MVP Scope Definition

Phase 0.1 — Scope Lock (FINAL)

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Project: AetherFlow (Retail/E-Commerce Intelligence MVP)
Purpose: Define exactly what will be built (departments, datasets, outputs, screens, and user stories) to prevent scope creep and guide all implementation decisions.

Scope Rule: If it's not in this document, it is **post-MVP**.

Objective

Objective (North Star)

Establish a crystal-clear scope for what will be built in this project. Define exactly which departments, datasets, features, and screens will exist in the MVP. This prevents scope creep and provides a north star for all subsequent implementation decisions.

Why This Matters

Why this matters (Scope Discipline)

Without a concrete scope definition, development will get stuck in endless "should we add this?" decisions. A well-defined MVP lets the team confidently label ideas as "post-MVP," stay focused, ship a complete working system, and then iterate safely.

Finalized MVP Scope

1) Departments (FINAL)

MVP Departments (FINAL)

The MVP will support exactly three departments, each with distinct data access and a department-specific dashboard. These three were selected because they reflect a realistic retail business with clearly separated decision needs.

Department	Primary Data Concern (1 sentence)	Why this belongs in MVP (1 sentence)
Sales	Monitor performance and predict near-term revenue trends by category and region to guide sales strategy.	Represents the core revenue engine; forecasting + KPI dashboards are highly intuitive and interview-relevant.
Supply Chain (Inventory)	Prevent stockouts by tracking inventory levels and lead times and identifying which SKUs need reorder actions soon.	Represents operational reliability; inventory risk logic demonstrates systems thinking and pipeline automation.
Finance	Detect unusual spending patterns and ensure transactions are compliant and explainable for rapid investigation.	Represents governance and risk; anomaly detection + audit-ready outputs show enterprise readiness.

2) Datasets (FINAL)

Dataset Definition (FINAL)

Each department has exactly one dataset type in the MVP, uploaded as CSV. Three sample CSV files will exist in the repository under `/sample_data/` and are used in testing and demos.

Department	Dataset Type + Column Specification (FINAL)	Sample CSV File (FINAL)
Sales	**Sales Transactions:** `transaction_id`, `date`, `store_id`, `region`, `product_category`, `sku`, `quantity`, `unit_price`, `discount_pct`, `customer_segment`, `payment_method`.	`sales_transactions_sample.csv`
Supply Chain (Inventory)	**Inventory Snapshot:** `snapshot_date`, `warehouse_id`, `sku`, `product_category`, `current_stock`, `daily_demand_avg`, `lead_time_days`, `reorder_point`, `min_order_qty`, `supplier_id`.	`inventory_snapshot_sample.csv`
Finance	**Finance Ledger:** `txn_id`, `date`, `department`, `cost_center`, `category`, `vendor`, `amount`, `currency`, `payment_type`, `approval_status`, `notes`.	`finance_ledger_sample.csv`

Edge Cases Required in Sample Data (FINAL)

Each sample CSV must contain normal cases and intentional edge cases to test validation and pipeline robustness:

- Missing values (e.g., blank discount, missing vendor, missing lead time)
- Outliers (e.g., unusually large finance amount; unusually high daily demand)
- Type issues (e.g., quantity as text; amount with extra symbols)
- Boundary values (e.g., current_stock = 0; reorder_point = 0; discount_pct = 100)
- Duplicate identifiers (e.g., repeated `transaction_id` once to test idempotency handling)

3) Analytical Outputs (FINAL)

Analytical Outputs (FINAL)

Each department receives exactly one analytical output that is specific, measurable, and verifiable. These outputs are stored in the database and visualized on the department dashboard.

Department	Analytical Output (Specific + Testable)	Verification Method (FINAL)
Sales	Forecast next-week revenue by **product category** and list the **top 5 revenue-driving categories** with predicted revenue values.	Check that the dashboard shows (1) category-level forecast numbers, (2) top-5 list, and (3) totals match computed outputs in stored results.
Supply Chain (Inventory)	Flag SKUs at risk of **stockout within 14 days** using `current_stock`, `daily_demand_avg`, and `lead_time_days`, and suggest **reorder quantity** per SKU.	Confirm flagged SKUs include cases where projected stock reaches 0; verify reorder quantity formula produces positive values and respects `min_order_qty`.
Finance	Identify transactions that deviate significantly from normal spending by **category** (anomaly flags) and output a ranked list of top anomalies with reasons (e.g., z-score or rule-based threshold).	Validate anomalies include the synthetic outlier rows; confirm each flagged row includes a reason field and appears in dashboard table.

4) Frontend Screens (FINAL)

Frontend Screens (FINAL)

The MVP frontend will include exactly five screens. Every screen is role-aware, and access is enforced by the backend (RBAC), not only by frontend routing.

Screen	What the user sees and can do (FINAL)	Wireframe Reference (FINAL)
Login	Email/password login; error messages for invalid credentials; redirects to dashboard upon success.	`docs/wireframes/01_login.png`
Registration	Create account; select department role (Sales/Supply/Finance); backend enforces role assignment; redirects to login.	`docs/wireframes/02_register.png`
Dataset Upload	Upload CSV; department auto-selected from user role (cannot upload into other departments); shows upload success and dataset ID.	`docs/wireframes/03_upload.png`
Job Status (Monitoring)	Table of jobs for the user's department: queued/processing/succeeded/failed; refresh/polling; error details on failures.	`docs/wireframes/04_jobs.png`
Department Dashboard (Analysis)	Department-specific dashboard: KPI cards + charts + tables; loads latest outputs; includes "last updated" timestamp.	`docs/wireframes/05_dashboard.png`

5) User Stories (FINAL: 18 stories)

User Stories (FINAL)

The MVP includes the following 18 user stories. These cover authentication, data upload, pipeline monitoring, and department dashboards. Each story is testable independently.

#	Role	User Story (FINAL)	System Area
1	Sales Manager	As a Sales Manager, I want to upload sales transaction data so that I can view forecasted revenue trends by category.	Upload + Dashboard
2	Sales Manager	As a Sales Manager, I want to see the top 5 predicted revenue-driving categories so that I can prioritize promotions.	Dashboard
3	Sales Manager	As a Sales Manager, I want errors on invalid CSVs so that I can correct format issues quickly.	Upload + Validation
4	Inventory Planner	As an Inventory Planner, I want to upload inventory snapshots so that I can identify stockout risk soon.	Upload + Dashboard
5	Inventory Planner	As an Inventory Planner, I want to see a list of SKUs at risk of stockout within 14 days so that I can reorder on time.	Dashboard
6	Inventory Planner	As an Inventory Planner, I want suggested reorder quantities so that I can place purchase orders efficiently.	Dashboard
7	Finance Analyst	As a Finance Analyst, I want to upload a finance ledger so that I can detect suspicious or unusual transactions.	Upload + Dashboard
8	Finance Analyst	As a Finance Analyst, I want flagged anomaly transactions with reasons so that I can investigate potential issues.	Dashboard
9	Finance Analyst	As a Finance Analyst, I want anomalies ranked by severity so that I can address the highest-risk items first.	Dashboard
10	Any User	As a user, I want to register and choose my department role so that I see the correct dashboards and permissions.	Auth + RBAC
11	Any User	As a user, I want to log in securely so that my data access is protected.	Auth
12	Any User	As a user, I want to view my profile role so that I know which department scope I'm operating under.	Auth + RBAC
13	Any User	As a user, I want the upload page to lock my department so that I cannot accidentally submit data to the wrong team.	RBAC + UI
14	Any User	As a user, I want to see job status updates so that I understand if the pipeline is processing my dataset.	Monitoring
15	Any User	As a user, I want to see clear failure messages when jobs fail so that I can debug and re-upload correctly.	Monitoring
16	Admin	As an admin, I want to view system status so that I can confirm services are healthy.	Ops + Health
17	Admin	As an admin, I want to verify RBAC enforcement so that cross-department access	Security + RBAC

Deliverables (FINAL)

Deliverables Checklist (FINAL)

❑ **MVP Definition Document (this document; 1–2 pages equivalent)**

- ❑Three finalized departments with one-sentence descriptions and rationale
- ❑Three finalized dataset types with explicit column specifications
- ❑Three finalized analytical outputs with measurable definitions
- ❑Five finalized frontend screens with functional descriptions
- ❑Final user story list (18 items)

❑ **Sample Datasets (3 CSV files; FINAL)**

- ❑`/sample_data/sales_transactions_sample.csv` (20–50 rows)
- ❑`/sample_data/inventory_snapshot_sample.csv` (20–50 rows)
- ❑`/sample_data/finance_ledger_sample.csv` (20–50 rows)
- ❑Each file includes normal cases + edge cases listed in Section 2

❑ **Wireframes (5 images; FINAL)**

- ❑`/docs/wireframes/01_login.png`
- ❑`/docs/wireframes/02_register.png`
- ❑`/docs/wireframes/03_upload.png`
- ❑`/docs/wireframes/04_jobs.png`
- ❑`/docs/wireframes/05_dashboard.png`

Acceptance Criteria (FINAL)

Acceptance Criteria (Must be true before moving to Phase 0.2 / Build)

- ❑You can explain the entire MVP in 60 seconds using only this document.
- ❑A new team member can read this and understand exactly what will be built (no ambiguity).
- ❑Each analytical output is specific enough to verify correctness with sample data.
- ❑Sample datasets include normal cases, edge cases, and error conditions to test validation and pipeline reliability.

Sign-off (Scope Lock)

Scope Rule (binding): Any feature not present in this document is **post-MVP**.

Author (Scope Owner): Shahriyar Ahmed Mahir **Date:** _____

Reviewer (Optional): _____ **Date:** _____