimal Viable Artifact (MVA)

The scope balances feasibility within a graduate-level, 2–4 week timeframe while laying foundations for future iterations.

MVA Features (likely shippable within 2 weeks):

- 1. **User Accounts & Authentication** – Basic login, registration, and account management.
- 2. **CRUD for Mineral Records** – Create, update, delete, and view mineral entries.
- 3. **Image Upload & Storage** – Attach one or more photos per record with required alt text.
- 4. **Search/Filter Functionality** – By mineral name, class, acquisition source, or date.
- 5. **Accessibility Baseline** – Use of alt text, consistent labeling, and semantic HTML.

Future Iterations Considerations (beyond MVA):

- Advanced filters (hardness, streak, luster).
- Multi-user collection sharing.
- Marketplace integration (buy/sell tracking).
- Mobile-first responsive design.

Success Metrics

- 1. **Usability:** Users can enter and retrieve records within three clicks, with no major navigation confusion during testing.
- 2. **Data Quality:** At least 95% of entries contain complete metadata fields (e.g., mineral name, acquisition source, date).
- 3. **Accessibility Compliance:** WCAG 2.1 AA standards followed for alt text and labeling.
- 4. **Deployment Feasibility:** The app deploys successfully to IONOS-hosted MySQL/MariaDB within the given timeframe.
- 5. **Performance:** Query responses under 2 seconds for datasets up to 5,000 records.

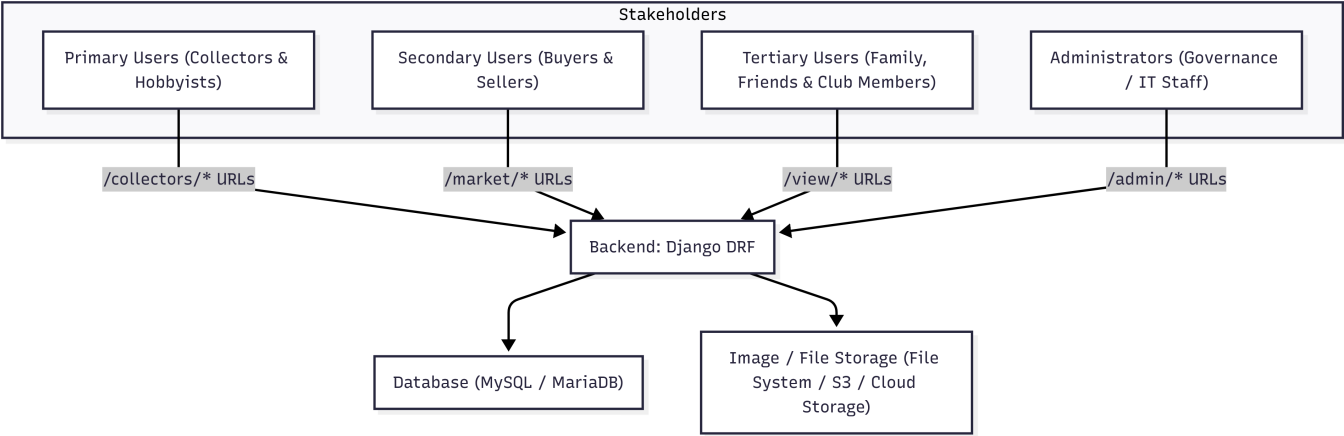
Dataset Description

Core Entity: Mineral Record

- `specimen_id` (auto-generated unique identifier)
- `mineral_name` (string, required)
- `mineral_class` (silicate, oxide, carbonate, etc.)
- `physical_attributes` (color, hardness, streak, luster, crystal system)
- `acquisition_details` (source, date, method)
- `financial_details` (purchase price, estimated value, selling price if applicable)
- `provenance_notes` (free text field)
- `images` (file path, alt text)
- `owner_id` (user reference)

This schema ensures traceability, archival quality, and structured provenance.

System Sketch



Note: Generated with Mermaid Chart: 9/14/2025.

Evidence Base

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Risk Register

Risk	Description	Mitigation
Data Loss	Images and records may be lost during upload failures or server crashes.	Implement automated backups; use transaction-safe operations.
Accessibility Gaps	Incomplete alt text may reduce usability for visually impaired users.	Enforce required alt text field on uploads; perform accessibility audits.
Performance Issues	Queries may slow as the dataset grows beyond initial testing.	Optimize database indexing; use pagination and caching.

Evaluation Alignment

- **Clarity of Problem Framing & Realism of Scope:**
The problem of fragmented cataloging is clearly identified, and the MVA is deliberately scoped to CRUD, search, and accessibility—achievable within 2 weeks.
- **Design Coherence & Traceability:**
Each goal (structured storage, provenance, accessibility) directly maps to architecture choices (Django, MySQL/MariaDB, WCAG compliance).

- **Evidence Quality & Integration:**

The design references authoritative standards (WCAG), academic preservation literature, and Django's established ecosystem.

- **Communication Quality:**

This memo is structured, professionally written, and integrates evidence, a diagram, and risk assessment. Supplemental technical documentation will be stored in a `/docs/` folder on GitHub for traceability.

Conclusion

The **Mineral & Gemstone Collection Catalog** project directly addresses the fragmented state of current collection management by providing a **structured, accessible, and reliable web application**. By focusing on an achievable MVA—including CRUD features, image upload, and accessibility—the project can deliver tangible value within two weeks while laying the foundation for future expansions.

This project exemplifies how graduate-level application design can merge **practical utility, technical rigor, and accessibility standards** into a deployable solution. With strong stakeholder benefits, evidence-driven design, and a clear risk management strategy, it is well-positioned for successful implementation and evaluation.

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