

# Enterprise Information Solutions

## Model Driven Information Exchange (MDIE)



Information Management  
Solutions Consultants, Inc.

*Next generation of semantic solutions*

## Our Vision

Be a leader in the delivery of technology solutions that include Semantic Technologies, Enterprise Integration and Architecture, SOA, and Business Intelligence. Fuse business processes and information to resolve business and mission-critical applications through innovative Semantic Technologies, SOA technology and domain knowledge.

## Our Values

- IMSC developed state of the art Semantic and Data Alignment technology
- All employees 10 years plus experience working in data management and architecture
- Secret and multiple Top Secrets clearances
- Built by excellent people with a commitment to excellence
- Focused on technical growth
- Motivated by employee owners

## Our Successes

- Key positions in DoD such as DCMO, Amry, BTA, OSD, DLA, FBI, CIA, NRO, NSA, DOT and other services and Agencies
- Leading provider of SOA services, Semantic Technologies and Data Management Solutions
- Strategic partnerships with large System Integrators

# IMSC Solutions

## Model Driven Information Exchange (MDIE):

### **Problem Statement**

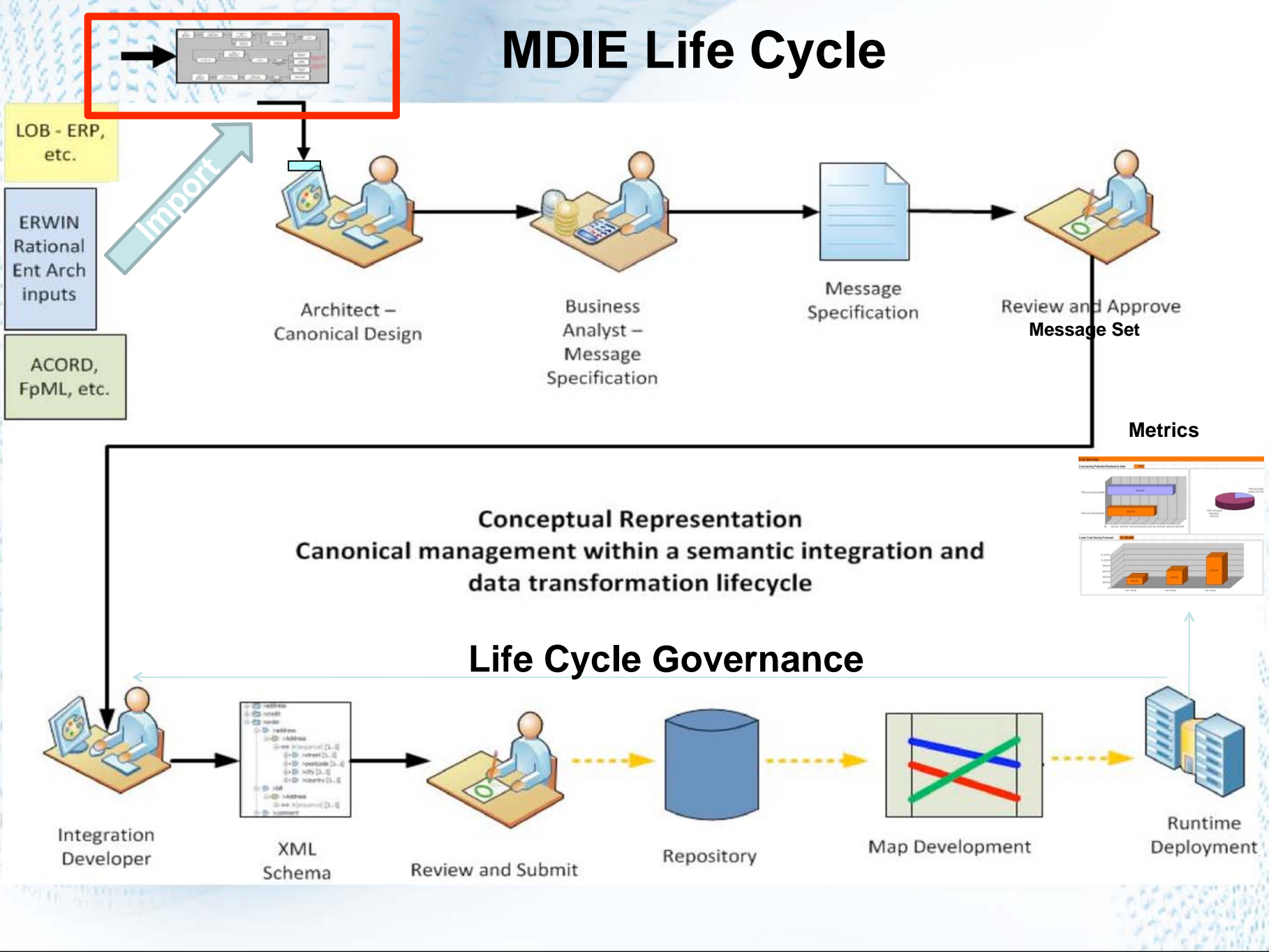
- Silos of data with schemas that need to be reconciled to a canonical model
- Manual process is inflexible and expensive
- Complex integration and coupling of systems

### **Solution**

- Common Vocabulary is a solution that automates the mapping of multiple schemas and creates a canonical model
- Physical Data Model is aligned to Logical Model
- Interfaces and Enterprise Services (XML) are deployed using the Canonical model (Physical and Logical)
- More efficient, less cost to develop interfaces and less cost to maintain.

BEA CV Metadata

# MDIE Life Cycle



LOB - ERP, etc.

ERWIN Rational Ent Arch inputs

ACORD, FpML, etc.

Import

Architect - Canonical Design

Business Analyst - Message Specification

Message Specification

Review and Approve Message Set

Metrics

Conceptual Representation  
Canonical management within a semantic integration and data transformation lifecycle

## Life Cycle Governance

Integration Developer

XML Schema

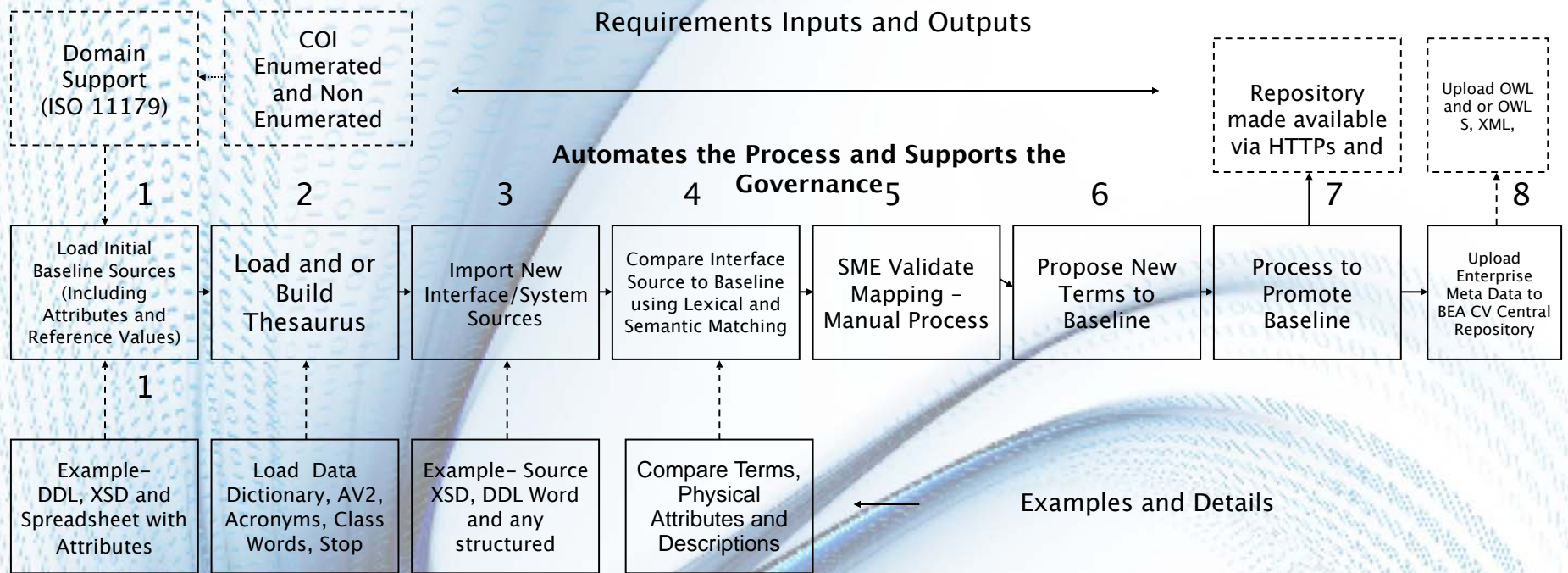
Review and Submit

Repository

Map Development

Runtime Deployment

# Common Process for Comparing and Building a Common Vocabulary




# SME Approval Process via the Web

accounting classification reference number acrn - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address [http://localhost/abinitio/aiwcgi.py?client=&/abinitio/extensions/bmr-render.py=&base\\_version=&debug=0&show\\_untagged=&det](http://localhost/abinitio/aiwcgi.py?client=&/abinitio/extensions/bmr-render.py=&base_version=&debug=0&show_untagged=&det) Go Links



Search in Term for  Go

MAIL | COMMON VOCABULARY ENVIRONMENT | ORGANIZATIONS | PERSONS | GLOSSARY LOOKUPS | ADMIN | Change Password

Advanced Search  
Create Object  
Logout

**Term: accounting classification reference number acrn** [ modify... | delete... | show versions ]

**Term Group** DDM\_AR\_Principal\_Balance

**Description** control code assigned in accordance with dfars section 2047107

**Business Term Type** Attribute

**Find Acronyms for this Term**  Search

**User Feedback Notes**  Add Feedback

Audit Attributes | Details | Attributes | Matches | **Matches Workflow** | User Feedback

Create New Match

**Source Terms Matched** [ Export ] [ Add/Remove... ]

Matched Term	Description	Term Group	Status	Similarity	Matching Grade	Approval	Reject	Pending
none 0 items								

---

**Target Terms Matched** [ Export ] [ Add/Remove... ]

Matched Term	Description	Term Group	Status	Similarity	Matching Grade	Approval	Reject	Pending
account classification reference number	a character string that specifies the discrete accounting classification of a ...	BEA6_av-2	Pending	1	BA	<input type="button" value="Approve"/>	<input type="button" value="Reject"/>	<input type="button" value="Pending"/>

1 item

Local intranet

BEA CV Metadata

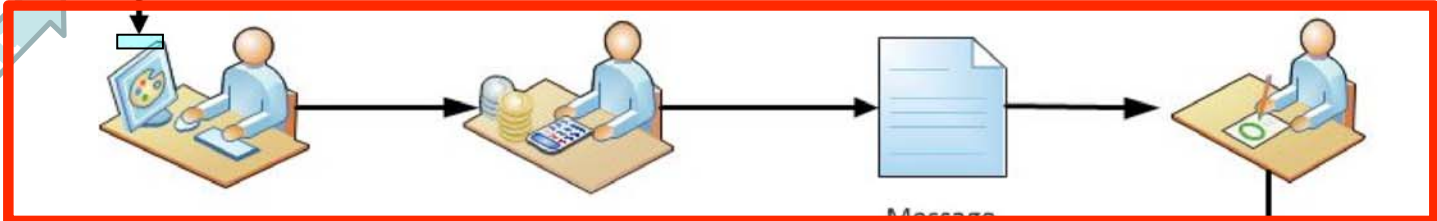
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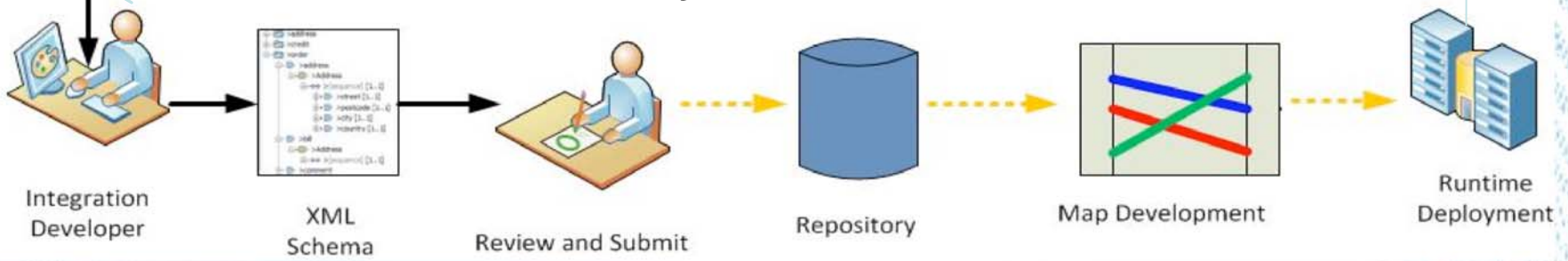
Review and Approve Message Set

Metrics



Conceptual Representation  
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## Life Cycle Governance



Integration Developer

XML Schema

Review and Submit

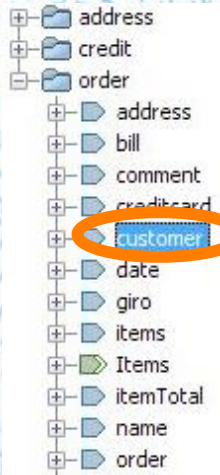
Repository

Map Development

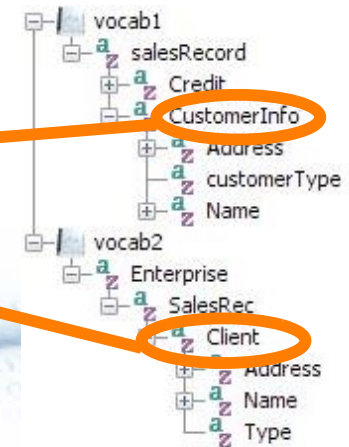
Runtime Deployment

# Overlapping Vocabularies

## Canonical Model



Relates to



A screenshot of a software interface showing the configuration of a vocabulary entry. On the left is a tree view of the Canonical Model with 'customer' selected. The main area is titled 'Vocabulary entries for this object.' and contains two entries: 'Vocabulary B.Enterprise.SalesRec.Client.Name' and 'salesRecord.CustomerInfo.Name'. To the right is a configuration panel with the following fields:

Vocabulary Name	CustomerReference
Vocabulary Path	CustomerReference
Business Identifier	CustomerReference
Definition	
Value List	

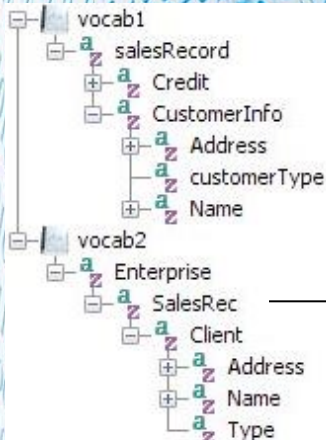
At the bottom of the interface are several tabs: Properties, Taxonomy, Vocabulary, Attributes, Structure, Data Type, Constraints, Source, Instance, Meta Data, and Notes. The 'Vocabulary' tab is currently active.

# Re-using the Model NOT XML Schema

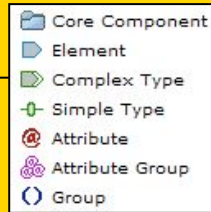
## XML schema



## Data Models



## Decompose

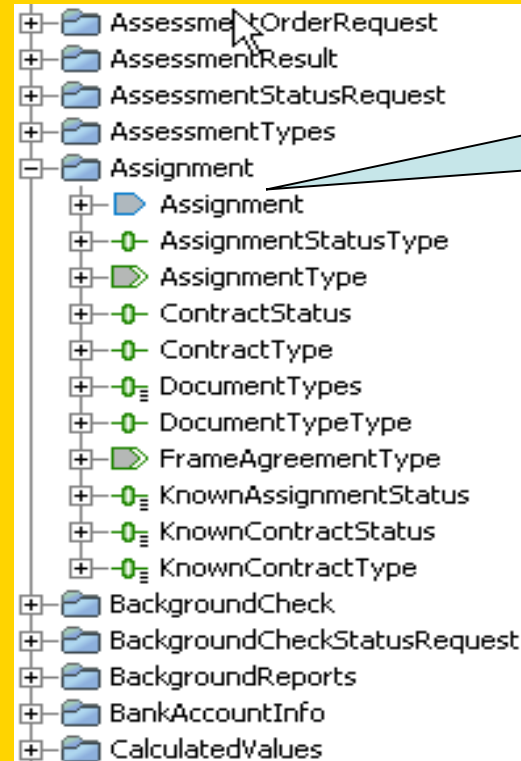


1. Import XSD decomposes XML schema into reusable schema objects

## Import

3. Import Semantics from Data models to overlay onto Canonical Model

## Canonical Model World



2. Reusable schema objects are organized in Core Components (blue folders).

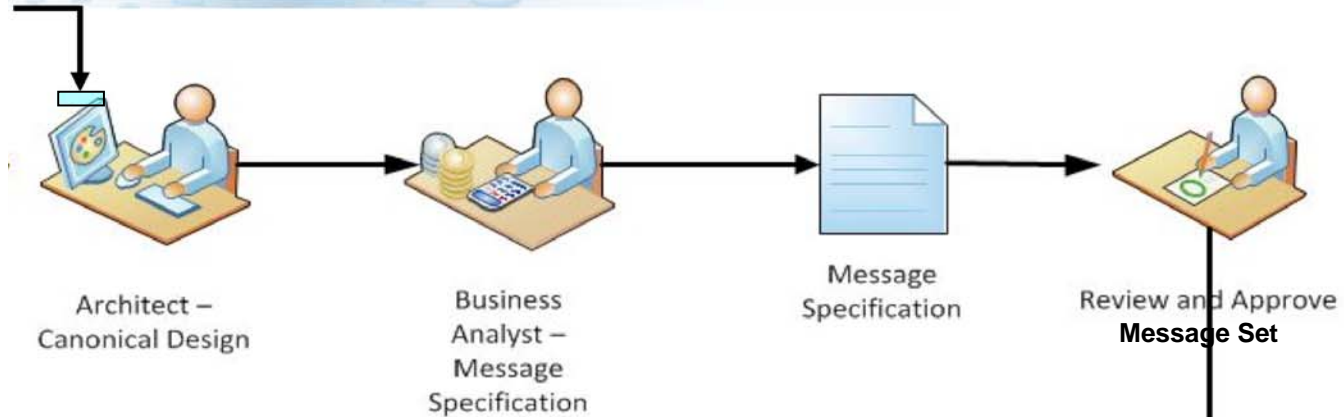
Build Specifications  
Build Messages / Services  
Mappings

4. Select components to auto generate XSD messages and mappings report

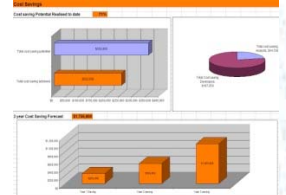


BEA CV Metadata

# MDIE Life Cycle

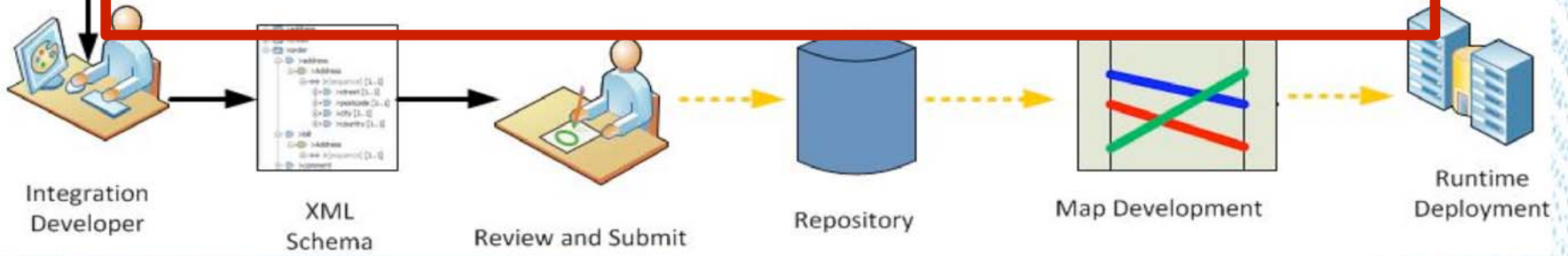


Metrics



Conceptual Representation  
Canonical management within a semantic integration and data transformation lifecycle

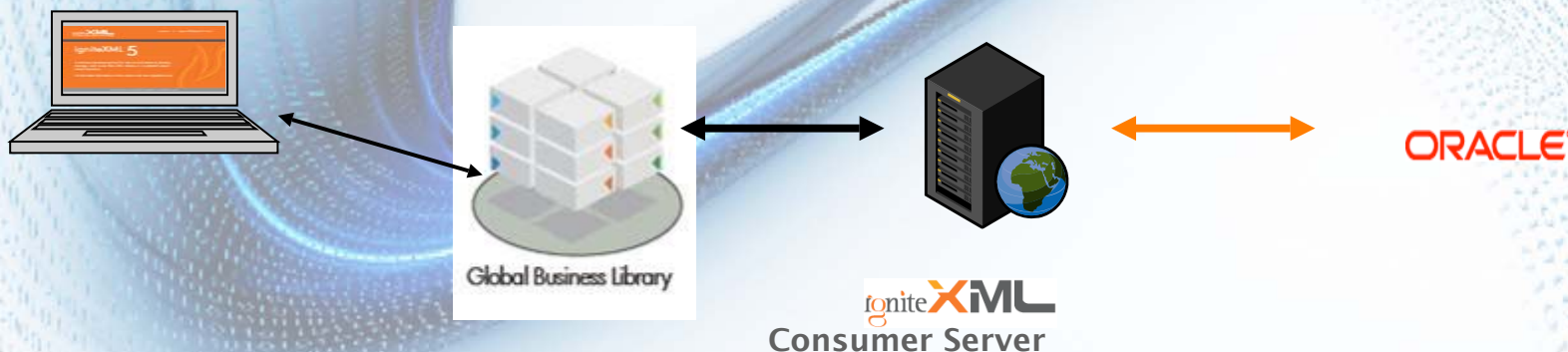
## Life Cycle Governance



# Governance Scenario 2

- The Integration Developer now wants to re-use a Schema but discovers it is now flagged as “NOT current”.
- From OER he can click through to ICS
- ICS will then take him through the steps of generating a “Current Schema” including telling him if that pick list is no longer relevant because the changes to the model have invalidated his pick list.

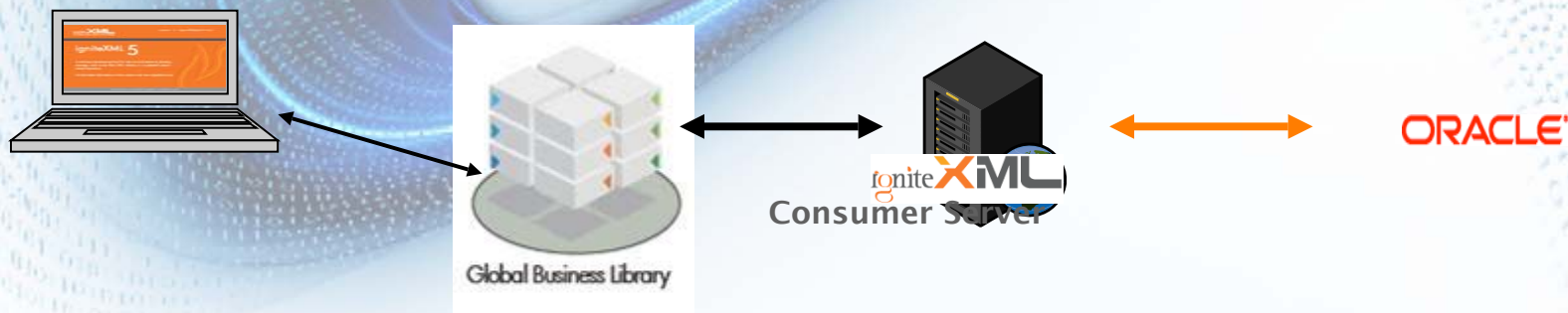
## Organizers (Model Management)



# igniteXML and OER Impact Analysis

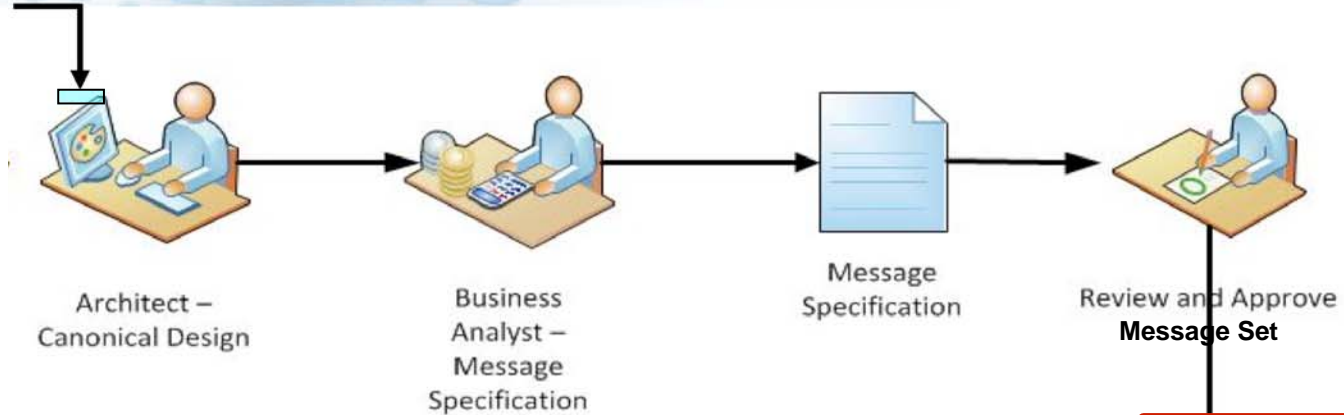
- The EBO Architect has the capability within igniteXML to understand the impact of changes at a component level to not only the model but to Subset Schema's which have been built from ICS.
- With the integration as previously described there may be less need for extended impact analysis beyond the Model, as the trend will be to generate new subsets from the current model which are for one time use, however;
- If required a notification mechanism can be deployed where the owners of the runtime schema are notified of changes via Oracle

## Organizers (Model Management)

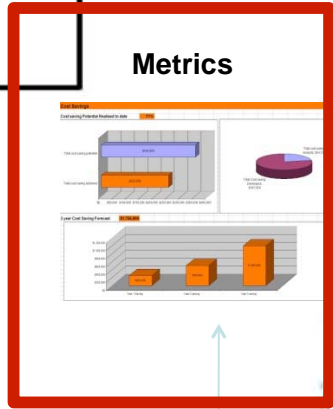


BEA CV Metadata

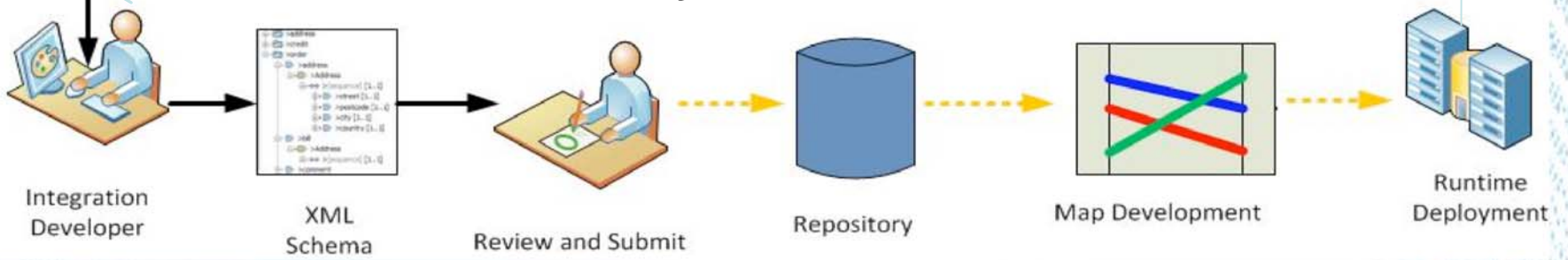
# MDIE Life Cycle



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## Life Cycle Governance

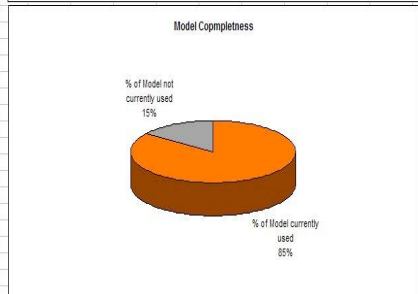
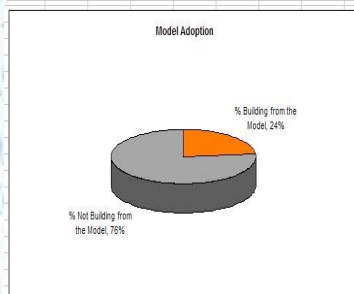
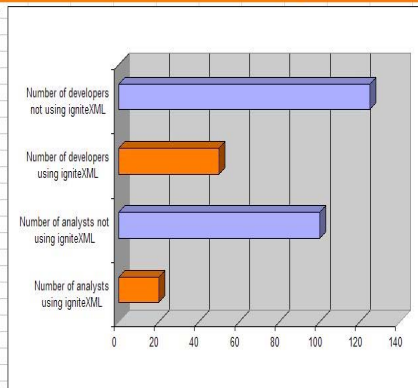
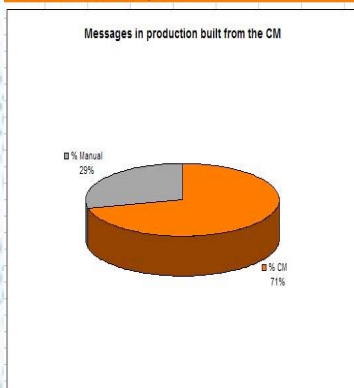


# Reporting Metrics in igniteXML

- Measure Reuse
  - Model Adoption
    - Track the % of runtime messages originated from the Canonical Model
    - Track the number of active model consumed by
      - Analysts, numbers and % of total
      - Developers, numbers and % of total
    - Measure the amount of reuse in the model & model completeness
- Measure Agility
  - Track the reduction of project duration – elapsed & actual time
  - Track the improvements in runtime performance due to runtime optimization of messages
  - Track the reduction in mappings to be managed
- Measure cost savings
  - Dev. time savings by analyst / developer hours saved
  - Estimate the potential savings v % achieved
  - 3 year forecasted savings

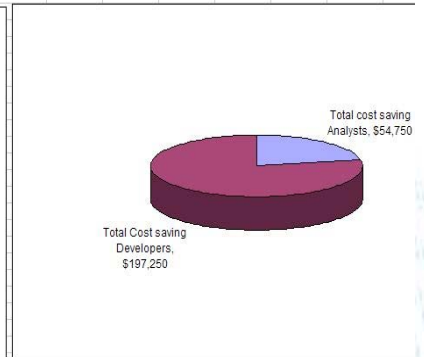
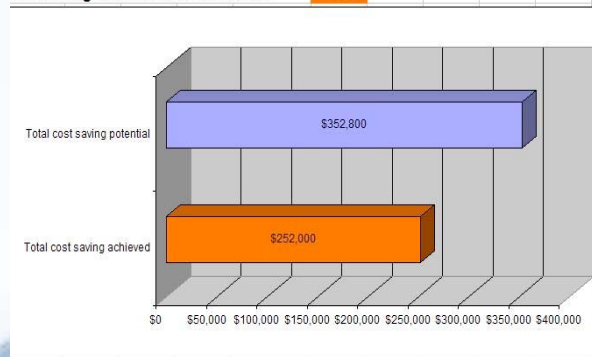
# Reports and Analysis of Usage

## Canonical Model Adoption



## Cost Savings

Cost saving Potential Realised to date **71%**

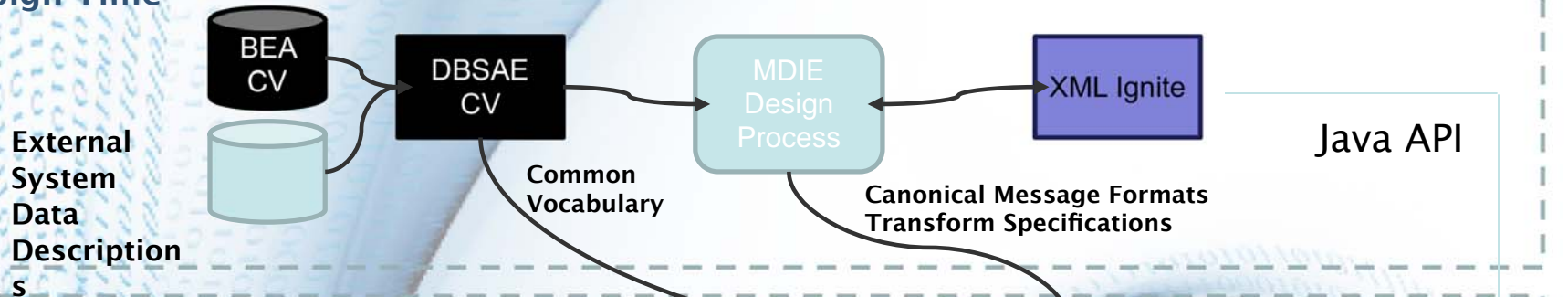


3 year Cost Saving Forecast **\$1,756,800**

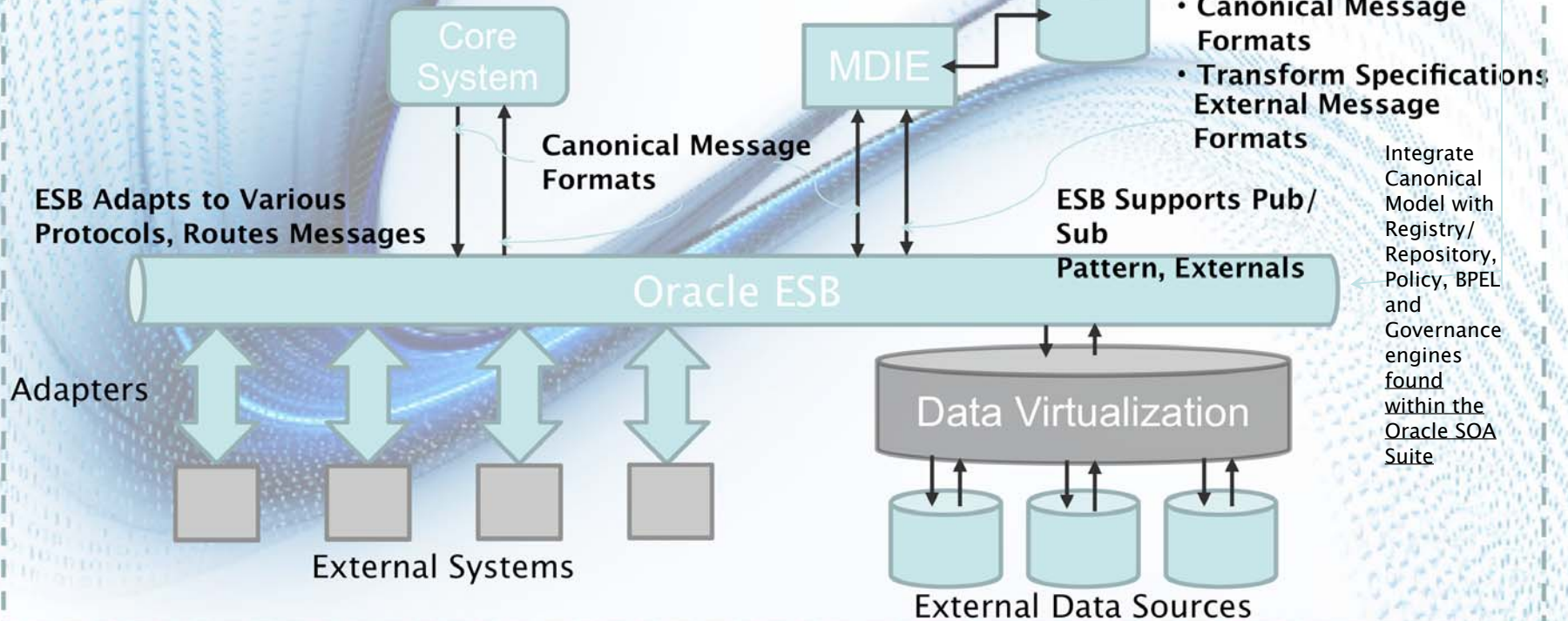


# MDIE Architecture

## Design Time



## Run Time



# Where do we go next and how can a Semantic Solutions

## **Problem Statement:**

- Tools are complex and require extensive training
- Ontology development methodology is complex and requires specialized and experienced skills that have limited resources
- Business users are not directly involved
- Visualization tools are limiting

## **Solution:**

- Control Natural Language (CNL)
- Reuse of available industry vocabularies
- Automatic publishing (RDF/OWL,Turtle)

The background features a dynamic, abstract composition. It consists of several thick, flowing, blue lines that curve and swirl across the frame, creating a sense of motion and depth. These lines are set against a light blue background that is densely populated with a pattern of binary code (0s and 1s). The binary code is rendered in a slightly darker shade of blue, creating a subtle, textured effect. The overall aesthetic is clean, modern, and tech-oriented.

# Controlled Natural Language Ontologies

# Do you agree with this?

```
<?xml version="1.0"?>
<Ontology xmlns="http://www.w3.org/2002/07/owl#"
  xml:base="file:/c:/test/Document"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:xml="http://www.w3.org/XML/1998/namespace"
  ontologyIRI="file:/c:/test/Document">
  <Prefix name="rdf" IRI="http://www.w3.org/1999/02/22-rdf-syntax-ns#"/>
  <Prefix name="rdfs" IRI="http://www.w3.org/2000/01/rdf-schema#"/>
  <Prefix name="xsd" IRI="http://www.w3.org/2001/XMLSchema#"/>
  <Prefix name="owl" IRI="http://www.w3.org/2002/07/owl#"/>
  <Declaration>
    <Class IRI="Document#GoodDriver"/>
  </Declaration>
  <Declaration>
    <ObjectProperty IRI="Document#hasTrafficViolations"/>
  </Declaration>
  <ObjectPropertyDomain>
    <ObjectProperty IRI="Document#hasTrafficViolations"/>
    <ObjectComplementOf>
      <Class IRI="Document#GoodDriver"/>
    </ObjectComplementOf>
  </ObjectPropertyDomain>
</Ontology>
```

# Do you agree with this?

The screenshot shows an ontology editor window titled "Document (file:/c:/test/Document) - [C:\Users\cmoran\Desktop\nlp4j\GoodDriver.owl]". The interface includes a menu bar (File, Edit, Ontologies, Reasoner, Tools, Refactor, Tabs, View, Window, Help) and a toolbar with navigation icons. The main workspace is divided into several panes:

- Object property hierarchy: hasTrafficViolations:** Shows a tree view with "topObjectProperty" expanded to reveal "hasTrafficViolations".
- Annotations: hasTrafficViolations:** A pane for adding annotations, currently empty.
- Characteristics: hasTrafficV:** A list of property characteristics with checkboxes:
  - Functional
  - Inverse functional
  - Transitive
  - Symmetric
  - Asymmetric
  - Reflexive
  - Irreflexive
- Description: hasTrafficViolations:** A pane for defining the property's domain and range. The "Domains (intersection)" section contains a single entry: "● not (GoodDriver)". Other sections like "Ranges (intersection)", "Equivalent object properties", "Super properties", "Inverse properties", and "Disjoint properties" are currently empty.

At the bottom of the window, there is a status bar with the text "To use the reasoner click Reasoner->Start Reasoner" and a checked checkbox for "Show Inferences".

The background features a complex, abstract design. It consists of several layers of blue, wavy, ribbon-like shapes that curve and flow across the frame. These shapes are set against a backdrop of binary code (0s and 1s) that is rendered in a light blue, semi-transparent font. The overall effect is a sense of digital motion and data flow.

Or this. . .

A good driver does not have traffic violations.

# Examples of CNL Statements

- **Facts about specific things (a-box)**

The president has "responsibility for US Policy".

The Commander in Chief is the "President of the USA".

The President of the United states is a "Commander in Chief".

The President's height value is 72.

The President's adviser is "John Smith".

- **General Knowledge (t-box)**

A soldier is a "member of the armed forces".

A war fighter reports to the "Commander in Chief".

A war fighter is a person.

A soldier is a war fighter.

A sailor is a war fighter.

The army is an "armed force".

The background features a light blue, wavy, ribbon-like shape that curves across the frame. This shape is set against a backdrop of faint, repeating binary code (0s and 1s) that creates a sense of depth and digital texture. The overall aesthetic is clean, modern, and tech-oriented.

**Q&A**