Specifying the Use of CIM in an EMS Project

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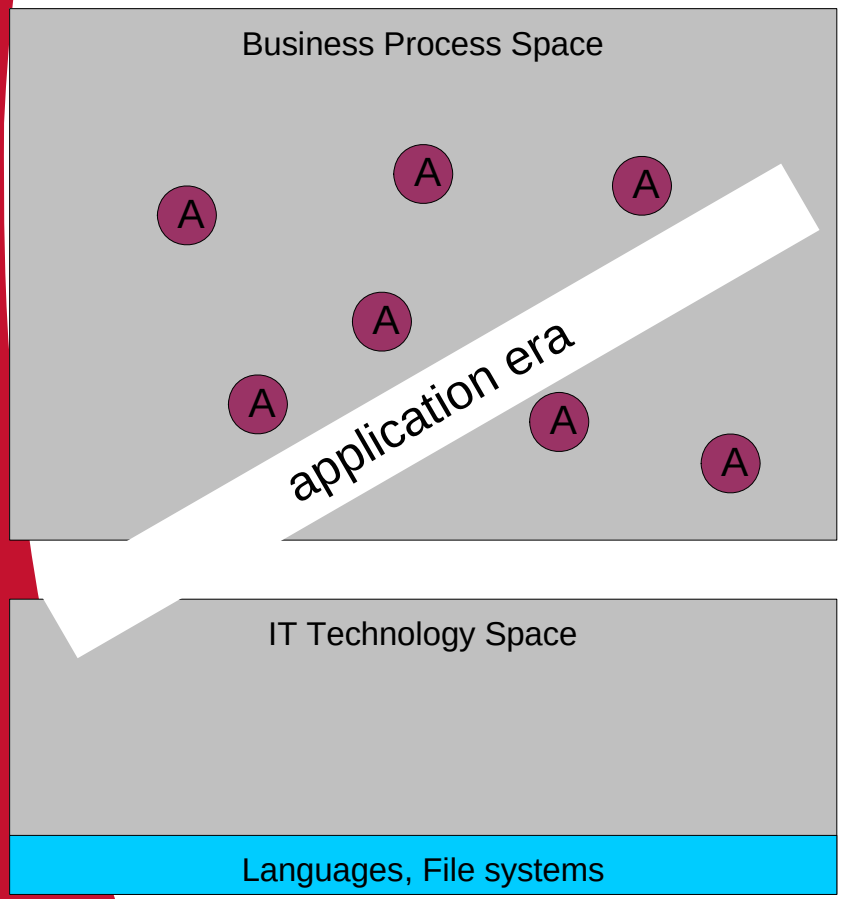
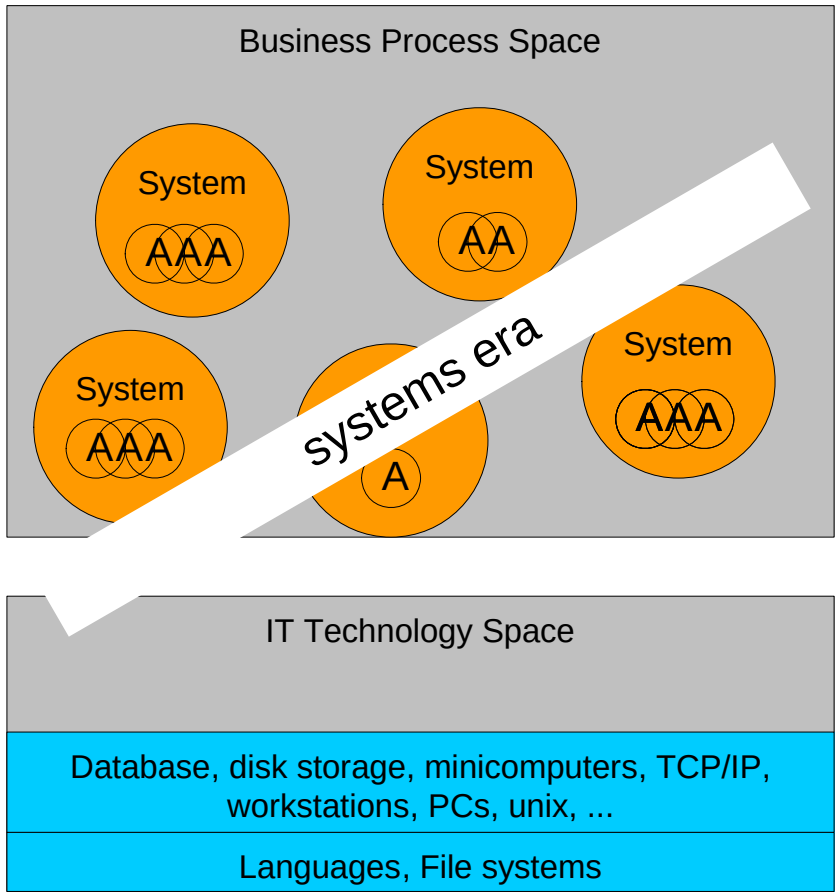
Topics

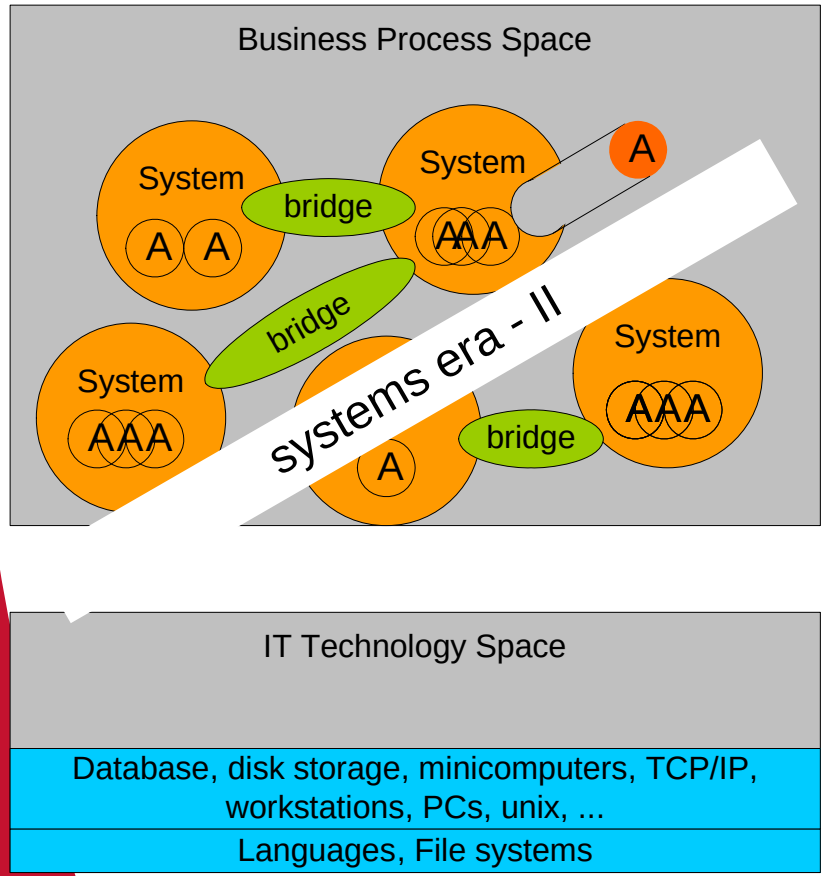
- The CIM Value Proposition -- General
- How to get what will be valuable to your EMS project.

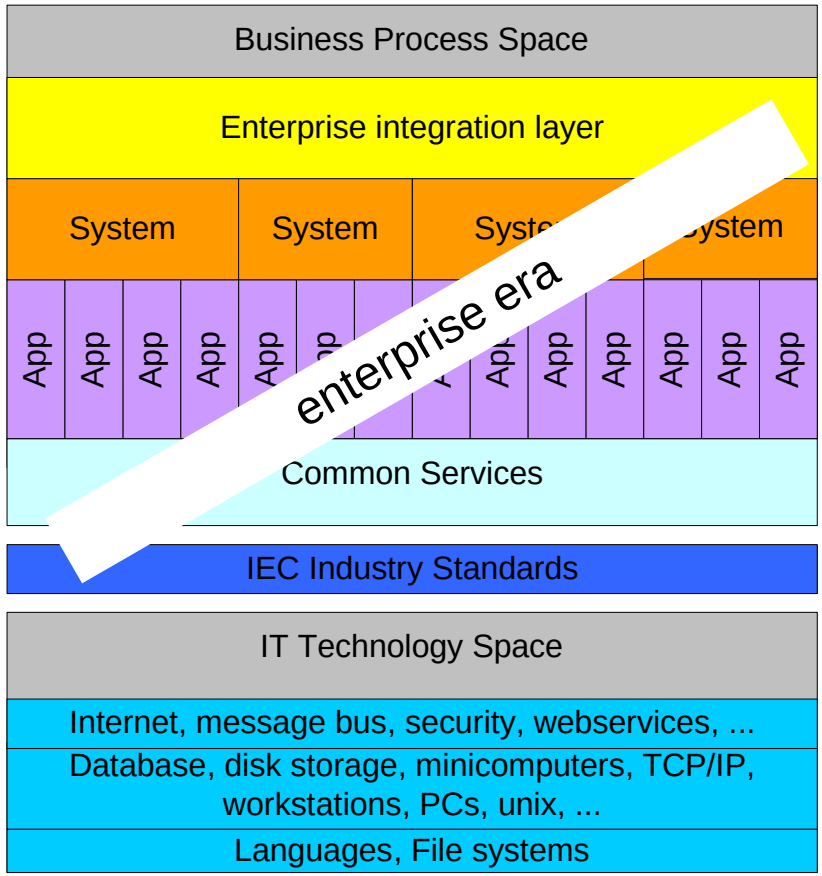
From Applications Era to Systems Era 1975-1990



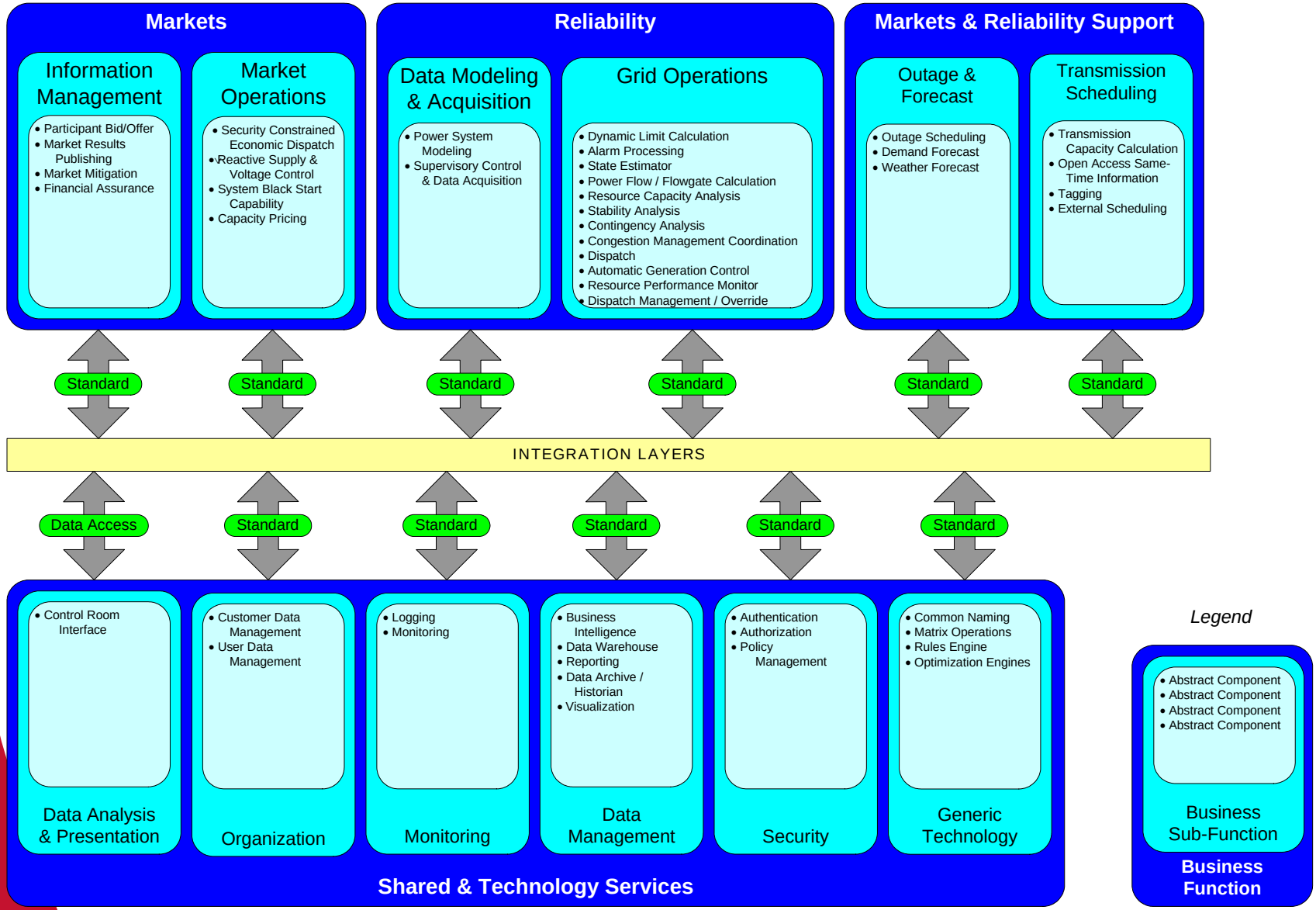


From Systems Era to Enterprise Era 2005-2020

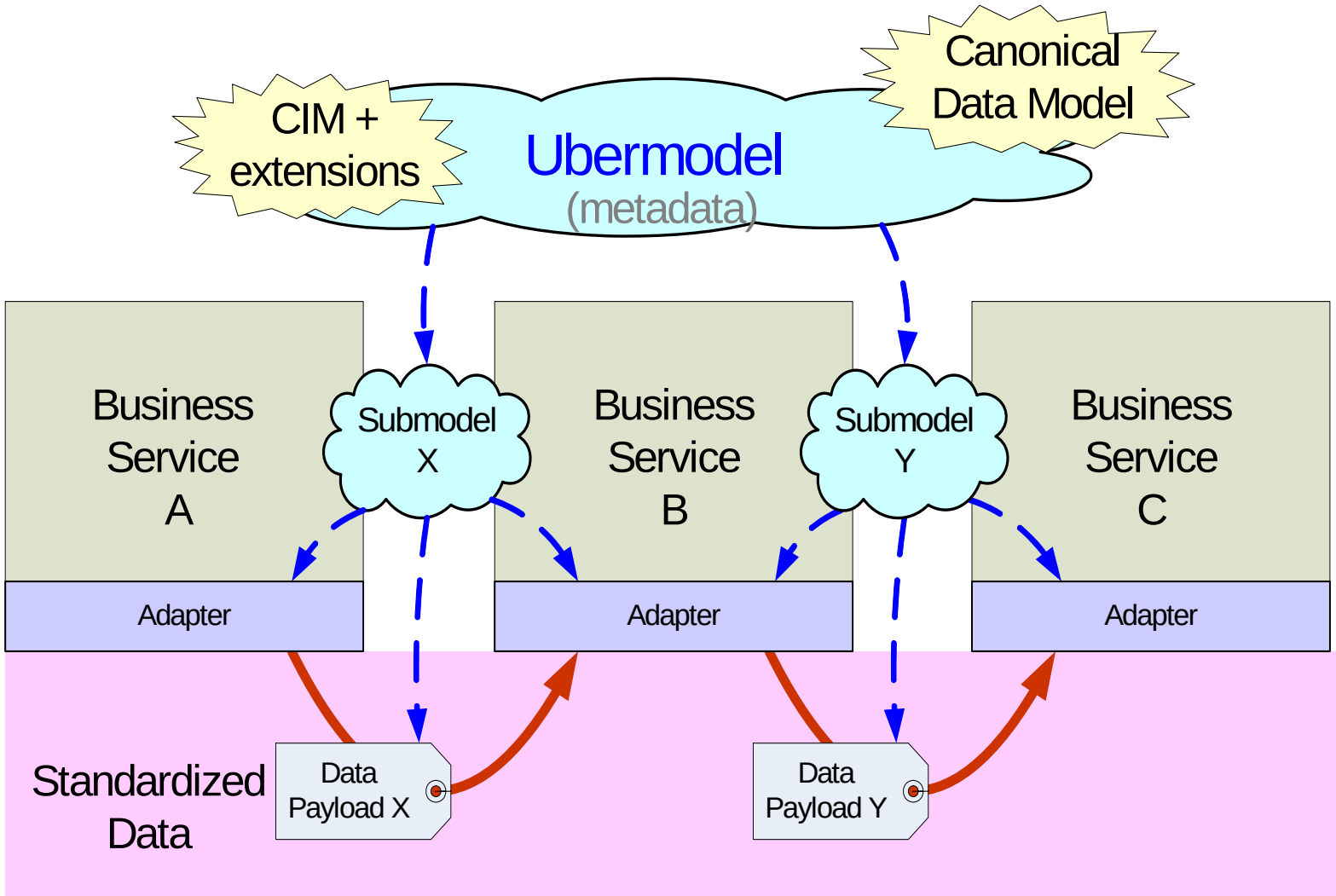




A Current SOA Vision from D2.24



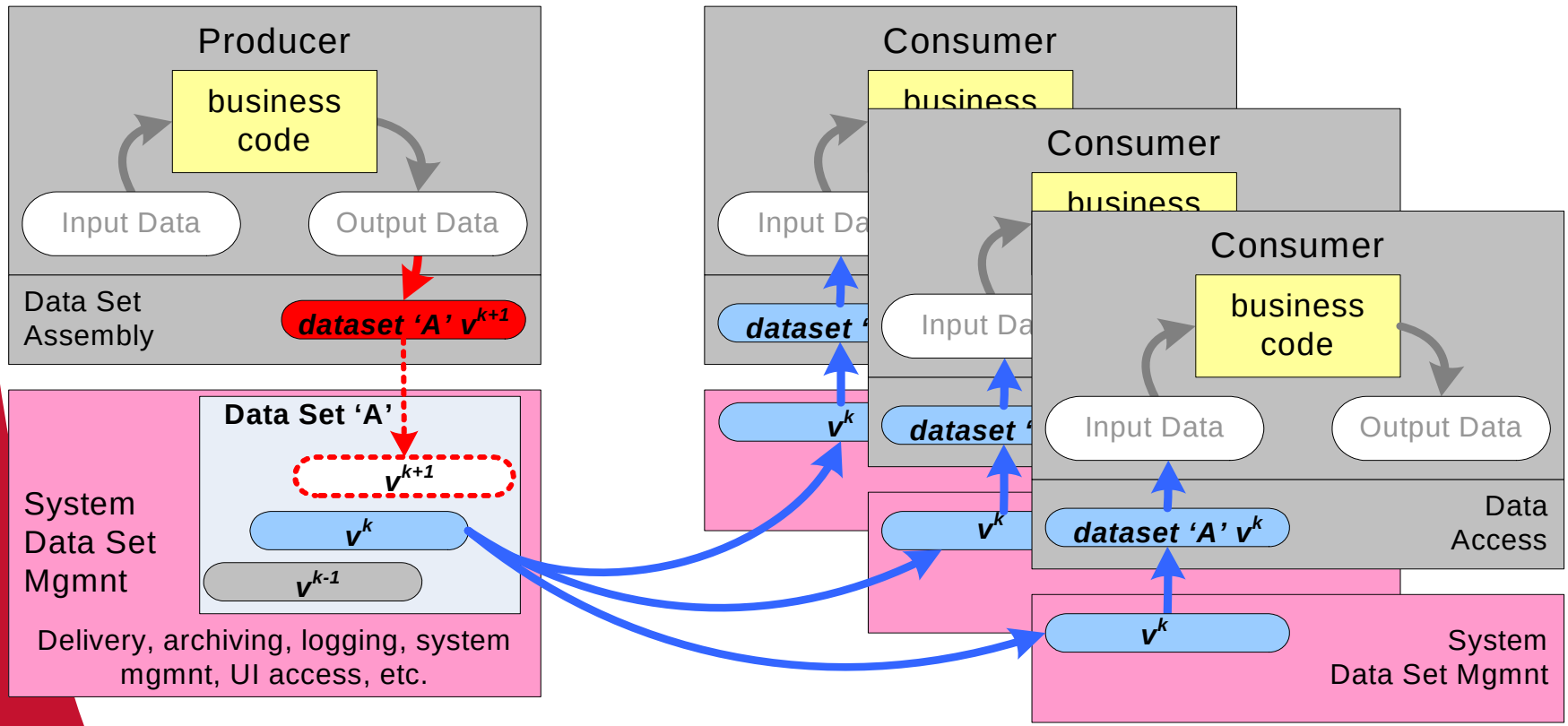
The Canonical Data Model Concept



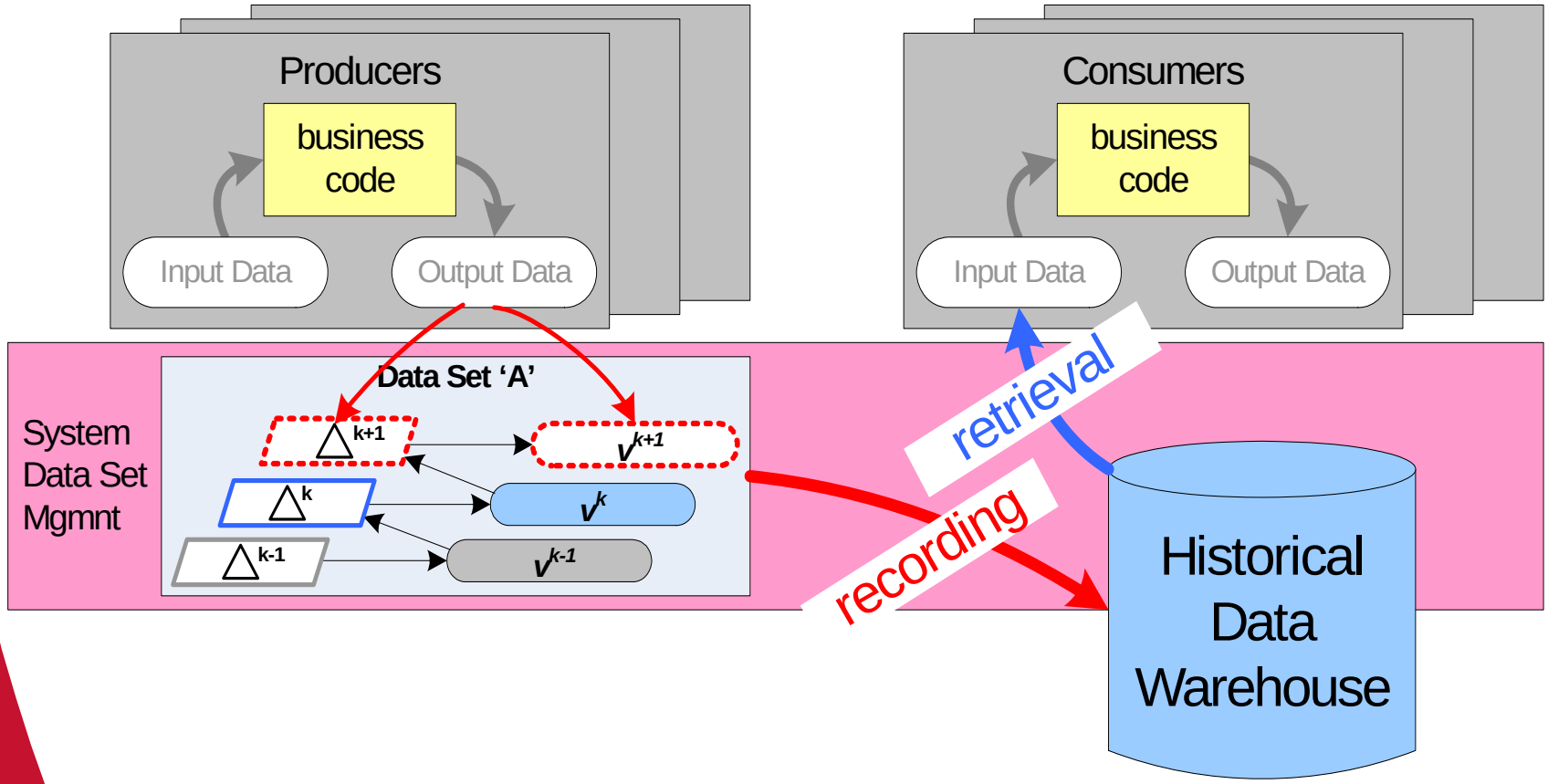
The CIM Value Proposition

- **Enterprise architectural goals …**
  - **Completeness. Organize IT at the enterprise level.**
  - **Consistency.**
    - **Universal data semantics. (CIM canonical data model)**
    - **System management, re-use and integration. (SOA / enterprise integration bus)**
  - **Openness. Increase the customer's freedom to use different vendors.**
  - **Standard interfaces at key interface points.**
- **… lead to lower IT complexity, lower IT cost.**
  - **Concentration of investment in high quality core products.**
  - **Fewer overall skillsets required.**
  - **Less orphaned code.**
  - **More rapid response to business needs.**
  - **Healthy competition.**
- **Incremental implementation – as in an EMS Project.**
  - **Evaluate general vendor commitment to the vision.**
    - **Evaluate existing product conformance.**
    - **Evaluate participation in CIM community.**
    - **Evaluate development program direction.**
  - **Require the specific interfaces that deliver value to the project.**

CIGRE D2.24 Information Architecture
Producer – Consumer View of Interfaces



CIGRE D2.24 Information Architecture
Historical Data



Where do you fit? What are your EMS goals?

- **Leader / Early Adopter**
  - General strategic value seen in leadership.
  - Push IEC / CIGRE D2.24 development.
  - Regional grid operators; very large utilities.
- **Progressive EMS Owner**
  - 3rd generation EMS owner with active evergreen EMS program.
  - Follow IEC / CIGRE D2.24 recommendations.
  - Keep my EMS technology and functionality current.
- **Interconnection Participant**
  - Information exchange with peers and/or regional authorities.
- **Enterprise Functional Integration**
  - My EMS is an enterprise component.
  - Model, real-time and historical data exported; plans imported.
- **Strong IT Program**
  - Canonical data model (“ubermodel”) methodology.
  - Enterprise SOA architecture goals.
  - Enterprise integration bus.
  - Technology selected to minimize skillsets and cost.
- **New to CIM and Ready to Learn**
- **Just want a functional EMS**

General Recommendations for Traditional Specifications

- For leaders:
  - Invest time and resources in the governing committees.
  - Ability to draft appropriate specifications follows from position as insider.
- For others:
  - Find good professional advice…
    - Regularly contributing members of governing committees are always the best source.
    - Assess how close any expert is to the inner circle.
  - Give a weight to the importance of vendor commitment to CIM for your organization.
    - Generic “conform to CIM” specifications are not very productive.
    - Ask the vendors to describe their CIM strategy in depth and in language that creates a commitment to deliver.
    - Don’t force vendors to address requirements if they aren’t really requirements.
  - Include specific requirements that address your specific interface needs.
    - e.g. Require 61970-452 Model Exchange support if you intend to use it for exchange with other utilities.

Ideas for those looking for a better way to buy a system.

- **Abandon the traditional fixed-price competitive bid model.**
  - **What you really want is to select an EMS partner for the future.**
  - **This should be a mutual 'getting to know you' and 'getting to trust you' process.**
- **The most knowledgeable folks in CIM (and other key architectural issues) are the ones that implement it – which is predominantly the various vendors.**
  - **Traditional purchasing rules tend to limit what the vendor can know about you and what you can know about the vendor.**
  - **The way to know each other is to work together.**
- **Instead of keeping the vendors at arms length in the preparation of a specification, use them in the preparation process.**
  - **Share your requirements. Talk to the vendors like you would talk to your consultant.**
  - **Work with each vendor to shape their best answer to your requirements – don't try to make them all conform to the same architectural specification.**
    - **This increases your comparative knowledge of the vendors.**
    - **This gives you direct experience in whether they are easy to do business with.**
- **Weed out vendors as you proceed to refine designs.**
  - **Pay T&M when vendor work becomes significant (limits and rates set by you).**
- **Ask finalists for fixed price commitments to the clearly scoped parts of the contract.**
  - **Some integration work is never clear enough to work well as fixed price.**
- **Select final vendor(s) to work with.**

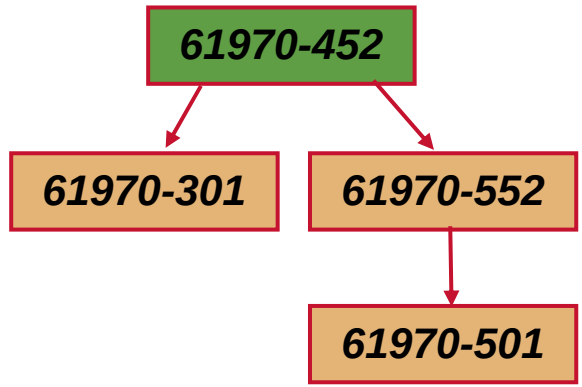
Problematic CIM Requirements

- **Some paraphrased EMS CIM language that we see in specifications…**
  - **compliance with the Electric Power Research Institute (EPRI) Common Information Model (CIM)**
  - **compliance with the Control Centre Application Programming Interface (CCAPI) initiatives**
  - **CIM/XML model exchange compliance**
  - **CIM interfaces to EMS data compliant to GID (Generic Interface Definition)**
    - **Generic Data Access (GDA)**
    - **Generic Eventing and Subscription (GES)**
    - **High Speed Data Access (HSDA)**
    - **Time Series Data Access (TSDA)**
  - **CIM compliance defined as meaning that interface definitions comply with the CIM UML model in terms of:**
    - **Grouping of data into classes**
    - **Naming and meaning of data**
    - **Type of data**
    - **Relationships between CIM classes**
- **Problems:**
  - **Inexact references to documents.**
  - **Overlapping functionality in the methods.**
  - **Generic methods are prescribed without stating what data is to be available via what methods.**

Stating Specific CIM Requirements

- **Always start by defining the scope (business function) of the interface.**
  - **If there is an IEC standard, start with the document that describes the business function.**
    - **IEC CIM document structure isn't always helpful in figuring this out.**
  - **If there is a CIM standard in progress, use a draft of that work.**
    - **e.g. State estimator output is a work currently in progress.**
  - **Or, write your own scope for an interface that you need.**
    - **You will be asking here for the vendor to develop an interface based on a CIM extension.**

- **Example – for the network model exchange standard:**
  - **The right starting place is the 61970-452 document that explains the business problem and identifies the data items required in network model exchange.**
  - **452 depends on the 61970-301 document, which gives the CIM UML information model defining the structure of the required data.**
  - **452 also depends on the 61970-552 document, which defines how to format a model exchange file using RDF XML encoding. (552 in turn depends on some information in the 501.)**
  - **Just as importantly, this standard does <u>not</u> depend on the 61970-4xx series of documents that define the GID, so GID access is <u>not</u> part of the model exchange standard.**



Summary: CIM Specifications in an EMS

- **Ask the vendors to describe their CIM strategy in depth and in language that creates a commitment to deliver.**
- **Write individual specifications for CIM business interfaces that have a specific value proposition.**
  - **If there is a specific IEC standard for the interface, reference it.**
  - **If there is no specific CIM standard, then…**
    - **Describe the business purpose.**
    - **Describe the required content of the 'datasets' (CIGRE D2.24 term).**
    - **Require the vendor to design the datasets by extending the CIM and deriving a schema from the CIM.**
    - **State implementation requirements for each interface.**
      - **Preferred – require vendor to specify what implementation technology or standard will be used.**
      - **Alternatively – require specific mechanisms as appropriate to your enterprise architecture goals: (61970-552 (RDF XML), 61970-4xx GID data access, XML schema, integration bus vs claim-checked files vs other, etc.)**