

The Information Modeling Handbook – It's More than Data Modeling

Enterprise Architecture Open House

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Session 5C



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Session Overview and Agenda

- **Part 1: Business Value of Information Architecture**
- **Part 2: Information Modeling Standard**
 - Information & Data Modeling in the OPS
 - Enterprise Information Architecture Reference Models
 - GO-ITS 56.0 Information Modeling Standard
- **Part 3: Cluster Experience and Lessons Learned**



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Part 1: Business Value of Information Architecture



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Data vs. Information

- **Data** is a raw value; it gains meaning when put in a business context.

For example, 28 is a number. It can represent a person's age, a house number on the street, the floor level or a unit number in a build, etc.

- **Information** is any representation of knowledge such as facts, events, things, processes, ideas or opinions that have a particular meaning within a certain context (reports, graphs, charts, maps, etc.).
- The **information** needed to support the business is based on the **data** stored in operational data stores.



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What is Information Architecture (IA)?

- **Description:**

- The discipline of defining the things of interest to an organization
- The understanding of information requirements that support business activities (processes)

- **Provides a foundation for:**

- Identifying and confirming key business concepts and information and the underlying business rules;
- Identifying opportunities to share and / or integrate information;
- Enabling information exchange between people and IT solutions;
- Increasing data consistency and accuracy and reducing data redundancy.



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What is Data Architecture?

- **Description:**

- The discipline of defining data and describing how data is processed and stored to support the business needs within an organization.

- **Data Architecture**

- Represented by data models (diagrams & metadata) that define and describe the business data requirements.
- Deals with the technology constraints when implementing database solutions for the business data requirements.



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Business Value of IA

- **Key business values of IA include:**
 - Helps manage complexity and risk;
 - Supports standardization;
 - Supports business integration;
 - Helps manage interoperability.



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Business Value of IA (cont'd)

- **Helps Manage Complexity and Risk**

- Provides a consistent way of organizing and summarizing information;
- Provides clarity for identifying business requirements – *the data model helps to visually depict the information within scope*;
- Enables better planning and informed decision-making.

- **Supports Standardization**

- Provides a common definition for information – *essential starting point to support IT and business alignment*;
- Provides a way of defining a single source of information (authoritative) – *avoiding data duplication and enabling reuse*;
- Aligns with enterprise information architecture – *makes use of reference models*;
- Compliant with Ministry, IT Cluster and OPS standards.



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Business Value of IA (cont'd)

Supports Business Integration

- Enables the integration and exchange of information – *data is defined consistently across the organization enabling reuse;*
- Reduces the cost of re-work – *leverages existing data models.*

Helps Manage Interoperability

- Provides a way of defining the structure of commonly used data;
- Enables the alignment of data structures across business solutions;
- Provides the ability to rationalize data.



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Part 2: Information Modeling Standard



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Information Modeling and Data Modeling

| | Information Modeling | Data Modeling |
|-----------------------|--|---|
| What it is | Defines data / information objects, facts, and rules to help organization do business effectively | Identifies things (entities) of importance for an organization, the properties (attributes) of those things and how the things are related to each other (relationships). |
| Purposes | <ol style="list-style-type: none"> 1. Define business data / information needs 2. Define business data / information independent of technology 3. Support database, registry and repository design 4. Provide the basis for data / information sharing and integration | <ol style="list-style-type: none"> 1. Identify, define and present data requirements 2. Describe the data components in the implementation of technology solutions 3. Illustrate the traceability from the business data requirements to database solutions 4. Verify that the business needs have been met |
| Model Elements | <ul style="list-style-type: none"> • Information Entities (processes, data, rules, etc.) • Entity Attributes • Relationships (data relationships, information and process flows) • Diagram(s) and Data Dictionary | <ul style="list-style-type: none"> • Data Entities • Entity Attributes • Relationships • Diagram(s) and Data Dictionary |



Data Modeling Challenges in the OPS

- Multiple approaches used across the OPS to develop data models.
- Different formats and notations used in the data models.
- Different ways used to classify, define, or describe a data model.
- Internal resources or external consultant resources introduce / apply their own approaches, use their data own data modeling formats, notations, and definitions.
- General misunderstanding of the business semantics presented in data models.

Opportunities:

- ✓ Data modeling standards and rules must be defined to enable consistency in modeling information and high model quality.
- ✓ Enterprise reference models should be used to promote common and shared data definitions and naming standards.



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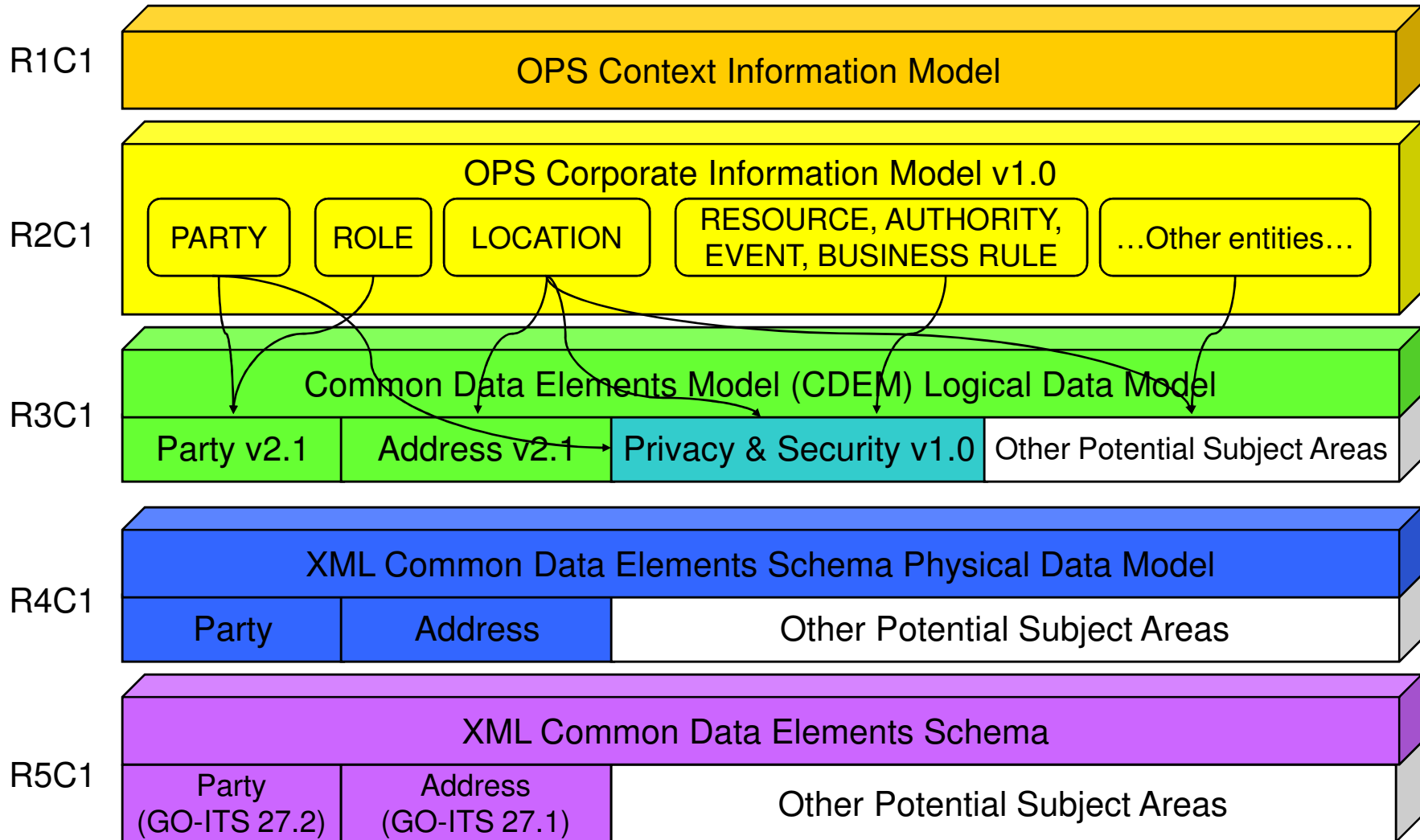
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Enterprise Information Architecture Reference Models



Information Modeling Handbook (IMH)

- Version 1.0 was released in August 2002
- Further refined to better align with industry standards and best practices (version 4.0 May 2007)
- Approved by the IT Standards Council (ITSC) and effective as an IT standard (GO-ITS 56.0 Information Modeling Standard) February 2008
 - To standardize data / information modeling practices;
 - All OPS I&IT projects must follow the Information Modeling Standard when defining, describing, and developing data models;
 - Standard is publicly available and required for project resources to apply (i.e. staff and vendor resources).



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GO-ITS 56.0 IMH Summary

- IMH includes the following components:
 - Data model types:
 - Conceptual data model (Chapter 2)
 - Logical data model (Chapter 2)
 - Physical data model (Chapter 2)
 - Dimensional models (Chapter 3)
 - XML schema (Chapter 4)
 - Data naming standards (Chapter 5)
 - Data modeling notations (Chapter 2)
 - Quality assurance guidelines (Chapter 6)
 - Quality assurance review checklists (Appendix D)



Data Model Definitions

Conceptual Data Model

- A representation of the **key** in-scope business entities and their relationships.
- It identifies the data needed to support business processes and functions.
- It focuses on the key entities that have a business meaning, the important relationships among these entities and the representative attributes of the entities.

Logical Data Model

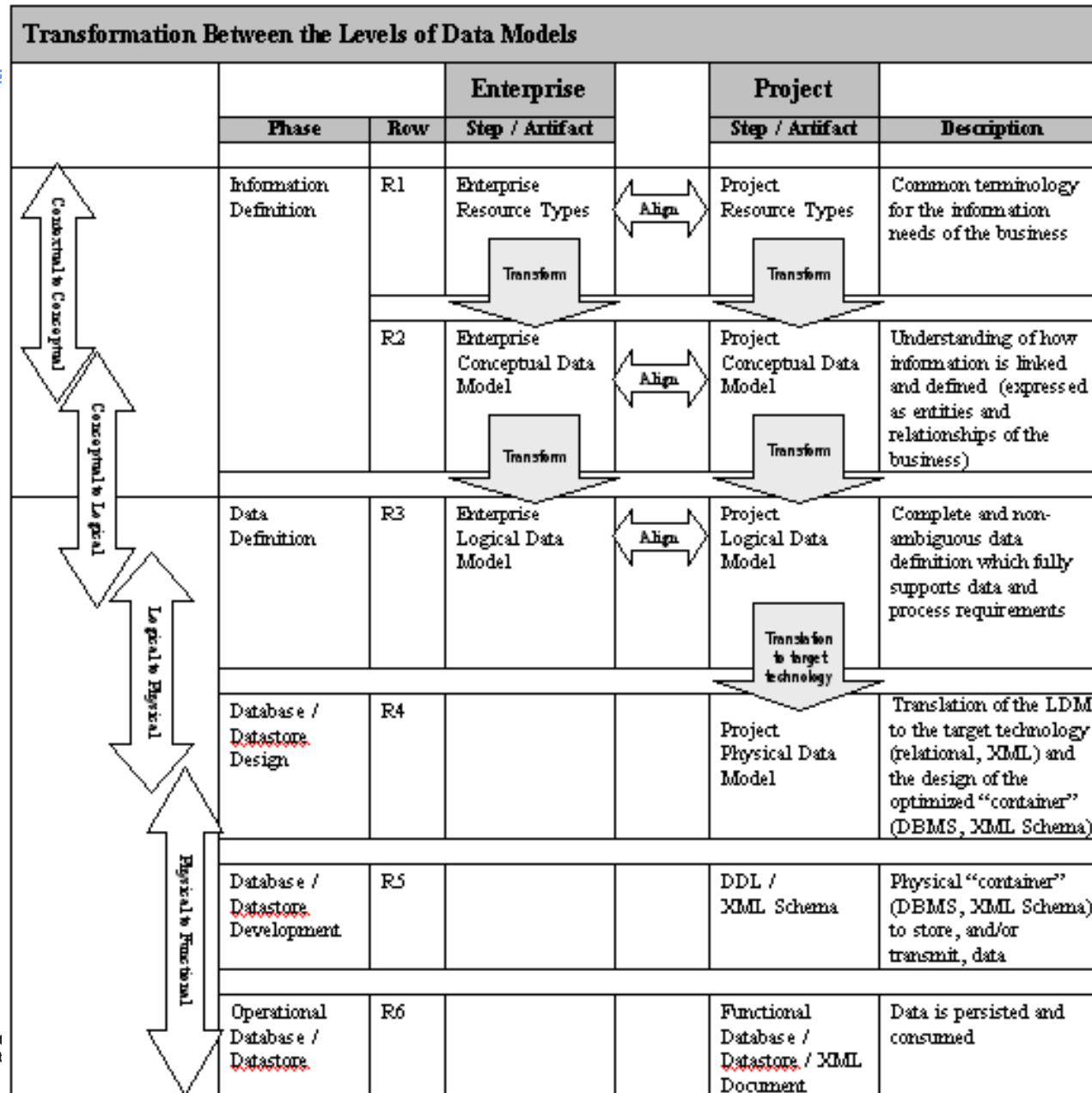
- A representation of **all** the in-scope business entities, their relationships and their attributes.
- It describes the data requirements and needs in support of the in scope business activities in as much detail as possible without any consideration of the physical implementation environment or of performance considerations.

Physical Data Model

- A representation of the physical implementation of the logical data requirements using a particular technology within the intended implementation platform and environment.
- It is primarily concerned with physical limitations, performance and space requirements.



Data Model Transformation & Alignment



Part 3: Cluster Experience & Lessons Learned



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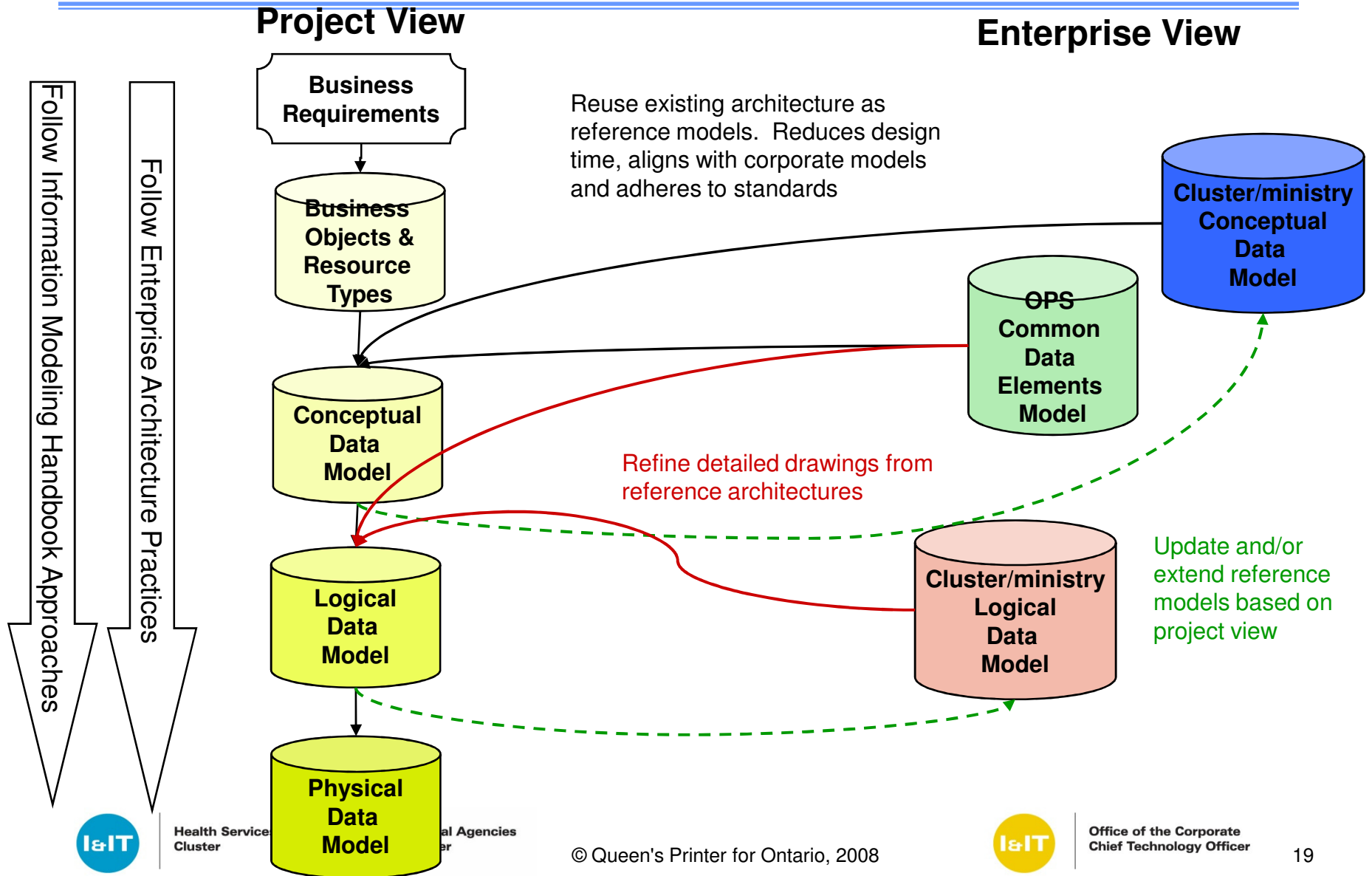
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Data Architecture Development Process



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- Incorporated Enterprise Architecture approach in delivering a multi-year multi-million dollar project - Modernizing Ontario System of Tax Administration (MOST).



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MOST - Roadmap



The exciting journey ahead...
to one integrated system for tax administration services.



We are efficient. We are innovative. We are responsive. We are ONT-TAXS!



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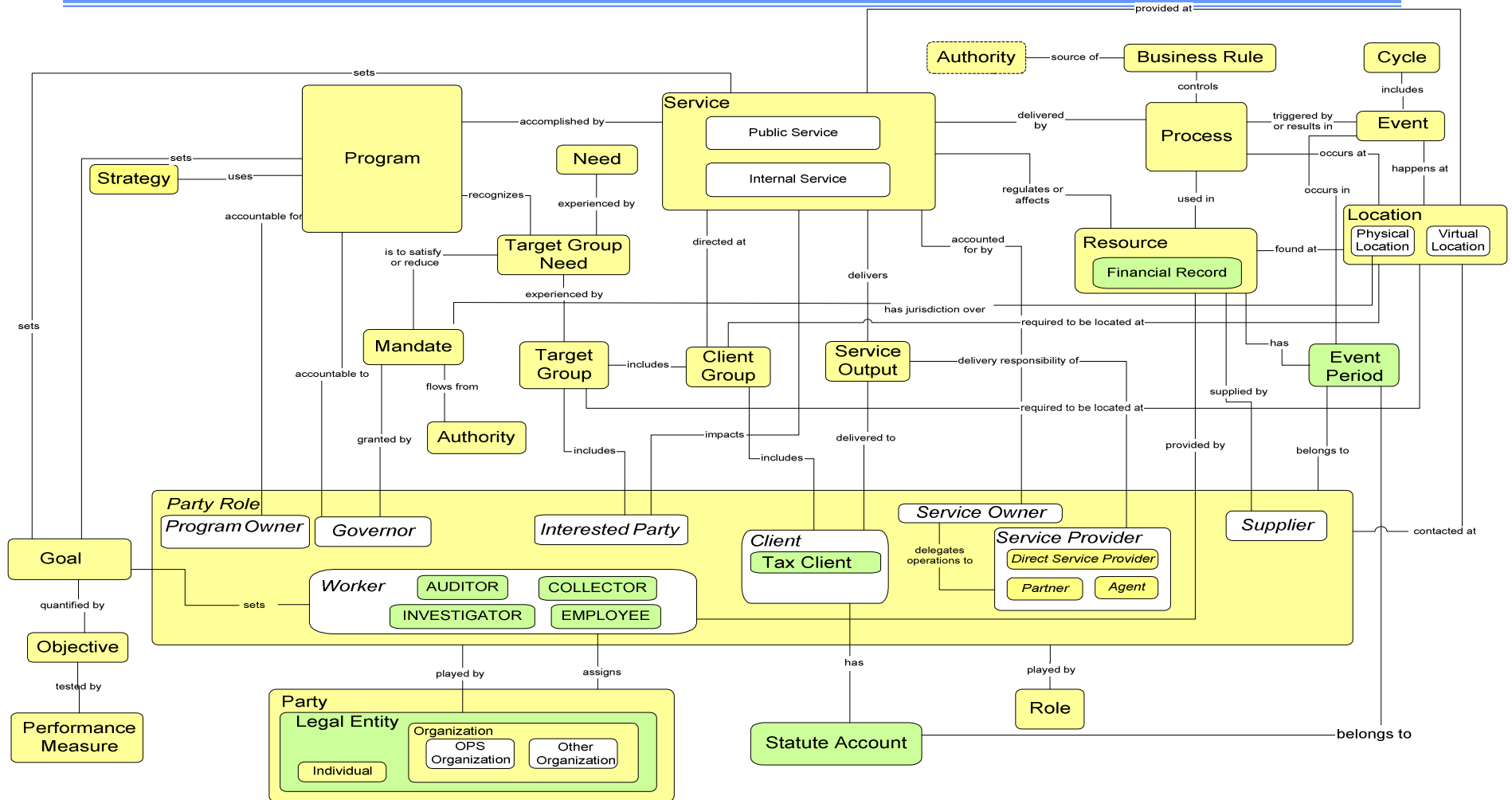


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Conceptual Data Model Overview (Enterprise CDM)



Lessons Learned

- **Education:**
 - Educate business and IT partners on information modeling, the associated artifacts and the OPS architecture governance process early on in the project (e.g. during the project initiation phase).
- **Reference Models:**
 - Use the OPS and organizational reference data models as a starting point for building project data models. Do not start from scratch!
- **Partitioning:**
 - Partition the data model into smaller parts (subject areas) to manage complexity and to facilitate better understanding of the model by the business and IT partners.



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Lessons Learned

- **Ongoing Reviews:**

- Conduct regular review sessions with business experts to ensure business needs are being met.
- Conduct regular review sessions with other domain architects (cluster & corporate) to ensure traceability and that artifacts are being reused appropriately and to ensure that the project is aware of other initiatives underway that may influence the project.

- **Artifact Management:**

- Plan for the integration of project architecture deliverables into the enterprise repository.
- Establish artifact management early on (including baseline).



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OPS Information Architecture URLs

- GO-ITS 56.0 IMH on the GO-ITS site:
http://www.gov.on.ca/MGS/en/IAndIT/STEL02_047295.html



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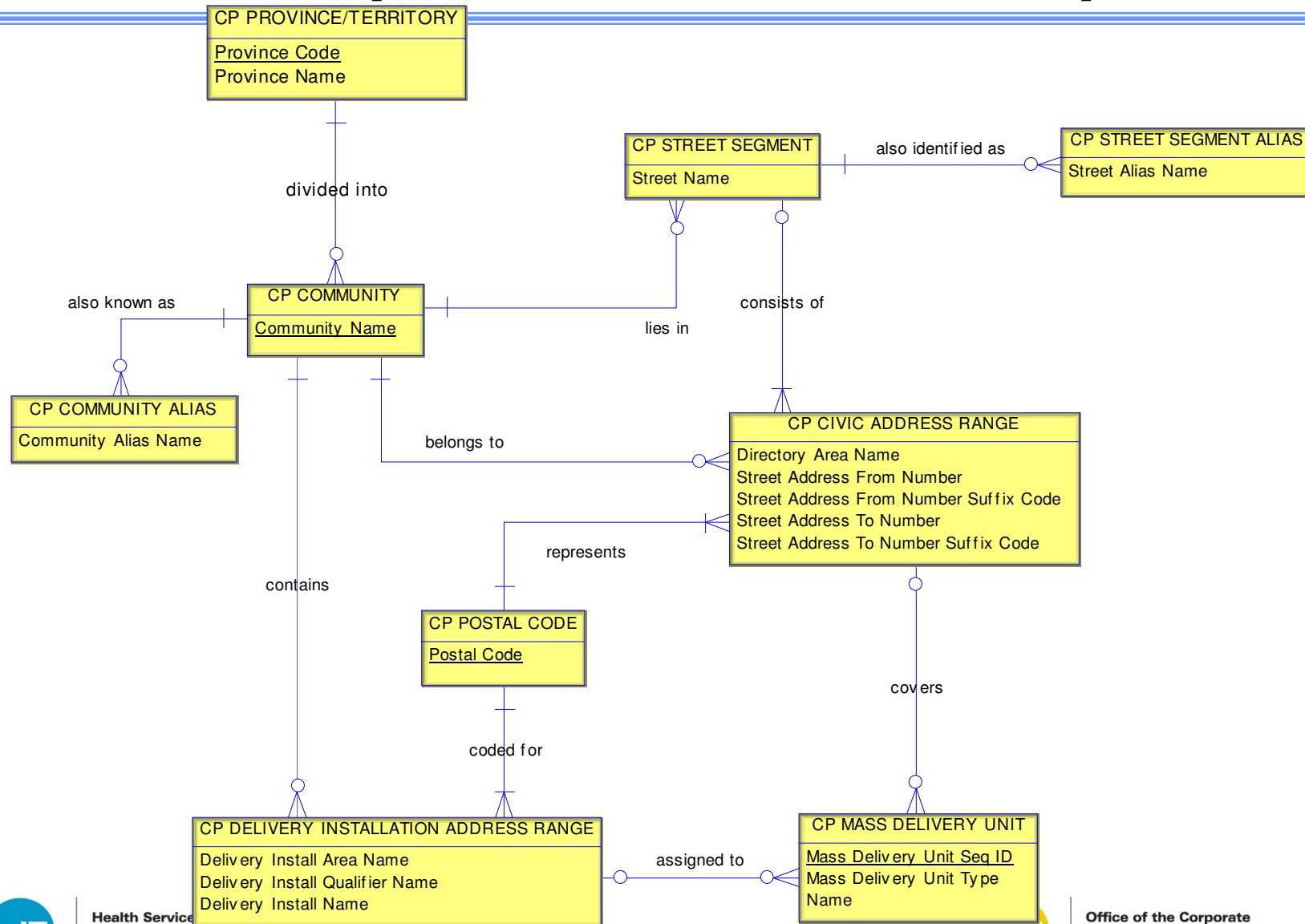
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Types of Models

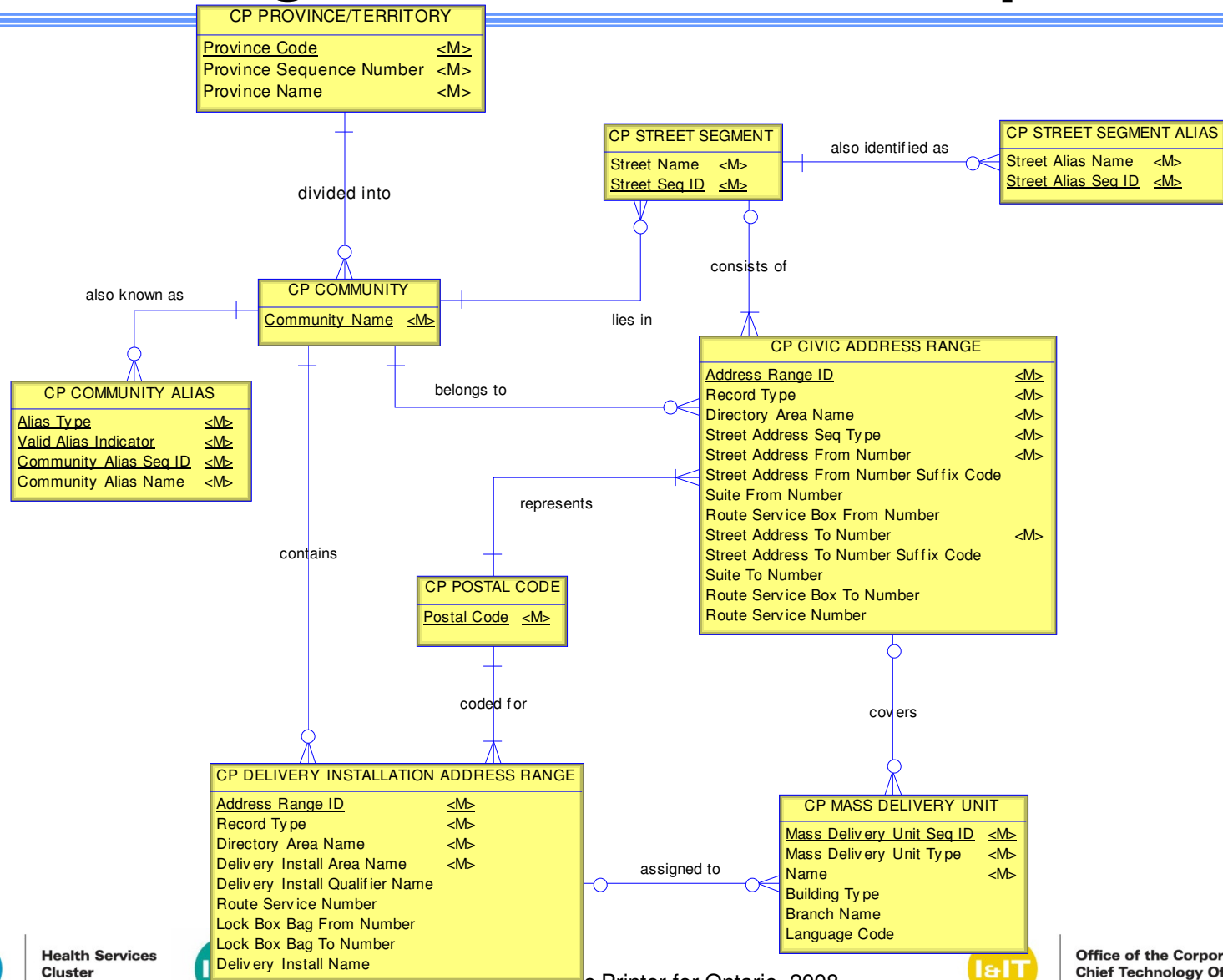
- **Domain Specific Data Models** identify and define data or information patterns and the relationships among these data entities for a specific business or program domain.
e.g. **Program area specific data model, ministry specific data model**
- **Enterprise Wide Data Model** rationalizes different definitions and meanings of data and terms across various business domains and views into a consolidated enterprise view of these entities.
- **Data Models** (Entity Relationship Models or UML class models) define data requirements, assist the design for solution implementation based on a selected paradigm to support the daily operational transaction processing needs of business applications.
e.g. **Project specific conceptual, logical, and physical data models**
- **Dimensional Models** assist in analyzing information requirements, design and develop business intelligence solutions based on the star-schema paradigm to support for business information discovery and better decision making.



A Conceptual Data Model Sample



A Logical Data Model Sample



A Physical Data Model Sample

