

# Master Data Management

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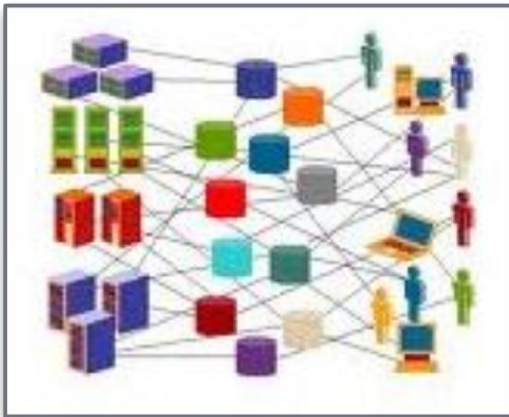
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# 1. Preference

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# A critical question arises

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How do you get from a thousand points of data entry to a single view of the business?

We are going to answer this question...

# Master Data Management (MDM) Characteristics

Master data management has two architectural components:

- The technology to profile, consolidate and synchronize the master data across the enterprise
- The applications to manage, cleanse, and enrich the structured and unstructured master data

Integrate with modern service oriented architectures (SOA)

- And bring the clean corporate master data to the applications and processes that run the business

Integrate with data warehouses and the business intelligence (BI) systems

- Bring the right information in the right form to the right person at the right time

Support data governance

- Enables orchestrated data stewardship across the enterprise

# 3. Enterprise Data

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# Enterprise Data

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Transactional  
Data

Analytical  
Data

Master Data

Metadata

# Transactional Data : OLTP

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- Significant amounts of data caused by a company's operations:
  - Sales, service, order management, manufacturing, purchasing, billing, accounts receivable and accounts payable
- The objects of the transaction are the customer and the product
- Data stores in **OnLine Transaction Processing (OLTP)** tables
- Support high volume low latency access and update
- Master data solution is called: **Operational MDM**

# Analytical Data: OLAP

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- Support a company's decision making
- Identify
  - Churn, profitability, and marketing segmentation
  - Suppliers categorization based on performance, for better supply chain decisions
  - Product behavior over long periods to identify failure patterns
- Data is stored in large data warehouses and possibly smaller data marts with table structures
- Data stores in **OnLine Analytical Processing (OLAP)** tables
- Master data solution is called: **Analytical MDM**
  - Lack the ability to influence operational systems



# Master Data: A Single Version Of The Truth

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- Master Data represents
  - Business objects that are shared across more than one transactional application
  - Key dimensions around which analytics are done
- Must support high volume transaction rates

# Introduction to Data Hub

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# Need of Data Hub

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- Point-to-points application connection and data transformation have the following issues :

needlessly replicate movement of the same data

have poor controls around them, and minimal governance

difficult to modify

poorly documented and understood

They tend to promote coupling and fusion of applications into a giant monolithic enterprise silo that is very difficult to evolve in line with business changes

They rely on the application pair involved to do things like data integration and transaction integration

# Data Hub vs. Staging Area

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- Staging area: A database that is situated between one source and one destination
- Data hub: Must have more than one source populating it, or more than one destination to which data is moved, or both multiple sources and destinations

# Six Data Hub Architecture

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**The Publish-Subscribe Data Hub**

**The Operational Data Store (ODS) for Integrated Reporting**

**The ODS for Data Warehouses**

**The Master Data Management (MDM) Hub**

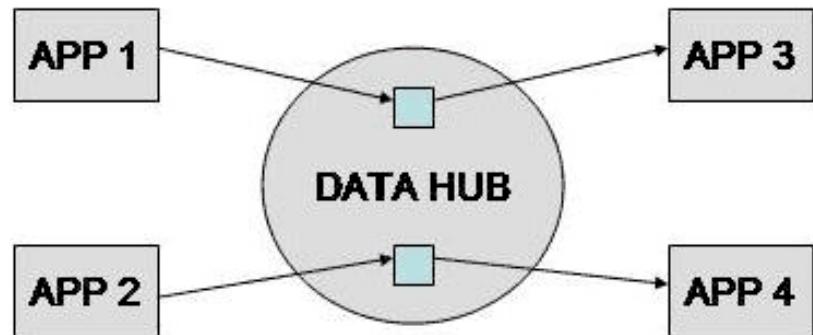
**Message Hub**

**Integration Hub**

# The Publish-Subscribe Data Hub

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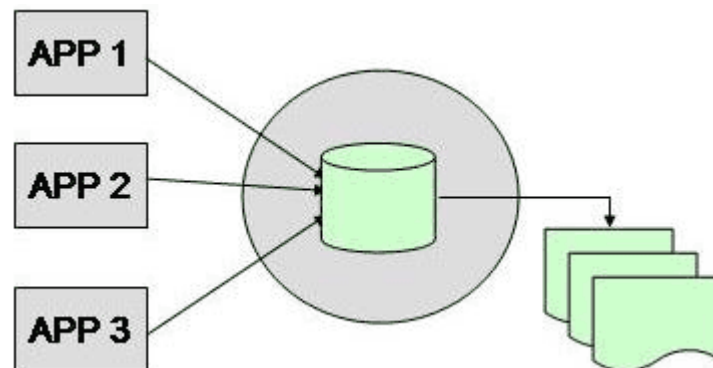
- publishers, place data they produce in the hub
- hub can “pull” the data from the publisher, or publisher can “push” the data to the hub
- subscribers take specific data sets from the hub
- the subscribers may “pull” the data out of the hub, or the hub may “push” the data to the subscribers



# Operational Data Store (ODS) for Integrated Reporting

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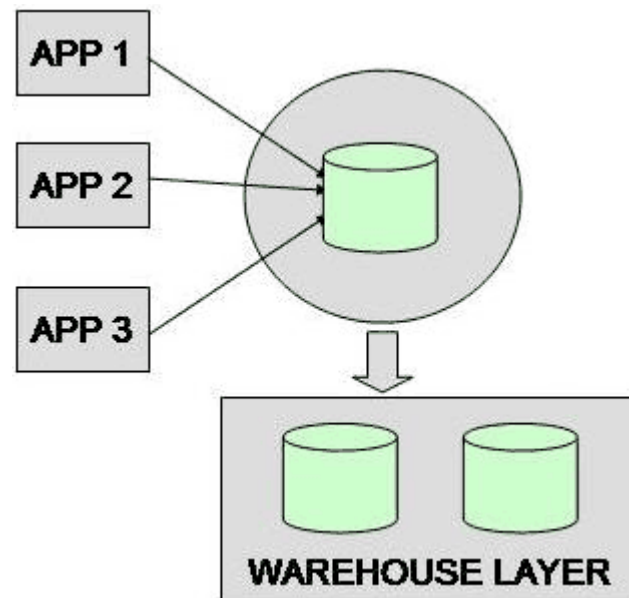
- databases of transaction applications were simply replicated and the reports run off the replicas
- So, it is realized that data from several applications could be integrated into a hub and integrated reporting run from the hub



# The ODS for Data Warehouses

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- data from many transactional applications is integrated in the hub
- further integration of data may occur in the warehouse layer

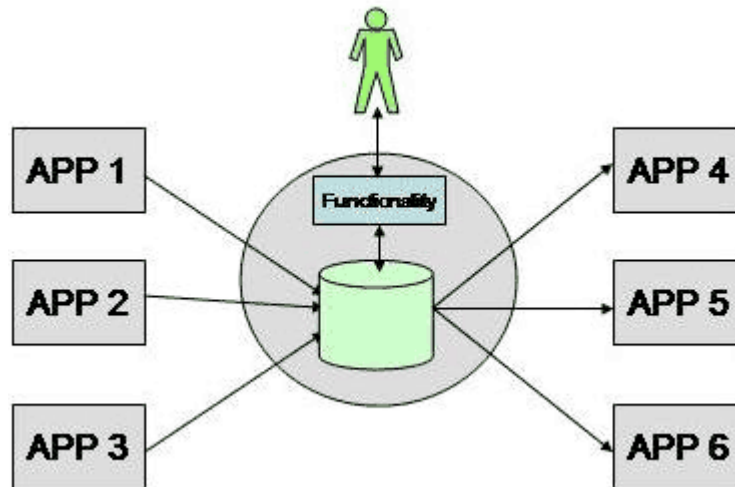




# The Master Data Management (MDM) Hub

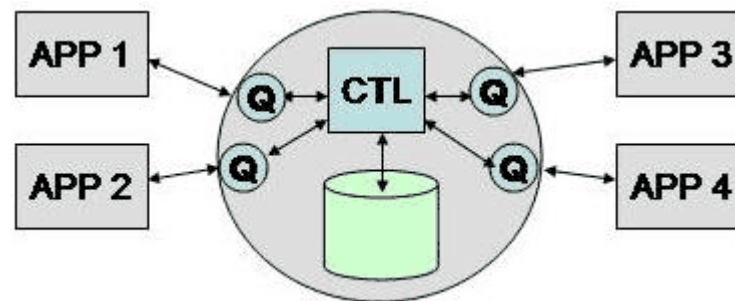
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- Integration still must happen with MDM
- content management is necessary, human operators need to analyze and update the data
- Most master data domains are too complex for automated management, and human intervention is required



# Message Hub

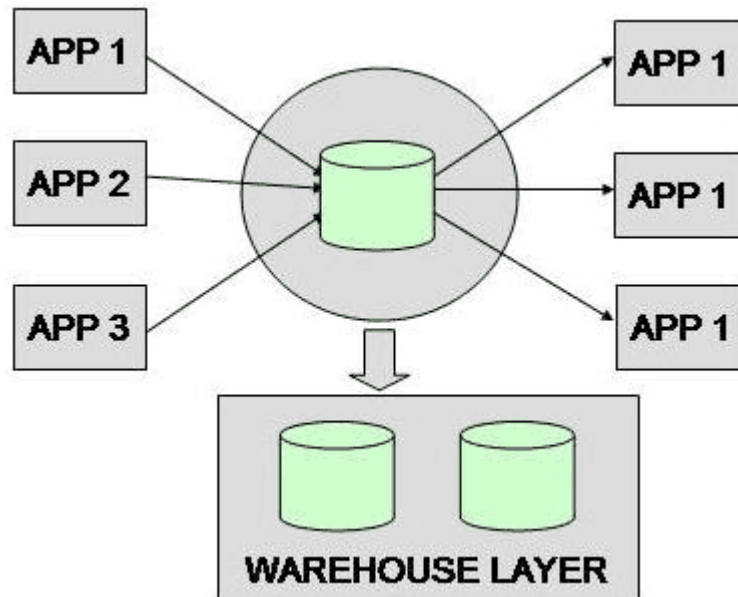
- Manages the integration of data that is contained in real time (or near-real time) messages flowing through some kind of middleware, such as enterprise service bus (ESB)



# Integration Hub

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- serves to integrate data flowing via batch movement and/or messaging





## Master Data Hub (Also called Dimensions)

# MDM Program

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# MDM Basics

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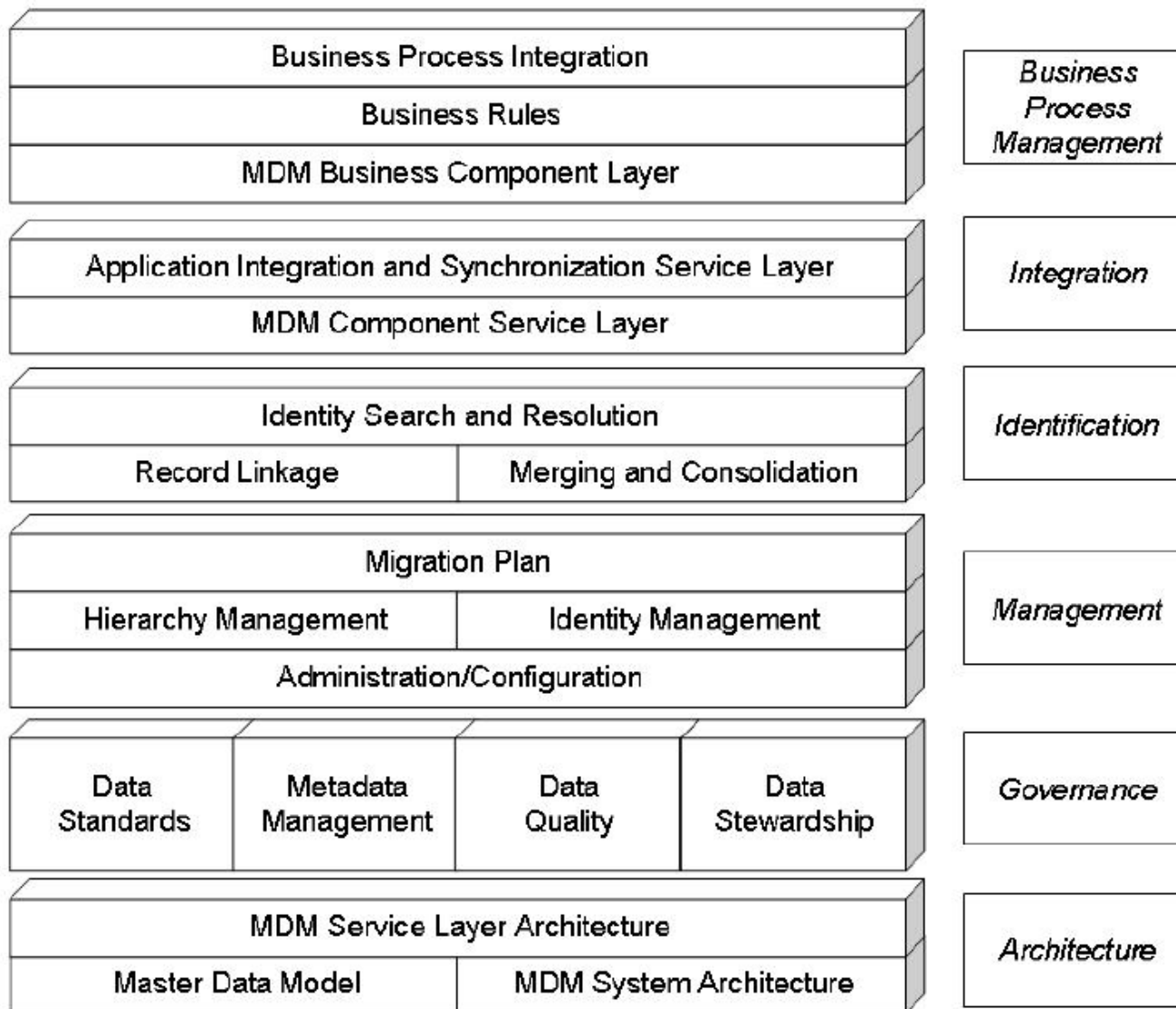
- MDM fundamentals:
  - Processes for consolidating variant version of instances of core data objects
  - Distribute across the organization
  - Into a unique representation

# MDM maturity model

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- Enterprise architects should
  - target a desired level of MDM maturity
  - develop a MDM implementation roadmap

So,  
MDM Component Layers Are Introduced In Terms  
Of Their Maturity



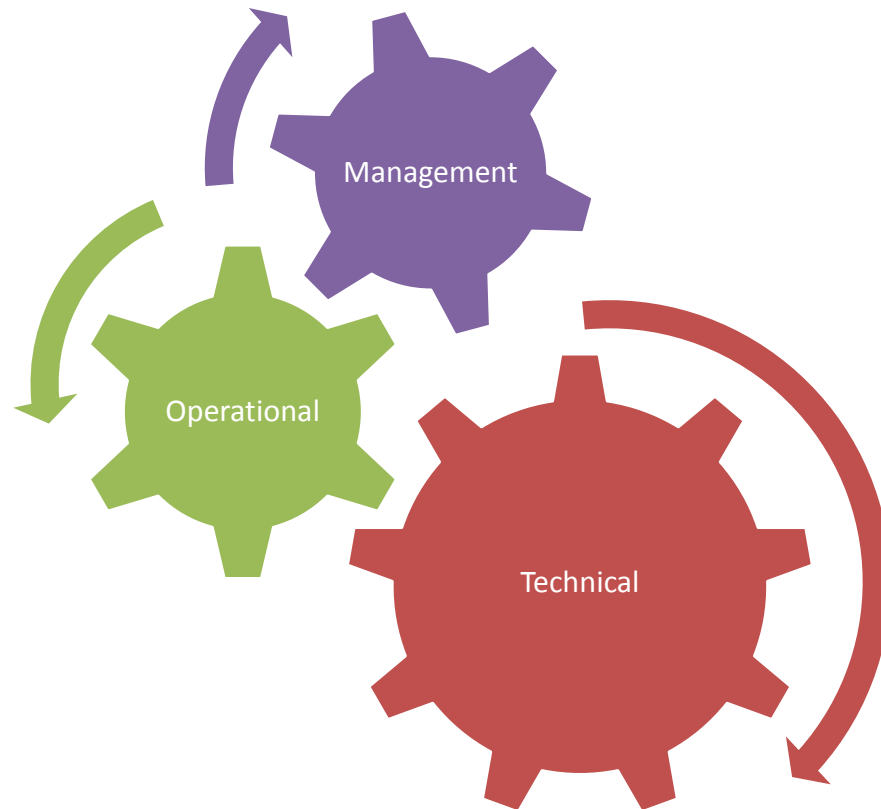
## Bottom-Up MDM Components and Service model



# MDM Components

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- Various Maturity Levels of Components to develop a roadmap



# Architecture

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- Master Data Model
  - There must be a consolidated master representation model to act as the core repository
  - A model to support all of the data in all of the application models
- MDM System Architecture
  - A set of low-level component services for Master Data Life Cycle (Create, Access, Update, Retire) of Master Data types
- MDM Service Layer Architecture
  - High-Level component service like: Synchronization, Serialization, Embedded access control, Integration, Consolidation, Access

# Governance and Oversight

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- MDM Policies to insure the access of stakeholders to information
- Standardize Definitions:
  - Assessing organizational data element information and putting them into business metadata provide standardization definition
  - Drive and control the determination of master data objects

# Governance and Oversight – cont.

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- Consolidated Metadata Management
  - Identifying and clarifying data element names, definition and other relevant attributes
  - Enterprises need to determine:
    - Business uses of each data element
    - Which data element definitions refer to the same concept
    - The applications that refer to manifestations of that concept
    - How each data element and associated concepts are created, read, modified, or retired by different applications
    - Data quality characteristics, inspection and monitoring locations within the business process flow
    - How all the uses are tied together

# Governance and Oversight – cont.

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- Data Quality
  - Impacts data quality in two ways:
    1. Unique representation for each real-world object
    2. Integration and consolidation processes for data
- Data Governance and stewardship
  - There must be some assurance of that end users will follow the rules that govern data quality

# Management

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- Identity Management:

- To ensure that:

- A record for that individual exists and that no more than one record for that individual exists, or
    - No record exists and one can be created that can be uniquely distinguishing from all other

- Hierarchy Management:

- Linage and process of resolving multiple records into a single representation

# References

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