

# **Baseline Data Lineage Overview**

Finanzas SD – Architecture, Flows & SOPs

Arquitectura, Flujos y Procedimientos

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## 1 Baseline Data Lineage Overview

### 1.1 Purpose

This document explains the complete data lineage from PMO Estimator through Baseline to SDMT cost management, ensuring proper tracking and materialization of labor and non-labor costs.

### 1.2 Architecture Overview



### 1.3 Key Components

### 1.3.1 1. Canonical Rubros Taxonomy

**Location:** `src/modules/rubros.taxonomia.ts`, `src/modules/rubros.catalog.ts`

The rubros taxonomy provides the single source of truth for all cost categories:

- **MOD (Mano de Obra Directa):** Labor categories
  - MOD-ING: Support Engineers (N1/N2/N3)
  - MOD-LEAD: Delivery Engineers (Lead/Coordinator)
  - MOD-SDM: Service Delivery Manager
  - MOD-PM: Project Manager
  - etc.
- **GSV (Gestión del Servicio):** Service management
- **SOI (Soporte e Infraestructura):** Infrastructure support
- **SEC (Seguridad y Cumplimiento):** Security and compliance
- And more...

Each rubro has: - **linea\_codigo:** Canonical ID (e.g., "MOD-ING") - **linea\_gasto:** Display label - **categoria\_codigo:** Category code - **tipo\_ejecucion:** "mensual" or "puntual/hito" - **tipo\_costo:** "OPEX" or "CAPEX"

### 1.3.2 2. PMO Estimator

**Location:** `src/features/pmo/prefactura/Estimator/`

The Estimator UI allows users to create project estimates:

#### Labor Step (LaborStep.tsx)

- Users select MOD roles from dropdown (e.g., "Ingeniero Delivery")
- **CRITICAL:** Component stores canonical rubroId (e.g., "MOD-LEAD") not display string
- Maps display role → rubroId using `mapModRoleToRubroId()`
- Stores: 

```
{ rubroId: "MOD-LEAD", role: "Ingeniero Delivery", ...rates... }
```

#### Non-Labor Step (NonLaborStep.tsx)

- Users select rubros from categorized dropdown (organized by category)
- **CRITICAL:** Component stores canonical rubroId (e.g., "GSV-REU") not free-form category
- Auto-populates category and description based on selected rubroId
- Stores: 

```
{ rubroId: "GSV-REU", category: "Gestión del Servicio", description: "..."} 
```

### 1.3.3 3. Baseline Creation

**Location:** services/finanzas-api/src/handlers/baseline.ts

When user submits the Estimator:

1. Frontend sends POST to /baseline with:

```
[ { "project_name": "Project X", "labor_estimates": [ { "rubroId": "MOD-LEAD",
"role": "Ingeniero Delivery", "country": "Colombia", "level": "senior", "fte_count":
1, "hourly_rate": 6000, ... } ], "non_labor_estimates": [ { "rubroId": "GSV-REU",
"category": "Gestión del Servicio", "description": "Reuniones de seguimiento",
"amount": 1000, ... } ] }
```

2. Backend creates baseline record in prefacturas table:

- PK: PROJECT#{projectId}
- SK: BASELINE#{baselineId}
- Stores full labor\_estimates and non\_labor\_estimates arrays

3. Backend also creates metadata record:

- PK: BASELINE#{baselineId}
- SK: METADATA
- For lookup and listing

### 1.3.4 4. Handoff & Rubro Materialization

**Location:** services/finanzas-api/src/handlers/handoff.ts, services/finanzas-api/src/h

When baseline is handed off to SDMT:

1. **Handoff creates project metadata** (POST /projects/{projectId}/handoff):

- Updates projects table with baseline\_id
- Sets baseline\_status to "handed\_off" or "accepted"
- Links project to baseline for filtering

2. **Rubros are materialized** (generateLineItems() in projects.ts):

For each labor estimate:

```
[ ] { rubroId: "MOD-LEAD#base_abc123#1", // Unique SK nombre: "Ingeniero De-
delivery", category: "Labor", qty: 1, unit_cost: 7500, // monthly cost with on-costs
recurring: true, start_month: 1, end_month: 12, metadata: { source: "baseline",
baseline_id: "base_abc123", project_id: "PRJ-X", linea_codigo: "MOD-LEAD", //
CANONICAL CODE role: "Ingeniero Delivery" } }
```

For each non-labor estimate:

```
[ ] { rubroId: "GSV-REU#base_abc123#1", // Unique SK nombre: "Reuniones de
seguimiento", category: "Gestión del Servicio", qty: 1, unit_cost: 1000, recur-
ring: true, start_month: 1, end_month: 12, metadata: { source: "baseline",
baseline_id: "base_abc123", project_id: "PRJ-X", linea_codigo: "GSV-REU", //CANON-
ICAL CODE } }
```

### 3. Rubros stored in DynamoDB:

- Table: rubros
- PK: PROJECT#{projectId}
- SK: RUBRO#{canonicalCode}#{baselineId}#{index}
- **CRITICAL:** metadata.baseline\_id and metadata.linea\_codigo enable filtering

#### 1.3.5 5. SDMT Forecast Data Loading

**Location:** services/finanzas-api/src/handlers/forecast.ts, services/finanzas-api/src/

When SDMT loads forecast data:

#### 1. Query with baseline filtering (GET /plan/forecast?projectId=X):

```
[ ] const baselineRubros = await queryProjectRubros(projectId); // This function:
// 1. Gets project's active baseline_id from projects.METADATA // 2. Queries all
rubros with PK = PROJECT#{projectId} // 3. Filters by metadata.baseline_id ===
active baseline
```

#### 2. Generate forecast grid:

- For each rubro, create P/F/A cells by month
- Recurring rubros: spread across start\_month to end\_month
- One-time rubros: entire cost in start\_month
- Layer in allocations and payroll actuals

### 3. Return to frontend:

```
[ { "data": [ { "line_item_id": "MOD-LEAD#base_abc123#1", "month": 1, "planned": 7500, "forecast": 7500, "actual": 0 }, ... ], "projectId": "PRJ-X", "months": 12 }
```

## 1.4 Critical Design Decisions

### 1.4.1 Why Canonical Taxonomy?

**Problem:** Hard-coded categories and free-form strings led to: - Mismatches between Estimator and SDMT - Empty forecast data (rubros not found) - Inconsistent role/category listings - No guarantee of MOD lineage

**Solution:** Single source of truth taxonomy - Frontend uses canonical codes (MOD-LEAD, GSV-REU) - Backend stores linea\_codigo in metadata - SDMT views filter by baseline and match on linea\_codigo - Guarantees data flows from Estimator → Baseline → SDMT

### 1.4.2 Why Store linea\_codigo in metadata?

The rubrold (SK) must be unique per rubro instance: - MOD-LEAD#base\_abc123#1 - First lead engineer in baseline abc123 - MOD-LEAD#base\_abc123#2 - Second lead engineer in same baseline - MOD-LEAD#base\_xyz789#1 - First lead engineer in different baseline

But we need the **canonical taxonomy code** for: - Grouping multiple instances under same category - Matching with taxonomy definitions - Rolling up costs by linea\_codigo - Consistency across baselines

Therefore: metadata.linea\_codigo = "MOD-LEAD" preserves the canonical link.

### 1.4.3 Why Filter by baseline\_id?

Projects can have multiple baselines over time: - Initial baseline (handed off) - Revised baseline after scope change - Multiple what-if baselines

Without filtering, SDMT would show: - Rubros from all baselines mixed together - Incorrect cost totals (double/triple counting) - Wrong line items in forecast

With filtering: - Only rubros from active baseline shown - Clean handoff between baselines - Accurate cost projections

## 1.5 Data Flow Example

### 1.5.1 Step-by-step: Creating "Project Alpha"

#### 1. PMO creates estimate:

- Adds 1x "Ingeniero Delivery" (MOD-LEAD), \$6000/mo, 12 months

- Adds 2x “Ingeniero Soporte N2” (MOD-ING), \$4000/mo, 12 months
- Adds “Reuniones de seguimiento” (GSV-REU), \$1000/mo, 12 months

## 2. Submit creates baseline:

- baseline\_id: base\_e3f6647d3b01
- project\_id: PRJ-ALPHA
- labor\_estimates: [{ rubroId: "MOD-LEAD", ...}, { rubroId: "MOD-ING", ...}]
- non\_labor\_estimates: [{ rubroId: "GSV-REU", ...}]

## 3. Handoff materializes rubros:

- Rubro 1: MOD-LEAD#base\_e3f6647d3b01#1 → \$7500/mo (with on-costs)
- Rubro 2: MOD-ING#base\_e3f6647d3b01#1 → \$5000/mo
- Rubro 3: MOD-ING#base\_e3f6647d3b01#2 → \$5000/mo
- Rubro 4: GSV-REU#base\_e3f6647d3b01#1 → \$1000/mo

## 4. Project metadata updated:

```
[ ] { pk: "PROJECT#PRJ-ALPHA", sk: "METADATA", baseline_id: "base_e3f6647d3b01",
baseline_status: "handed_off" }
```

## 5. SDMT loads forecast:

- Queries rubros for PRJ-ALPHA
- Filters where metadata.baseline\_id === “base\_e3f6647d3b01”
- Returns 4 rubros × 12 months = 48 forecast cells
- Total monthly: \$18,500 (\$7500 + \$5000 + \$5000 + \$1000)

## 1.6 Testing the Lineage

### 1.6.1 Manual Verification

#### 1. Create baseline via Estimator UI

#### 2. Check prefacturas table:

```
[ ] PK: BASELINE#{baselineId} SK: METADATA // Verify labor_estimates[].rubroId
present // Verify non_labor_estimates[].rubroId present
```

#### 3. Perform handoff via API

#### 4. Check projects table:

```
[ ] PK: PROJECT#{projectId} SK: METADATA // Verify baseline_id matches
```

#### 5. Check rubros table:

```
[ ] PK: PROJECT#{projectId} SK: RUBRO#* // Verify each rubro has metadata.baseline_id
// Verify metadata.linea_codigo matches taxonomy
```

#### 6. Load forecast in SDMT UI

- Verify non-empty data
- Verify costs match estimator totals
- Verify all rubros appear

### 1.6.2 Automated Tests

**Location:** services/finanzas-api/tests/unit/

- baseline-sdm.spec.ts: Tests baseline filtering logic
- forecast.spec.ts: Tests forecast data generation
- handoff.spec.ts: Tests handoff and rubro materialization

## 1.7 Common Issues & Solutions

### 1.7.1 Issue: Forecast shows zero data

**Cause:** Rubros not filtered by baseline, or baseline\_id mismatch

**Solution:** - Verify project.baseline\_id is set during handoff - Verify each rubro has metadata.baseline\_id - Use queryProjectRubros() which filters automatically

### 1.7.2 Issue: Wrong line items in catalog

**Cause:** Rubros from multiple baselines mixed together

**Solution:** - Always filter by baseline\_id - Use filterRubrosByBaseline() helper - Check that SK starts with active baseline\_id

### 1.7.3 Issue: Estimator categories don't match SDMT

**Cause:** Hard-coded categories in Estimator not aligned with taxonomy

**Solution:** - Use useRubrosCatalog() hook in Estimator - Store canonical rubroId, not display strings - Map roles via mapModRoleToRubroId()



#### 1.7.4 Issue: Missing linea\_codigo in rubros

**Cause:** Old baseline data created before taxonomy integration

**Solution:** - Backfill metadata.linea\_codigo based on role/category patterns - Or re-handoff baseline to regenerate rubros with taxonomy

### 1.8 Future Enhancements

1. **API-based taxonomy:** Fetch rubros dynamically instead of static catalog
2. **Rubro versioning:** Support taxonomy evolution without breaking old baselines
3. **Multi-currency:** Extend lineage to handle FX conversions
4. **Indexation:** Apply CPI/min wage adjustments through lineage
5. **Audit trail:** Track changes to rubros through baseline revisions

### 1.9 References

- Rubros Taxonomy: `src/modules/rubros.taxonomia.ts`
- MOD Roles: `src/modules/modRoles.ts`
- Baseline Handler: `services/finanzas-api/src/handlers/baseline.ts`
- Handoff Handler: `services/finanzas-api/src/handlers/handoff.ts`
- Projects Handler: `services/finanzas-api/src/handlers/projects.ts`
- Forecast Handler: `services/finanzas-api/src/handlers/forecast.ts`
- Baseline-SDMT Library: `services/finanzas-api/src/lib/baseline-sdmt.ts`