IT Architecture

Meeting business needs.
Enabling business innovation.

Dow's Master Data Management Business Processes

Chemical Industry SAP Users Group (CISUG)

April 2006

Agenda

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- Background – Master Data Management at Dow
- Data Architecture, Strategy and Roadmap
- Master Data Management
- Data Governance

Global Codes Introduction

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Historic view on global codes in Dow

'Global codes are the key cornerstones to achieve integration of transaction systems, and enable reporting across functions and businesses.'

- **1970's and 80's:**
  Area codes (e.g. Product, Customer, Market hierarchy), supporting local / area applications

- **Late 80's - early 90's:**
  Created global codes to support SAP-R2 implementations
  Implemented global Codes Admin system (INCA) to centrally maintain and distribute codes data (globally common data segments)

- **Late 90's:**
  Further explore use of global codes in other global applications (Data Warehouse) and for other work processes, like Market/Sell, Manufacturing, etc.

Note: Reference data = Codes data = Master data

Global Codes Introduction

Global Codes Subjects implemented to-date

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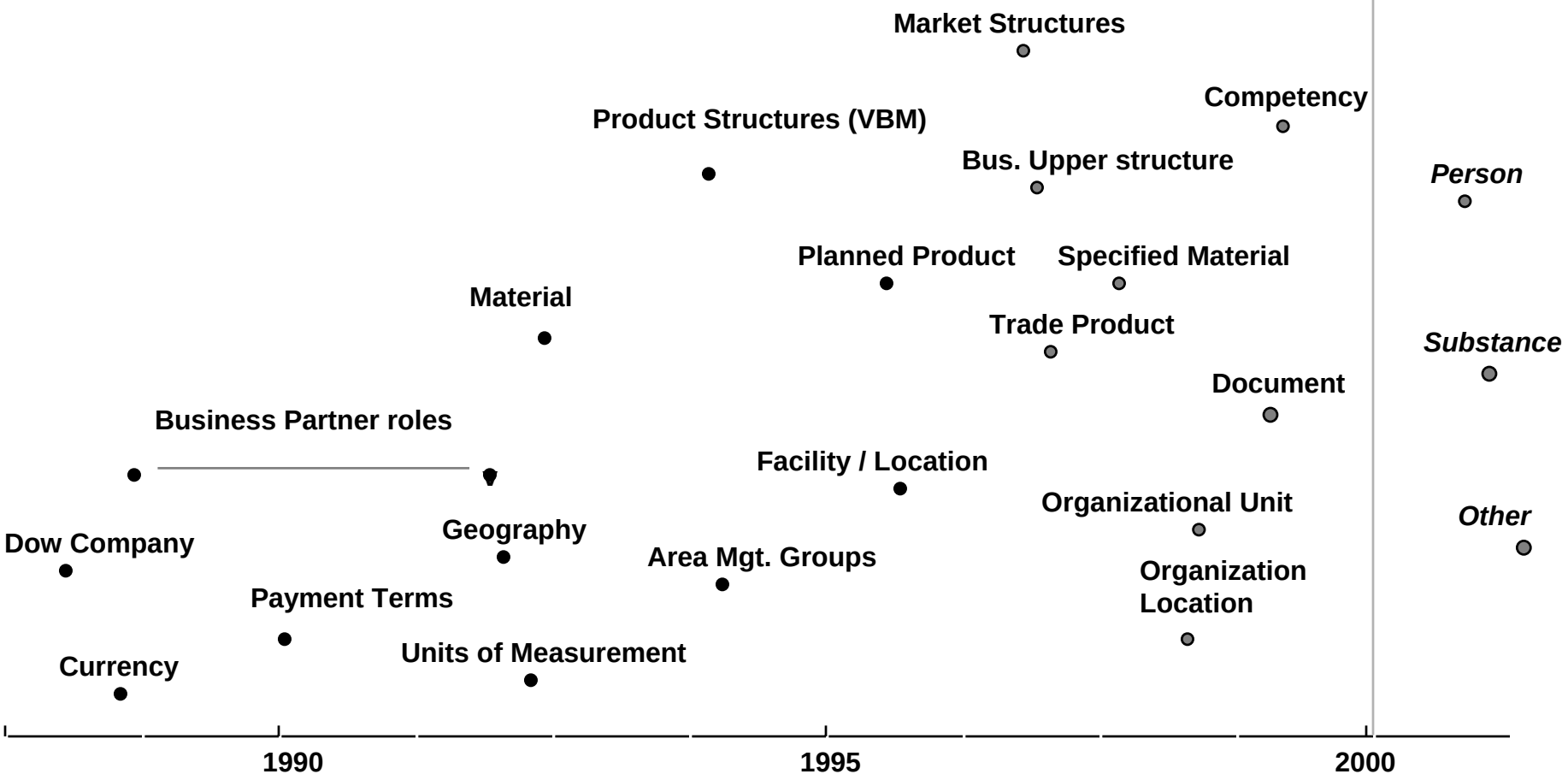

Existing Master Data Objects

- Customer
- Supplier
- Employee
- Contractor
- Global Material
- General Ledger
- Country
- Primary Geopolitical Subdivision
- Secondary Geopolitical Subdivision
- Place (City)
- Site Group
- Site
- Facility
- Area Management Group
- Area Management Group
- Language
- Substance
- Currency
- Cost Center
- Business Structure
- Industry Structure
- Work Process
- Function
- Client
- Company
- Unit of Measure
- Payment Term
- Planned Product
- Trade Product

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Data Architecture Principles

Data Principles

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Data architecture is based on a foundation of principles that ***govern*** data integration / sharing

- Shared Data is an Enterprise Resource
- Data Administration
- Data Ownership
- System of Record
- Reference Environment
- Reference Code
- Meta-data Repository
- Meta-data Content

Ensure Alignment Between Data Principles and Project Design

Shared Data Strategy

Data that spans more than one application or Dow work process **and/or** is exchanged with parties external of the enterprise

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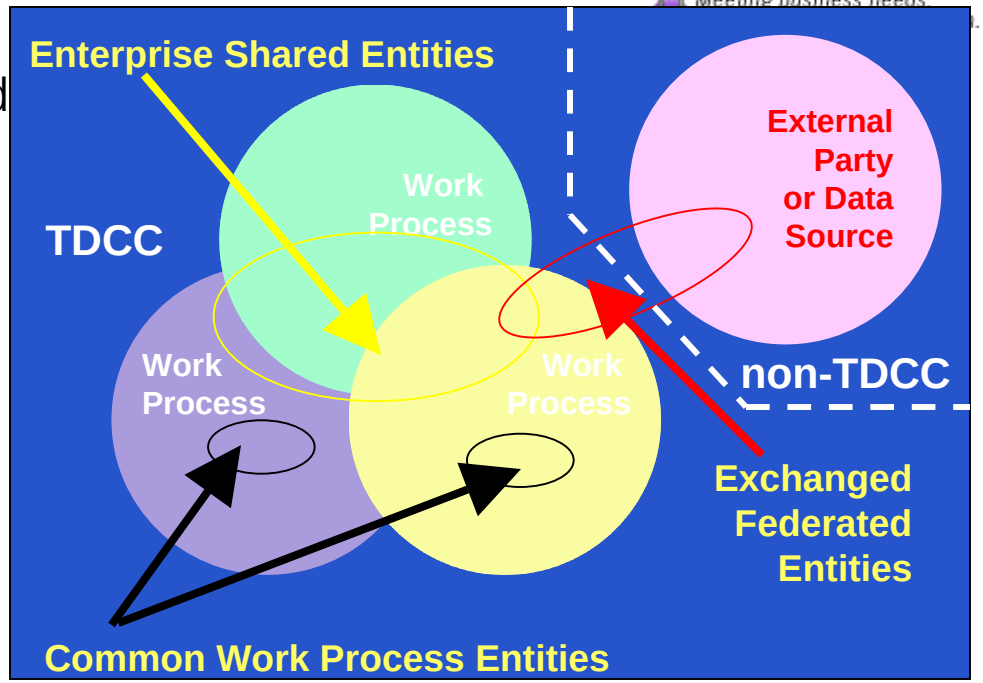
Federated– Data that is *shared/exchanged* between Dow and any *external* party

Enterprise – Data that is *shared/exchanged internally* within Dow, across *more than one Work Process*

Work process – Data that is *shared/exchanged* across more than one application *within one work process*



The goal is to document those data objects (data subjects/entities, etc.) that are both ***basic and critical*** to the business.

- By ***basic***, we mean that it is probably mentioned many times a day in normal conversation.
- By ***critical***, we mean that the business would be nonexistent, or completely different without this concept

Data Architecture Roadmap: 2015

IT Architecture

Data Architecture Vision

Best in class delivery of the right information at the right time, in the right place for the right party, to make informed and timely decisions.

Mission

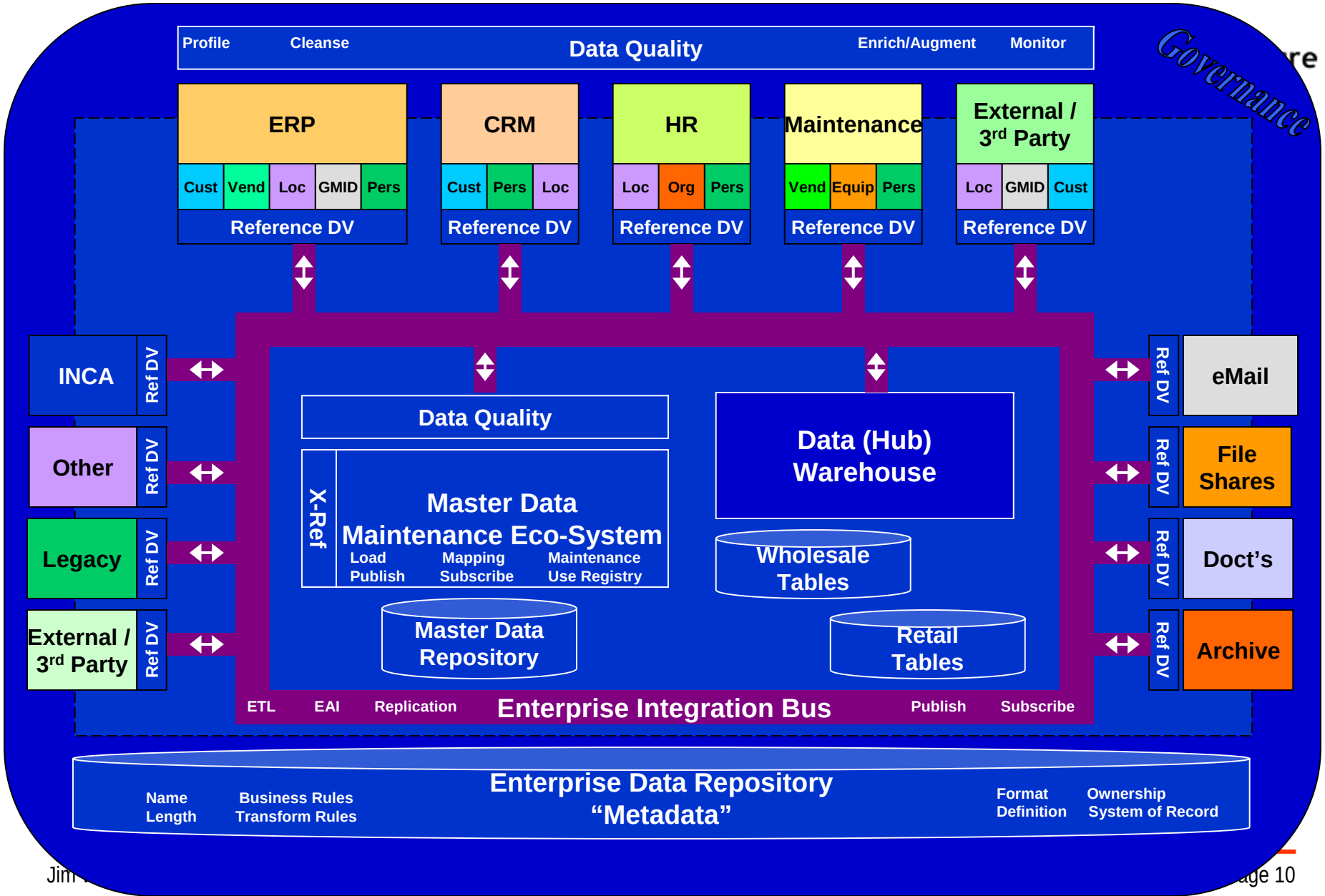
Reusable, accurate, integrated and reliable information to support business activities..

Data Architecture Elements of Solution

Governance	Information Sharing (Reuse)	Interoperability	Data Access	Data Quality	Practices & Standards
• Establish data ownership along with data stewardship roles and responsibilities to proactively manage information risk, regulatory compliance and ensure enterprise shared data is “fit for purpose”.	• Encourage the leverage and reuse of business critical data across the extended enterprise.	• Leverage service provider solutions and proactively work with partners, suppliers and standards organization to facilitate adoption of industry standards.	• Security data classifications and functional roles drive the access authorization process. Classification of data is required in order to define roles and access levels to ensure the right data to right people.	• Establish data quality measures for all business critical data assets, regardless of data type. Implement control plans to ensure the data is routinely audited and “fit for purpose”.	• Establish management practices, guidelines and standards to ensure long-term sustainability.

Data Architecture – Expanded View

Information Systems



Corporate Data Model

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World Map View: In much the same way a world map is used to show the continents, nations, bodies of water and their relationships, the corporate data model is used to show all of the concepts or subject areas of a corporation and their relationships (i.e. show the "big picture" for the enterprise).

Comprehensive: The existing CDM really represents only a Reference data (INCA) view of the enterprise. There had been no attempt to date, to document the key business transaction related data entities or relationships that the corporation depends on to operate.

End-to-End Process: Although still a work in progress, this streamlined conceptual data model depicts both the reference and transaction subject data areas, along with their key inter-relationships. Using this model, you can walk through the high level end-to-end process flows of:

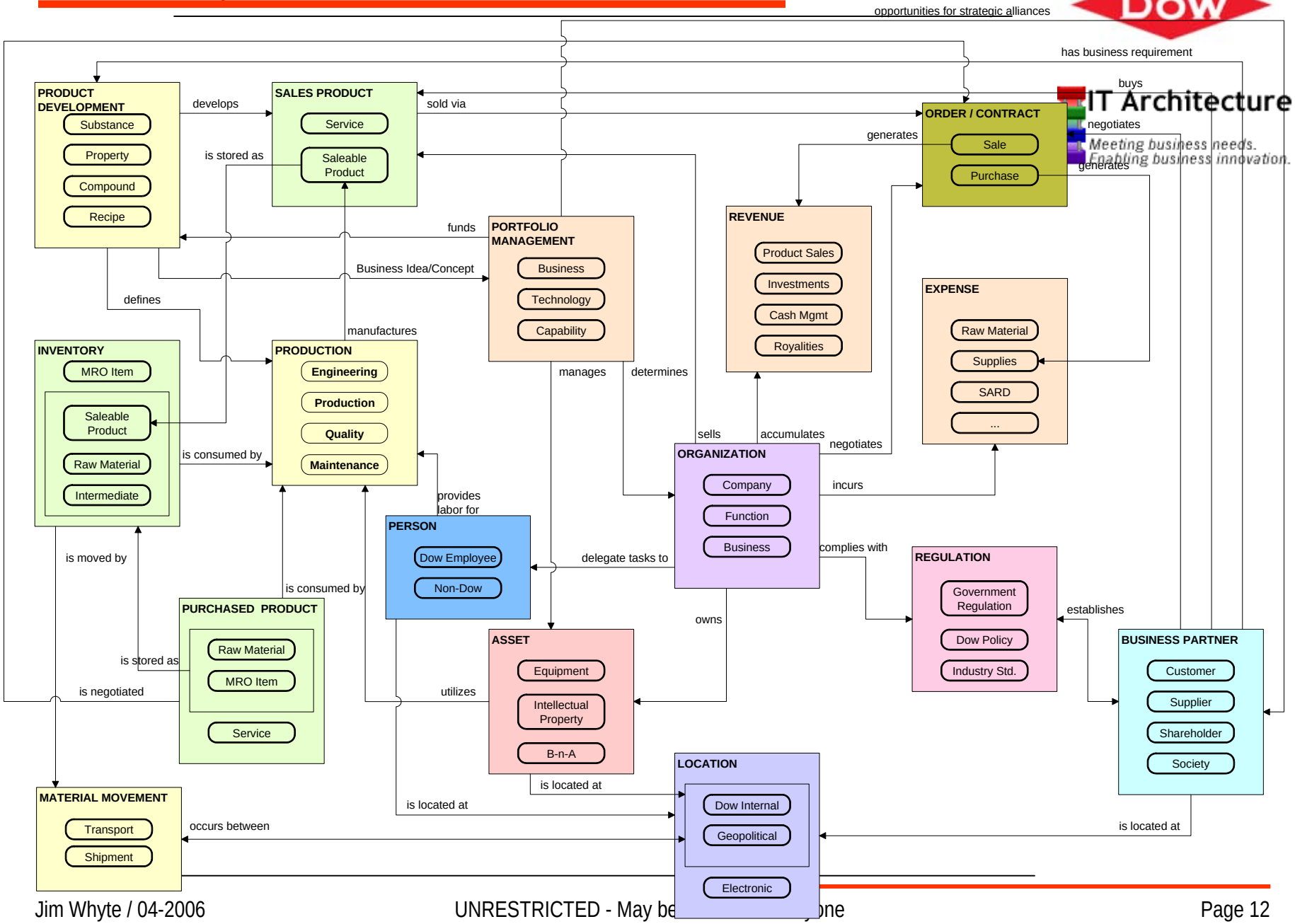
Lead
- Objective to Organization
- Capital to Competency
- Stimulus to Strategy

Manage
- Order to Cash
- Procure to Pay
- Raw Material to Finished Good
- Concept to Production
- Requirements to Resource
- Threat to Response

Use: The intended audience for this model includes: the architect team, SA's, LAS's, CMIT's and Program Managers. We can leverage this model to get agreement on the meaning of data subjects and relationships **(context)**, perform high-level impact analysis, project scoping and opportunities for data reuse **(planning)**, to resolve name and definition clashes and relationship conflicts **(issue resolution)**.

Corporate Data Model

Information Systems



Data Architecture

What are we trying to manage? Layered Data Hierarchy

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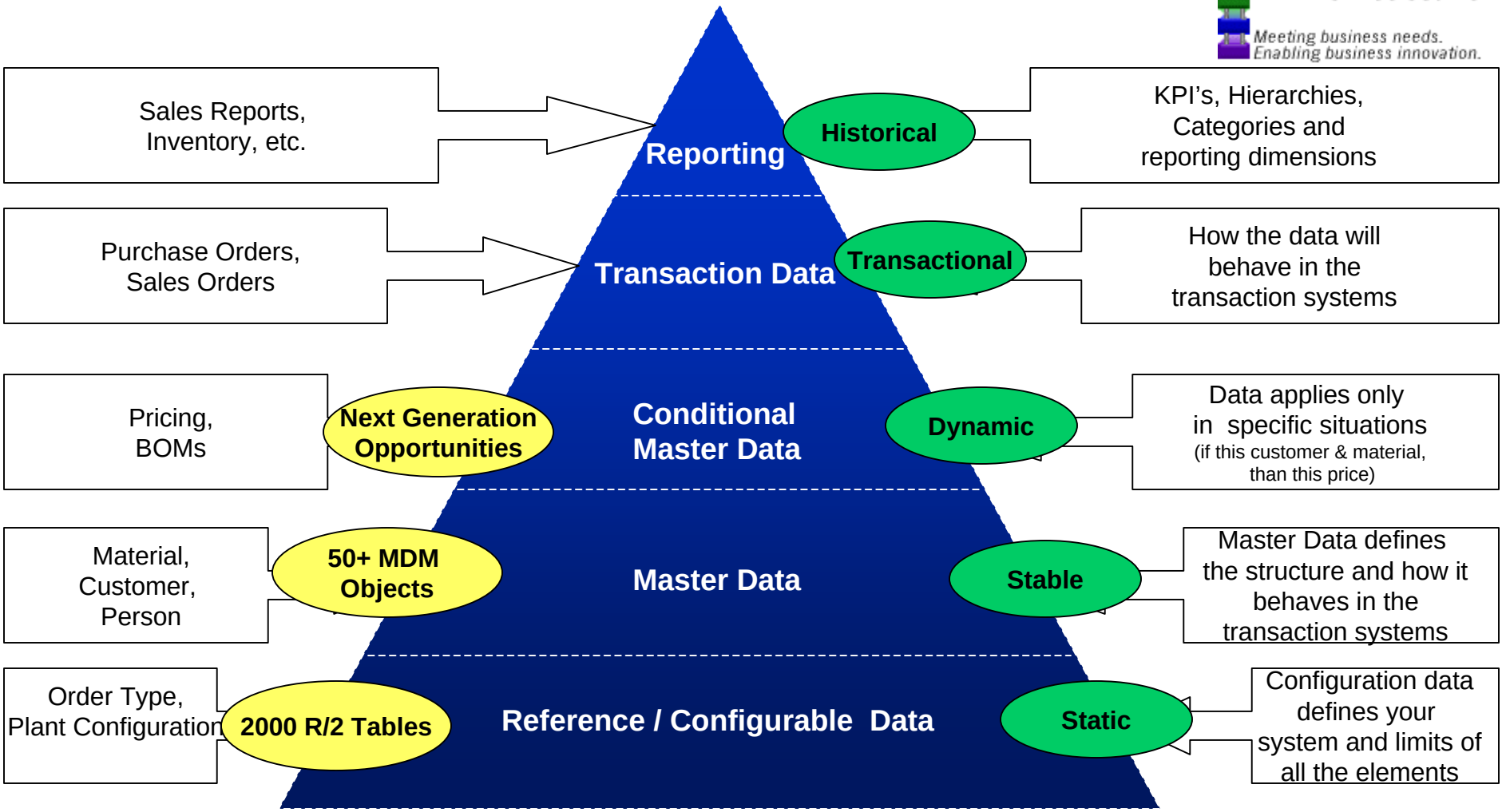

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Master Data Management

Master Data Management

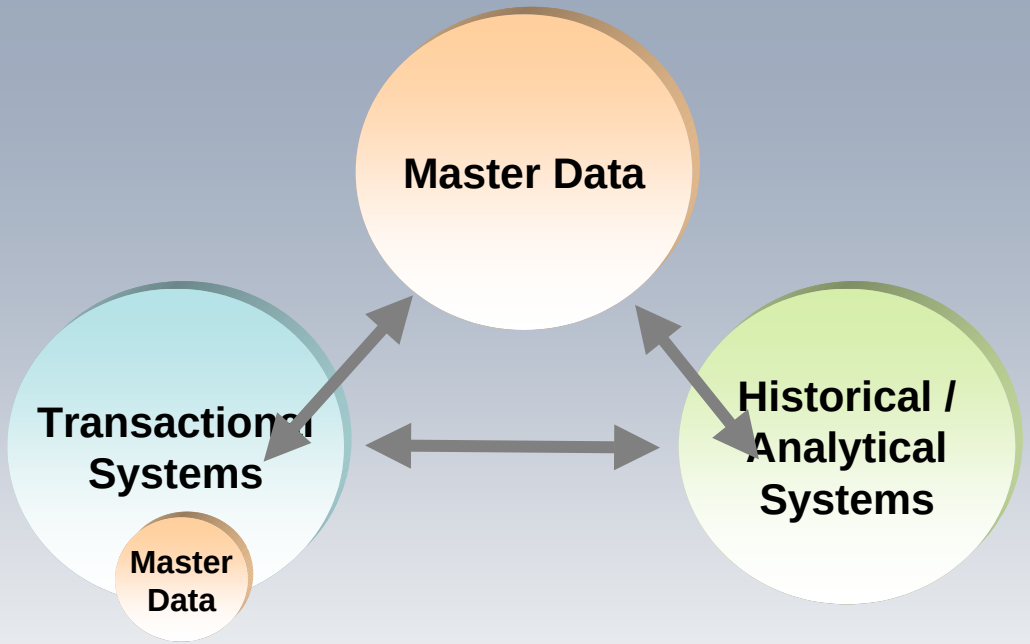
A Core Control Point for Data Integration

IT Architecture

Decouple master information

Master Data Management is a set of disciplines, technologies, and solutions used to create and maintain consistent, complete, contextual and accurate business data for all stakeholders (users, and applications) across and beyond the enterprise

warehouse



For All Types of Master Data

…products, organizations, locations, trading partners, employees, customers, equipment, assets, accounts, policies…

Reference: IBM SOA and MDM Overview – 01/2006

Review of MDM definition / objectives

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- **Master Data Management (MDM)** is both a business strategy and a technical solution.
- Master Data Management includes the:

• People/organization • Processes and	80%
• Technology	20%

used to administer and govern reference data shared and exchanged across the extended enterprise.

- A Master Data Management strategy and solution are critical to managing corporate information in a consistent, controlled, and “single-view” capable manner.

MDM Components

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- People / Organization
  - Data Ownership, stewardship, roles and responsibilities
- Process
  - Create, Update, Discontinue, Outsee, Archive, Purge
- Technology
  1. Code Maintenance (supporting Dow business requirements)
  2. Data Quality (profile, analyze (gaps), cleanse and monitor)
  3. Data Integration (load, distribute, replicate and retrieve)
  4. Metadata (business and technical documentation)

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What is a Global Code?

- Globally common master / reference data
  - Customer, Supplier, Material, Product Hierarchy…
- Globally common attributes
  - Customer: Name, Address, Corporate HQ…
  - Material: Name, Characteristics, Class, UofM…
- Application agnostic
- Identical for every legal and business entity
- Enterprise KPI's / reporting dimensions

Administered on a global basis

MDM Strategic Direction - Summary

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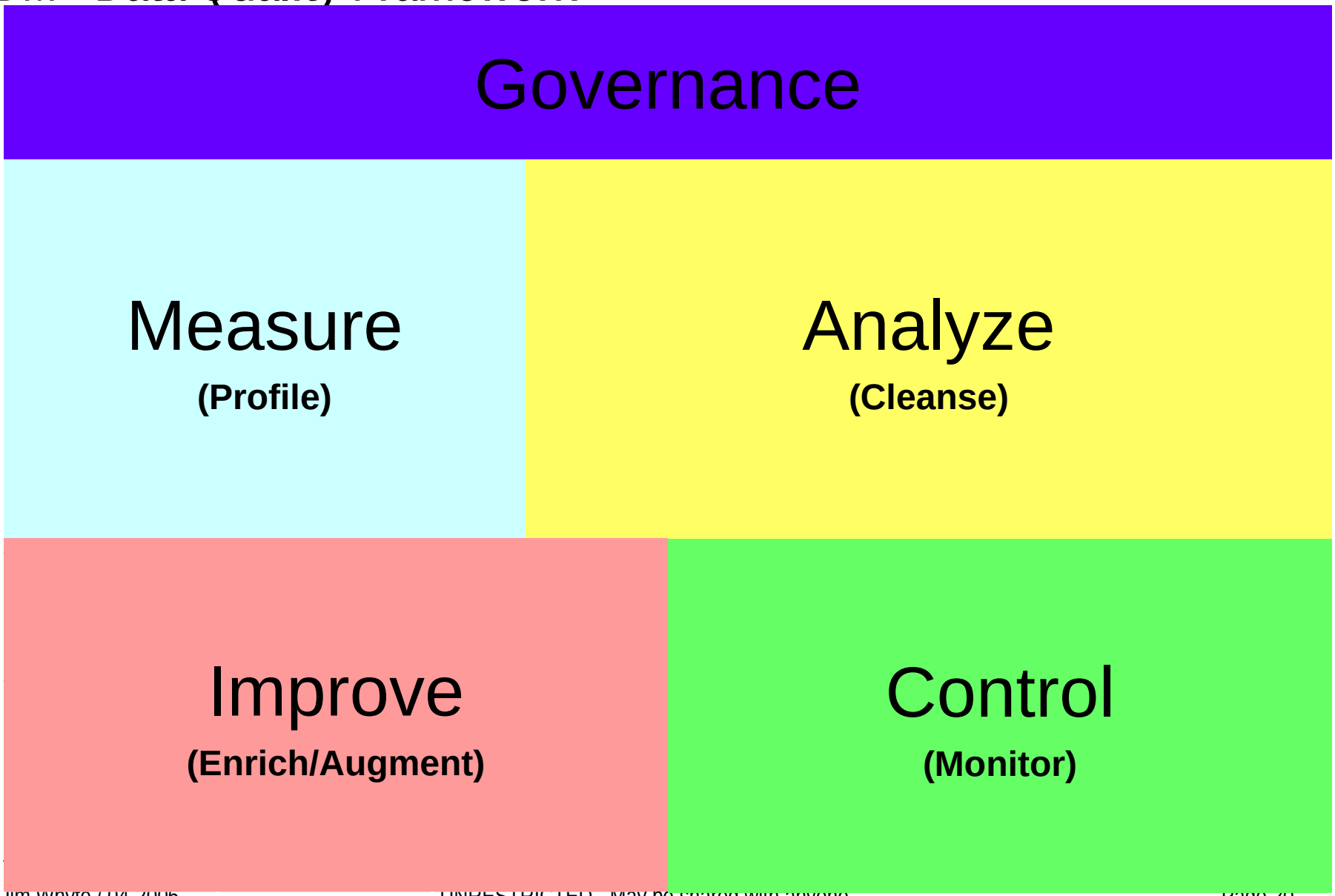
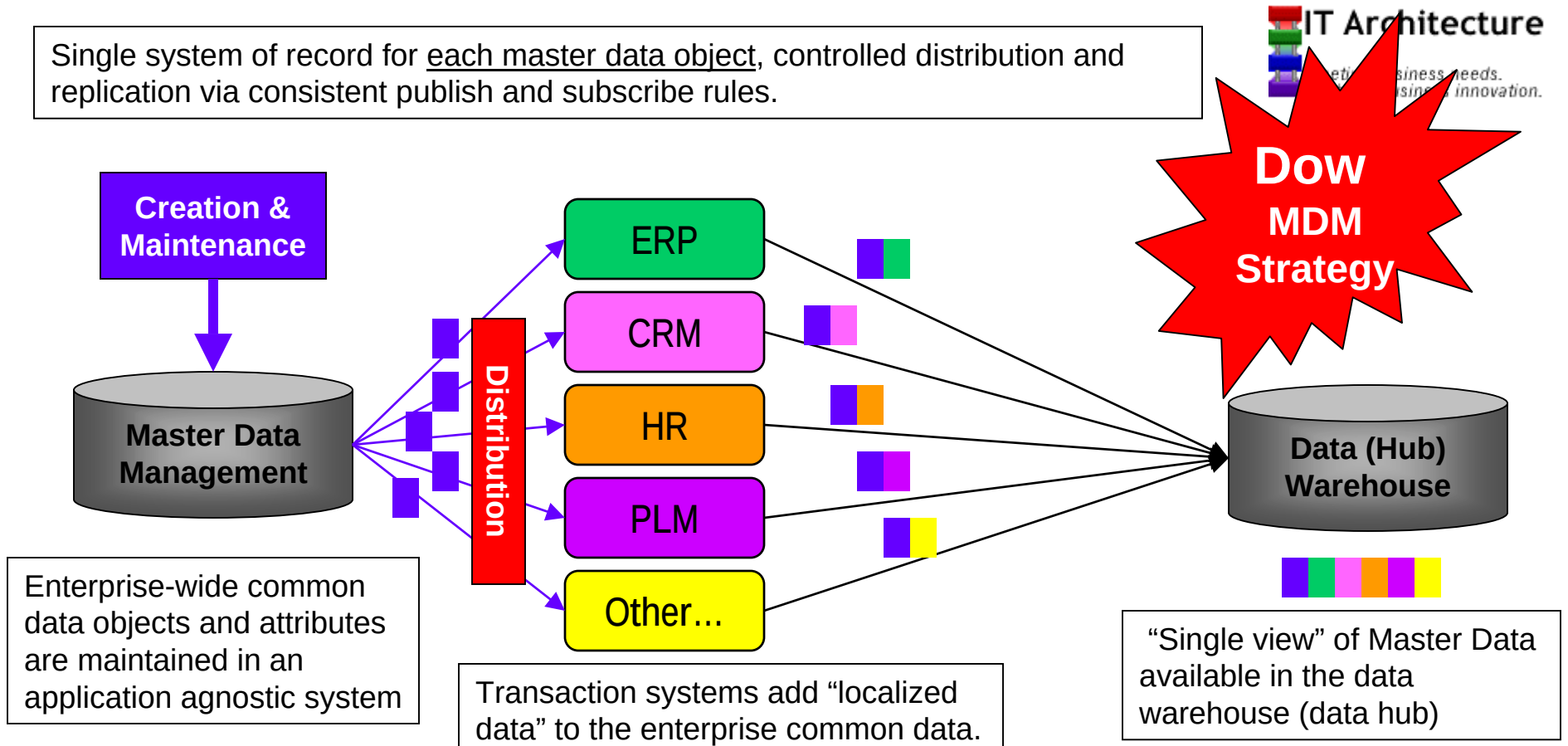
- Master/reference Data (*Enterprise Shared Data*) is application agnostic
- Principle of "*One*":
  - » Single *system of record* for each data object
  - » Single *data owner* for each data object
  - » Single, *unique code* for each data object instance
  - » Single *system of reference*, providing a *single view* of each data instance for the enterprise (data hub)
  - » Single *data definition* - values represent the same meaning across all systems and files
  - » Single *data format* (data standard) for each data object
  - » Data flows in a *single direction*, from data source to the system of reference
- Consistent:
  - » operating discipline (GCEC Best Practices)
  - » tools (maintenance, DQ/Cleansing, Distribution, Replication)
  - » process (maintenance, distribution, replication, audit trail, ILC mgmt)
  - » data content across:
    - Legal Entities, Work Processes, Applications, Instances, Clients, Companies, Plants,
- Data is *optimized for data consumption* vs. data capture
  - » Presentation of information for Legal / regulatory requirements takes precedence over Dow management requirements

MDM - Data Quality Framework



Strategy: Dominant Master Data Source

Single system of record for <u>each master data object</u>, controlled distribution and replication via consistent publish and subscribe rules.



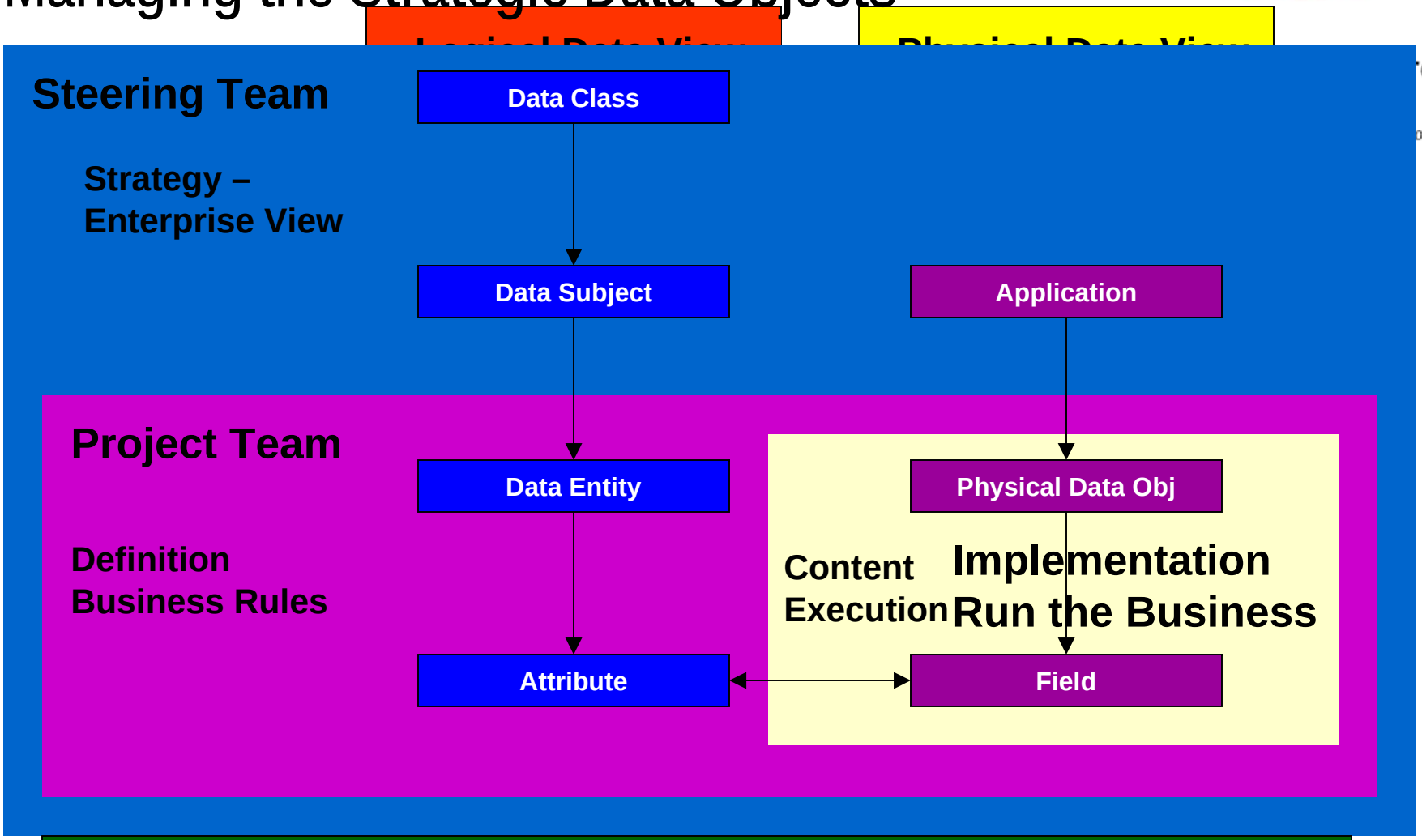
Enterprise-wide common data objects and attributes are maintained in an application agnostic system

Transaction systems add “localized data” to the enterprise common data.

Transaction systems can be the system of record for unique master data.

“Single view” of Master Data available in the data warehouse (data hub)

Managing the Strategic Data Objects



GCEC MET and Best Practices

Governance | Leverage/Reuse | Interoperability | Data Access | Data Quality | Practices & Stds

TA 3.0 Framework

Candidate New Master Data Objects

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- Person
- Equipment
- MRO Commodity (Catalog Items)
- Equipment Groups
- Equipment Specification
- Parts Management
- Manufacturers
- Parts
- Warehouse
- Warehouse Item
- Hierarchies, Reporting Structures
- User
- Building
- Region / Territory
- Substance
- Container
- Transportation Type
- Organization
- Contact Mechanism
- SAP Organizational Structure
- New mySAP tables & Objects
- Others…TBD

Data Stewardship Roles & Responsibilities

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Technology

"X-Work Process alignment"

Strategy / Corp view

People & Process

"Work Process Aligned"

Definition / Rules

"Business and Shared Service Aligned"

Content / Execution

Data Stewardship Steering Team

Project Team

Data Producers

Input of data in accordance with rules; front-line accountability for data quality

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Master Data Governance

- Global Codes Expertise Center

Global Codes Expertise Center

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The Global Codes Expertise Center provides vision, direction, technology and support services needed to continuously improve the quality of Master Data. We also promote the integration of Master Data across Dow's business systems and work processes to reduce operating costs and maximize data value.

The key objectives for the Global Codes activities includes:

- *Create a model for staffing codes projects*
- *Establish well-defined roles and responsibilities*
- *Eliminate rework*
- *Standardize tools, policies and processes*
- *Reduce number of handoffs*
- *Improve timeliness and quality of decision-making*
- *Continue to improve codes process*
- *Key enabler for implementing in half-the-time, twice the volume, with equal quality*

Global Codes Functional Areas & Sub-Processes

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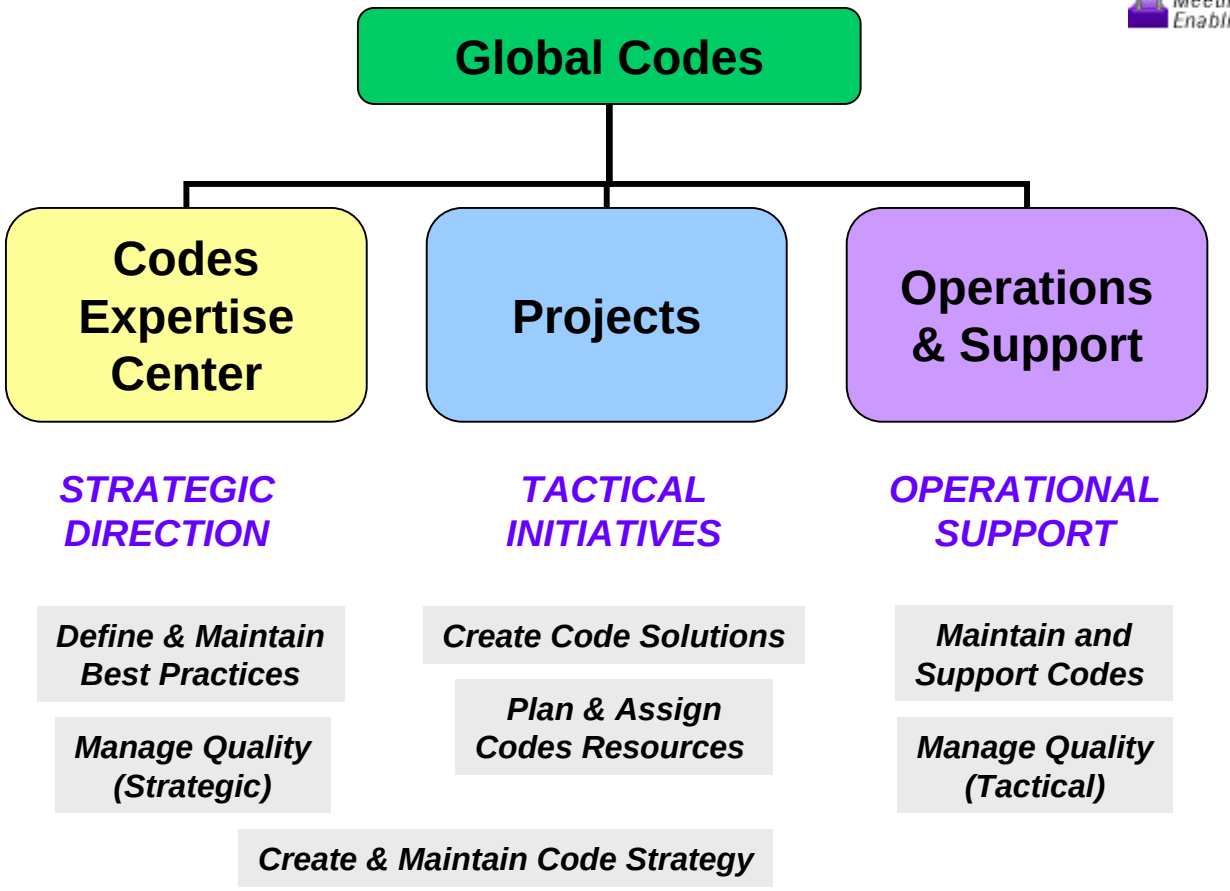

Ownership versus Management of Data Subjects

Ownership	Supply Chain	Commercial	Procurement	Quality	Finance	Manufacturing
Codes (Master Data)	Material Upper Structure Geo C&D Bom's Routings Freight Rates	Customer Contacts Field Seller and Industry Assignments	Vendor MRO Materials	SMC Titles	Liable Customer Cost Center World Area Currency Company	Facility Site Site Group

Manage Life Cycle

Implement, Support, Design, Technology, Systems, Improvement, Work Process MET, Training, Data Maintenance, Metrics, Monitoring

Master Data Management - Data Ownership

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Procurement

Raw Materials, Packaging Materials, Vendor, Equipment, Spares, Capital, MRO – Contracts, Leases, Land,

Supply Chain

Commercial Materials, Geopolitical, Unit of Measure, Plan Level Data, BOM,s Routings, Freight Rates,

Record and Report

Business Upper structure, Plan Product, Company, Cost Center, Currency, Liable Customer, Payment Terms, Area Management Group…

EH&S

Substance, Hazardous Materials

Quality

Specified Material, Title

Market / Sell

Customer, Trade Product, Field Seller Assignments, Industry Assignments

Manufacturing

Facility, Site, Site Group

Human Resources

Employee Number

Develop & Commercialize Technology

Research & Development Material Coding

MDM Styles to be Considered

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