# Salesforce Data Cloud – DLO, DMO, and CIO

Salesforce Data Cloud uses a **data model** built around **Data Model Objects (DMOs)**.

Within it, you'll frequently see three key object types:

| Abbreviation | Full Form | Purpose |
|---|---|---|
| **DLO** | Data Lake Object | Raw, ingested data (unprocessed) |
| **DMO** | Data Model Object | Unified, cleaned, and modelled data (structured for analytics) |
| **CIO** | Calculated Insight Object | Derived or computed metrics from DMOs (used for KPIs, insights, and activation) |

These three form the **data transformation flow** inside Salesforce Data Cloud:

**DLO → DMO → CIO → Activation/Analytics**

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## Data Lake Object (DLO)

### Definition

A **Data Lake Object (DLO)** represents **raw data** that is **ingested into Data Cloud** from external systems — such as CSV files, APIs, or data streams. It's the **landing zone** for all your source data before unification or processing.

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**Example Use Case**

**Use Case:** A retail company imports customer purchase data from POS systems. They upload a CSV file daily to Salesforce Data Cloud to populate a DLO named **"Purchase_Transactions_DLO."**

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**Sample CSV Data**

**File name:** purchase_transactions.csv

| transaction_id | customer_id | product_name | purchase_date | amount | payment_mode |
|---|---|---|---|---|---|
| T1001 | C001 | Laptop | 2025-10-10 | 850.00 | Credit Card |
| T1002 | C002 | Mobile | 2025-10-11 | 450.00 | Cash |
| T1003 | C001 | Mouse | 2025-10-12 | 25.00 | Debit Card |

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**How it Works**

- The CSV file is ingested into Salesforce Data Cloud as a **DLO**.
- DLO stores raw records *exactly* as they come from the source.
- No data cleaning or schema mapping occurs at this stage.

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**Key Characteristics**

| Property | Description |
|---|---|
| **Purpose** | Raw ingestion layer |
| **Data Source** | Files, APIs, Streams |
| **Schema** | Flat, source-specific |
| **Transformation** | None |
| **Storage** | Data Lake within Data Cloud |

| Property | Description |
| --- | --- |
| **Example Object** | Purchase_Transactions_DLO |

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# Data Model Object (DMO)

### Definition

A **Data Model Object (DMO)** is a **standardized, structured, and unified data layer**.

It's built by mapping and transforming data from DLOs (or multiple DLOs) into a **canonical Salesforce model** — e.g., *Individual, Product, Account, Transaction*.

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### Example Use Case

**Use Case:** The same retail company now wants to link customer purchases with personal details to create a unified view of each customer.

They create a DMO called **"Customer_360_DMO"** by mapping:

- Customer data from **Customer_DLO**
- Purchase data from **Purchase_Transactions_DLO**

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**Sample DMO Data**

| customer_id | customer_name | email | total_purchases | last_purchase_date | lifetime_value |
|---|---|---|---|---|---|
| C001 | John Smith | john.smith@email.com | 3 | 2025-10-12 | 875.00 |
| C002 | Mary Jones | mary.jones@email.com | 1 | 2025-10-11 | 450.00 |

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**How It Works**

- Data from Customer_DLO and Purchase_Transactions_DLO is **mapped, joined, and cleaned**.
- Identity resolution is applied to remove duplicates and merge related records.
- The result is stored as a **DMO** (structured, clean, and unified).

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**Key Characteristics**

| Property | Description |
|---|---|
| **Purpose** | Unified, clean, and structured data |
| **Data Source** | One or more DLOs |
| **Schema** | Based on Salesforce Data Model |
| **Transformation** | Mapping, cleansing, identity resolution |
| **Storage** | Data Cloud Unified Layer |
| **Example Object** | Customer_360_DMO |

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**Calculated Insight Object (CIO)**

**Definition**

A **Calculated Insight Object (CIO)** is a **derived object** used to compute metrics, KPIs, or aggregated insights from **DMOs**.

Think of it like a **view or report** built over modelled data for analytics or activation.

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**Example Use Case**

**Use Case:** The retail company now wants to analyze **average order value (AOV)** and **monthly sales trends** per customer segment.

They create a **CIO** named Sales_Insights_CIO that aggregates metrics from the Customer_360_DMO.

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**Sample CIO Data**

| month | total_sales | total_customers | avg_order_value |
|---|---|---|---|
| 2025-09 | 145,000 | 2,250 | 64.44 |
| 2025-10 | 178,500 | 2,410 | 74.08 |

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**How It Works**

- Data from Customer_360_DMO is grouped by month and aggregated.
- Computed metrics are stored in the CIO.
- CIO feeds insights into dashboards, Marketing Cloud segments, or Einstein Analytics.

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### Key Characteristics

| Property | Description |
|---|---|
| **Purpose** | Analytical, computed metrics |
| **Data Source** | DMOs |
| **Transformation** | Aggregation, calculation |
| **Storage** | Analytical Layer |
| **Example Object** | Sales_Insights_CIO |

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## End-to-End Flow Example

| Layer | Object Name | Example Data Source | Transformation | Output Example |
|---|---|---|---|---|
| **DLO** | Purchase_Transactions_DLO | POS CSV / API | Raw ingestion | 10,000 daily purchase records |
| **DMO** | Customer_360_DMO | Customer + Purchase DLOs | Unified profiles | 3,000 unique customers |
| **CIO** | Sales_Insights_CIO | Customer_360_DMO | Aggregation | Monthly sales KPI dashboard |

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# Real-World Case Study: Retail Company “ShopEase”

### Company Background

ShopEase is a growing retail chain with online and offline stores. They faced challenges due to **fragmented customer data** spread across:

- Point-of-Sale (POS)
- E-commerce website
- Email campaigns
- CRM

They implemented Salesforce Data Cloud using DLO, DMO, and CIO layers.

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### Implementation Steps

| Step | Action | Object Type | Description |
|---|---|---|---|
| 1 | Ingest raw POS and web data | DLO | Imported CSVs daily into Purchase_DLO and Customer_DLO |
| 2 | Unify customer profiles | DMO | Linked POS + web + CRM data → Customer_360_DMO |
| 3 | Create insights layer | CIO | Built KPIs like total spend, churn risk, and average order value |
| 4 | Activate | Marketing Cloud | Used CIO metrics for personalized campaigns |

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### Results (Quantitative Outcomes)

| Metric | Before | After Salesforce Data Cloud |
|---|---|---|
| Duplicate customer records | 22% | <2% |
| Campaign conversion rate | 6% | 11% |

| Metric | Before | After Salesforce Data Cloud |
|---|---|---|
| Time to prepare marketing data | 4 days | <4 hours |
| Average order value | $57 | $74 |

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**Key Learnings**

- **DLOs** simplified data ingestion from multiple sources.
- **DMOs** enabled a single customer view.
- **CIOs** delivered actionable insights that marketing teams could use immediately.
- Data Cloud eliminated the need for separate data warehouse exports.

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**Summary Table**

| Layer | Abbr. | Purpose | Data Type | Example |
|---|---|---|---|---|
| **Data Lake Object** | DLO | Raw ingestion | CSV, JSON | purchase_transactions.csv |
| **Data Model Object** | DMO | Unified, cleaned data | Structured (Customer, Product, Event) | Customer_360_DMO |
| **Calculated Insight Object** | CIO | Derived metrics | Aggregated KPIs | Sales_Insights_CIO |

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**Final Summary**

| Flow | Transformation | Output | Value |
|---|---|---|---|
| DLO → DMO | Clean, unify, enrich | Single source of truth | Accurate, deduplicated data |
| DMO → CIO | Aggregate, compute KPIs | Business insights | Real-time dashboards, personalized marketing |
| CIO → Activation | Share insights | Execution layer | Automated campaigns, sales triggers |

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**In Simple Terms**

**DLO** = Raw data

**DMO** = Unified, structured data

**CIO** = Analytical insights

Together, they form the backbone of **Salesforce Data Cloud's 360° data architecture** — turning raw data into actionable business intelligence.