

Metier CX App — MVP Requirements v0.1

Overview

The Metier CX App is a web-based platform designed to transform the customer experience. It combines a searchable, structured product catalog with AI-powered assistance, fitment verification, and professional order management.

Metier admins can upload and manage products, pricing, inventory, photos, and fitment/compatibility data (year/make/model/engine). Customers can search for products, ask AI-guided product questions, build carts, save lists, submit orders, and download professional PDFs. If a product isn't in the catalog, the system collects details, creates a follow-up ticket, and notifies Metier staff.

This MVP focuses on delivering a reliable product catalog, fitment matrix, AI Q&A with guardrails, saved lists and re-orders, and streamlined order workflows. It establishes the foundation for scaling into payments, ERP integrations, and personalization in future phases.

1. Goals & Success Metrics

- **Primary goal:** Help customers quickly find the right part, verify compatibility, and submit accurate orders.
 - **Success metrics:**
 - Zero-result search rate < 8%
 - PDP → Cart add rate \geq 12%
 - AI Q&A deflection rate \geq 60% with \geq 95% correctness
 - New SKU time-to-publish (admin workflow) \leq 10 minutes
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2. User Roles

- **Guest:** Browse/search catalog, view products, add to cart, submit orders.
 - **Customer (logged-in):** All guest features plus saved lists, one-click re-order, order history, AI Q&A.
 - **Admin:** Add/edit products, upload photos, **set pricing** at upload, manage inventory, upload fitment matrix, approve AI descriptions, and manage related products.
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3. Core User Stories

- **Search & Discover:**
 - Users can search by SKU, model, alias, or keywords (with typo tolerance and synonyms).
 - Users can filter by brand, category, and availability.
 - Users can save vehicle/equipment profiles; search filters to compatible products.
- **Product Detail Page (PDP):**
 - Displays product title, price, MSRP, specs, images, availability, and compatibility.
 - Shows related products.
 - Provides expandable AI explanation of compatibility based on structured rules.
 - Allows users to ask product-related questions answered by AI with sources.
- **Cart & Order:**
 - Add products with quantities, review cart, and submit orders.
 - Download professional PDF of the order/quote (also emailed).
 - Order history saved for logged-in customers.
- **Saved Lists & Re-Order:**
 - Users can create and manage lists (e.g., “Shop Stock,” “Customer X”).

- One-click re-buy from any saved list or past order.
 - **Out-of-Catalog Request:**
 - If no product match, AI collects details (manufacturer/part #, qty).
 - System creates a ticket and notifies staff.
 - **Admin Workflows:**
 - Upload products with pricing, photos, categories, aliases.
 - Upload or paste fitment (Y/M/M/E matrix).
 - Generate AI-drafted descriptions/spec tables; approve before publishing.
 - Set related products manually or review AI suggestions.
 - Adjust inventory and track changes.
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4. Fitment/Compatibility

- Fitment stored in structured matrix: `year_from` , `year_to` , `make` , `model` , `submodel` , `engine` , `notes` .
 - PDP displays compatibility as **Compatible**, **May Fit with Modifications**, or **Not Compatible**, with notes.
 - AI explanations cite only structured fields and notes. If uncertain, AI asks clarifying questions.
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5. AI Guardrails

- **Retrieval-Augmented Generation (RAG):** AI answers only from product catalog, specs, and fitment data.
- **System behavior (Q&A):**
- Answer only about Metier products and compatibility.
- If data is insufficient, request Y/M/M/E details or escalate to a human.

- Never guess pricing, delivery dates, or safety-critical advice.
 - **System behavior (Content):**
 - Draft concise, accurate PDP descriptions.
 - Include structured specs and a “Why this part” section.
 - Never invent details not present in admin-supplied data.
 - **Human-in-the-loop:** Admin must approve AI-generated product descriptions before publishing.
 - **Auditability:** Log all AI prompts, responses, and sources used.
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6. Data Model (Key Entities)

Users: id, email, password_hash, name, company, phone, role, created_at **Products:** id, sku, model, title, brand, category_id, msrp, price, status, created_at, updated_at **ProductDetails:** product_id, short_desc, long_desc, specs_json, install_notes, seo_slug **ProductImages:** id, product_id, url, alt_text, sort_order, is_primary **Inventory:** product_id, on_hand, on_order, backorderable, updated_at **Categories:** id, parent_id, name, slug, sort_order **Fitment:** id, product_id, year_from, year_to, make, model, submodel, engine, notes **Aliases:** id, product_id, alias_type, value (OEM #, alternate #, superseded #) **RelatedProducts:** product_id, related_product_id, relationship_type, rank **Carts & CartItems:** standard cart structure with user_id, product_id, qty, unit_price_snapshot **Orders & OrderItems:** order metadata + itemized products **SavedLists & SavedListItems:** reusable lists of products with default qty **Tickets:** product requests or AI escalations **AIContent:** drafts, approvals, and final content logs **AuditLog:** tracks all admin actions (before/after values)

7. Example Product JSON

```
{
  "sku": "MET-7811",
  "model": "GTX-2867R",
  "title": "GTX 2867R Turbocharger",
  "brand": "Metier",
  "price": 899.00,
  "msrp": 999.00,
  "category": "Turbochargers",
  "specs": {
    "compressor_inducer_mm": 54.0,
    "turbine_housing": "0.64 A/R",
    "bearing": "Dual ball",
    "material": "Inconel/Aluminum"
  },
  "aliases": [
    {"alias_type": "OEM", "value": "14411-AA710"},
    {"alias_type": "ALT", "value": "GTX2867R-64"}
  ],
  "fitment": [
    {
      "year_from": 2015, "year_to": 2018,
      "make": "Subaru", "model": "WRX", "submodel": "STI", "engine": "2.5L
EJ25", "notes": "Requires up-pipe adapter"
    }
  ],
  "inventory": {"on_hand": 17, "on_order": 20, "backorderable": true}
}
```

8. Feature Acceptance Criteria

- **Pricing on Upload:** Admin form requires MSRP and Price fields. Price changes logged to `AuditLog`.
 - **Fitment Matrix:** Supports CSV import with validation and preview. Invalid rows highlighted.
 - **Saved Lists & Re-Order:** Lists are named, reusable, and re-order adds all items to cart. Out-of-stock items flagged.
 - **AI Q&A:** Responses must show “Based on:” fields (e.g., Fitment rows, Specs). Unknown → clarifying question or ticket creation.
 - **Order PDF:** Branded, includes line items, totals, terms, QR to order page, and unique ID.
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9. API Endpoints (MVP Scope)

Public:

- Auth: `POST /auth/signup`, `POST /auth/login`
- Catalog: `GET /products`, `GET /products/{id}`, `GET /products/{id}/related`
- Cart: `POST /cart`, `GET /cart`, `POST /cart/items`, `PATCH /cart/items/{id}`, `DELETE /cart/items/{id}`
- Orders: `POST /orders/submit`, `GET /orders/mine`, `GET /orders/{id}`
- AI Q&A: `POST /ai/qa`

Admin:

- `POST /admin/products` (with price, msrp, specs, images)
 - `POST /admin/products/{id}/fitment:import` (CSV)
 - `POST /admin/products/{id}/ai/description:draft` → draft text
 - `POST /admin/products/{id}/ai/description:approve`
 - `PATCH /admin/inventory/{productId}`
 - `POST /admin/related/{productId}`
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10. Search & Discovery

- Weighted search index: `title^3`, `sku^5`, `aliases^4`, `brand^2`, `fitment.*`.
 - Synonyms: turbocharger ↔ turbo, compressor wheel ↔ impeller.
 - Typo tolerance: up to 2 edits.
 - Results ranked by SKU match > alias > title > category.
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11. Security, Privacy, Accessibility

- RBAC for admin roles (Admin, Content Editor, Inventory, Sales).

- Rate limits on `/ai/*`.
 - Audit logs for all admin actions.
 - GDPR/CCPA compliance and cookie consent.
 - WCAG 2.2 AA compliance for all user-facing pages.
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12. Tech Outline

- **Frontend:** Next.js (React), Tailwind, shadcn/ui; SSR for SEO.
- **Backend:** FastAPI (Python) or NestJS (Node) — to be chosen at scaffolding.
- **Database:** Postgres + Prisma/SQLAlchemy; pgvector for AI search.
- **Search:** Typesense (self-host) or Algolia (hosted).
- **Storage/CDN:** AWS S3 + CloudFront.
- **PDF:** Playwright HTML→PDF generation.
- **Observability:** Sentry (errors), OpenTelemetry (traces).