**Four generic Master Data Management (MDM) architectures**

Here are the **four generic Master Data Management (MDM) architectures** as described in industry best practices (including DAMA-DMBOK v2), along with their **definitions, characteristics, and suitability in different scenarios**:

**1. Consolidation Architecture**

**Description:**

* In this architecture, master data from multiple source systems is **copied into a central repository** for reporting and analysis.
* The **source systems remain the authoritative owners** of the data and are responsible for updates.
* The central system acts primarily as a **read-only data store** — it consolidates and harmonizes data but does **not control updates**.
* Data governance is **minimal** because source systems maintain control.

**Suitable Example:**

A **retail chain** uses different sales systems in each region. They want a **centralized sales dashboard** showing customer purchases and product performance across regions.

* The central data warehouse consolidates customer and product data nightly from source systems for analytics.
* Updates (e.g., new customer registrations or product changes) are still done in regional systems.
* The data warehouse is used for **executive reporting and trend analysis**, not transaction processing.

**When to Use:**

* Early MDM adoption stage.
* Organizations focused on **analytics and reporting**, not data governance.
* Situations where source systems cannot be changed or controlled easily.

**2. Centralized Architecture**

**Description:**

* All master data is **managed and controlled centrally** in a dedicated MDM system (hub).
* Source systems become **consumers of master data** from the MDM hub.
* The MDM hub enforces **strict governance policies**, data quality, and consistency.
* Changes can only be made in the MDM hub, which propagates updates downstream.
* Typically used where **high data quality and regulatory compliance** are critical.

**Suitable Example:**

A **bank** must maintain strict control over customer identities to comply with regulations like KYC (Know Your Customer).

* Customer master data is entered and updated only in the MDM hub.
* All transactional systems (loans, deposits, credit cards) pull customer data from the hub.
* The bank enforces workflows for data changes to ensure data accuracy and auditability.

**When to Use:**

* Highly regulated industries (finance, healthcare, insurance).
* When **data quality, security, and compliance** are paramount.
* Large organizations with mature data governance.

**3. Coexistence Architecture**

**Description:**

* A hybrid model where master data can be **updated both in the MDM hub and source systems**.
* The MDM hub and source systems synchronize master data to maintain consistency.
* This architecture supports a **gradual transition** from decentralized to centralized MDM.
* Often includes conflict resolution rules and synchronization workflows.

**Suitable Example:**

A **global manufacturing company** with several legacy ERP systems and a new centralized MDM system.

* Some plants still update product data locally due to operational needs.
* The MDM hub reconciles these changes and synchronizes master data with other plants and corporate systems.
* Enables flexibility while moving towards a centralized data governance model.

**When to Use:**

* Organizations in **transition phases** adopting MDM.
* Environments where **full centralization is not immediately feasible**.
* Complex IT landscapes requiring **flexibility**.

**4. Registry-Federated Architecture**

**Description:**

* The MDM hub does **not store master data itself**, only stores references (indexes or pointers) to data in source systems.
* When master data is needed, the MDM system **federates or queries** source systems in real time.
* Data remains distributed; the MDM provides a **unified view without duplication**.
* Data governance and data quality remain largely with source systems.

**Suitable Example:**

A **healthcare network** connecting multiple hospitals and clinics.

* Each facility maintains its own patient records system.
* The MDM hub provides a **real-time, consolidated view** of a patient’s medical history across facilities.
* No data is duplicated; data access is federated on-demand.
* Enables real-time clinical decisions while preserving local control.

**When to Use:**

* Organizations requiring **real-time access** to distributed data.
* Environments where data **cannot or should not be copied** due to privacy or regulatory reasons.
* Federated organizations with autonomous business units.