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# Federal Transition Framework Metamodel Reference

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Version 1.0  
December 2006

## Revision History

Date	Version	Approver	Summary of changes
June 2006	Pilot	Dick Burk	Initial version
December 2006	Version 1.0	Dick Burk	Version 1.0; includes updates to metamodel and notation

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# 1 Introduction

## 1.1 OVERVIEW

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The Federal Transition Framework (FTF) provides clear and consistent information to describe government-wide IT policy objectives and cross-agency initiatives.

The FTF does not create IT policy. It provides a simple structure to organize and publish existing information to:

- Enhance the quality and consistency of information on cross-agency initiatives
- Increase the level and speed of adoption of cross-agency initiatives
- Improve the overall effectiveness and efficiency of IT investments and programs related to cross-agency initiatives.

## 1.2 ABOUT THE FTF PACKAGE

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Three documents are provided to describe the content and structure of the Federal Transition Framework and how it should be used:

- **FTF Usage Guide:** Provides guidance to agency decision-makers and cross-agency stakeholders on how to apply and extend the FTF. This is the first document to read when starting to learn about the FTF and how it should be used.
- **FTF Catalog:** Provides a written description and information references for cross-agency initiatives included in the FTF.
- **FTF Metamodel Reference:** Provides information on the internal structure of the FTF. This document is provided as a technical reference for architects.

## 1.3 ABOUT THIS DOCUMENT

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This document is a companion to the FTF Catalog. The Metamodel Reference describes the structure of the FTF, including the types of information contained within the FTF and the relationships among these types. These structural aspects of the FTF are known as a metamodel. This document is intended to be used by agency enterprise architects who are responsible for integrating their agency's target enterprise architecture with the FTF, and by tool vendors who intend to integrate FTF content into their EA repository and modeling products.

This document is organized into the following sections:

- **Metamodel Overview:** This section introduces key concepts associated with the FTF metamodel, provides an overview of the metamodel layers and explains the idea behind FTF Cross-Agency Initiatives (CAIs).
- **FTF Model Elements by Layer:** This section describes each metamodel element in detail. This includes all entity types, type attributes, and relationships. These elements are grouped logically into metamodel layers.
- **Documenting the FTF Metamodel:** This appendix explains the conventions used to document the metamodel, including UML notation

## *1.4 MAJOR CHANGES IN THIS VERSION*

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Version 1.0 of the FTF Metamodel primarily consists of incremental changes from the previous (Pilot) release. The changes can be summarized as follows:

- Consistent with the Data Reference Model 2.0, an additional type, Digital Data Resource, has been added to the data layer
- An association relationship has been created between the types Exchange Package and Shared Service
- For an attribute with a restricted set of values, the attribute type is now an Enumeration
- Type and attribute naming have been refined for consistency with Federal XML guidelines

## *1.5 MAINTENANCE OF THE FTF METAMODEL*

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The FEA PMO is working with the Object Management Group (OMG), a voluntary consensus standards body, to implement further refinements to the FTF Metamodel, including both UML and XML Schema representations. This is being performed through the OMG Government Domain Task Force (GovDTF) and has established the Federal Transition Framework Metamodel Working Group. Participation in the FTF Metamodel Working Group is welcomed. For further information, please visit <http://gov.omg.org/gov-wg-usgov-fff.htm>.

## *1.6 FTF CONTACT INFORMATION*

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## 2 Metamodel Overview

### 2.1 KEY METAMODEL CONCEPTS

In order to best understand this document, it is important to understand some of the key concepts of enterprise architecture modeling.

The **metamodel** defines the kinds of information recorded in the Federal Transition Framework. The kinds of data the metamodel describes are called **entity types**. Entity types are analogous to tables in database theory or to classes in object-oriented theory. Conceptually related entity types are grouped together into **layers**, which are described in further detail below.

An entity type represents an important concept or abstraction of the enterprise architecture; they are the “nouns”. Each entity type contains one or more **attributes** describing the entity. Further, each entity type may be conceptually linked to one or more other entity types in a **relationship** of some kind. The entity types, attributes, and relationships can be represented in graphical notation using the Unified Modeling Language, as we have done in section 3 below. A brief overview of UML notation is provided as Appendix A to this document.

### 2.2 FTF CROSS-AGENCY INITIATIVES (CAIS)

FTF is not a comprehensive representation of all common architecture elements across the Federal government. Instead, the FTF’s primary focus is in organizing elements of federal cross-agency initiatives into a single, consistent and reusable architectural framework. Version 1.0 of the FTF contains 18 cross-agency initiatives (CAIs):

- Budget Formulation and Execution Line of Business
- Case Management Line of Business
- Disaster Management
- E-Authentication
- E-Travel
- Federal Health Architecture (FHA)
- Financial Management Line of Business
- Geospatial Line of Business
- Geospatial One-Stop
- Grants Management Line of Business
- Grants.gov
- HSPD-12
- Human Resources Line of Business
- Information Sharing Environment (ISE)
- Information Systems Security Line of Business
- Integrated Acquisition Environment (IAE)
- Internet Protocol Version 6 (IPv6)
- IT Infrastructure Optimization Line of Business

Additional CAIs will be incorporated into subsequent releases of the FTF.

## 2.3 FTF LAYERS

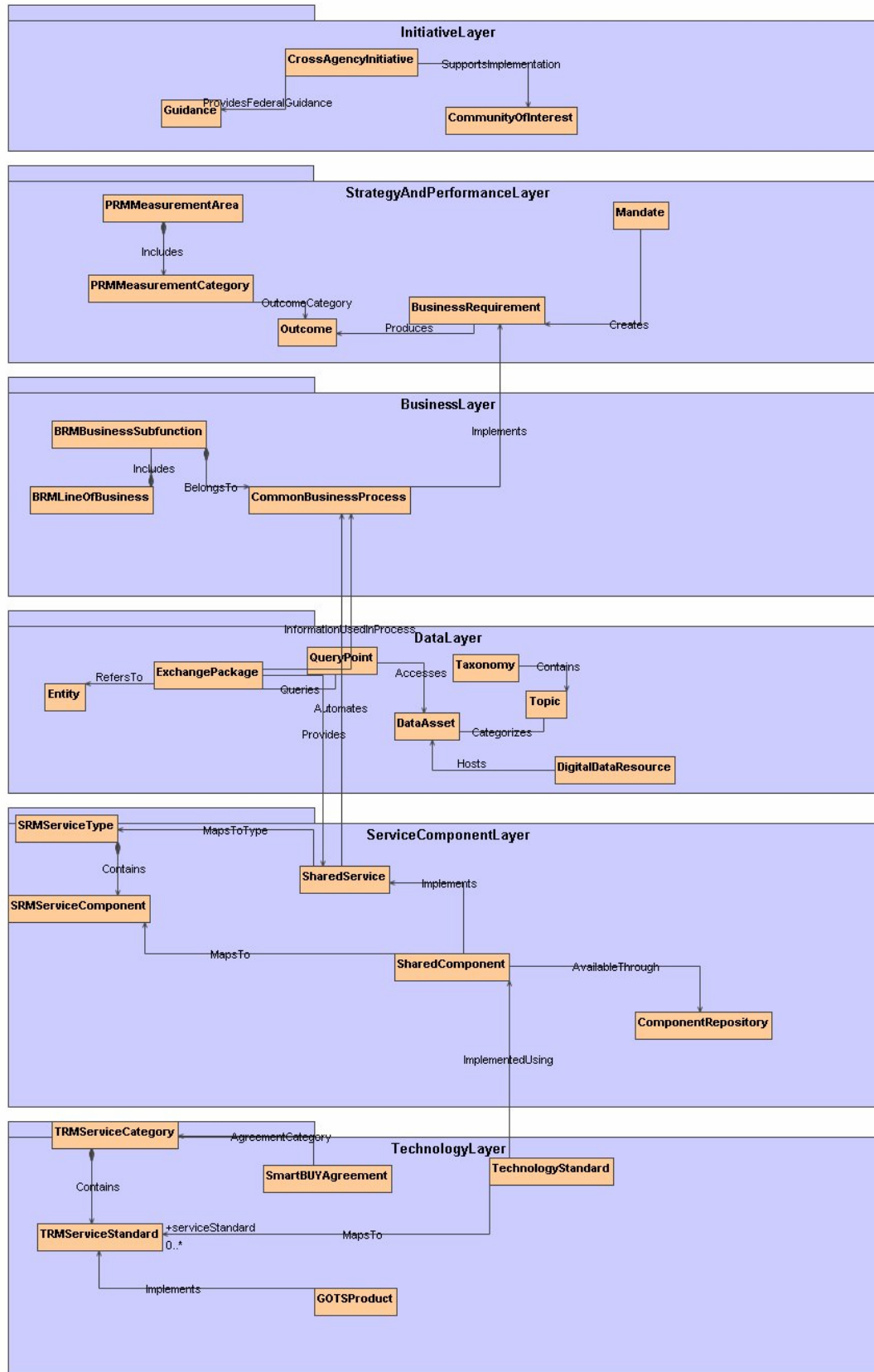
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A common characteristic of many enterprise architecture frameworks is their organization into layers, or perspectives. The Federal Enterprise Architecture Framework Reference Models defines five layers of an enterprise architecture (Performance, Business, Data, Service Component, and Technology). In addition to the five Reference Model layers, the design of the FTF also incorporates an additional layer to describe the Cross-Agency Initiative. As such, the FTF has six layers:

- **Initiative:** Describes a specific federal cross-agency initiative represented in the FTF, including approved implementation guidance for agencies and any communities of interest supporting the CAI.
- **Strategy and Performance:** Describes the outcomes, objectives and mandates representing the strategic goals of a given CAI, aligned to the FEA Performance Reference Model
- **Business:** Describes the common business processes and initiatives specific to the CAI, aligned to the FEA Business Reference Model
- **Data:** Describes the common information exchange packages, data repositories and standards of a given CAI, which are structured using the framework of the FEA Data Reference Model (version 2.0)
- **Service Component:** Describes the common shared IT services, components and component repositories specific to a given CAI, aligned to the FEA Service Component Reference Model
- **Technology:** Describes the common technology standards, government off-the-shelf products and shared licensing opportunities specific to a given CAI, aligned to the FEA Technical Reference Model

The following diagram provides an overview of the relationships among the layers, and the entity types existing within each layer. The layers are organized from top to bottom in the order described above.

Figure 1: The Federal Transition Framework





## 2.4 COMMON OBJECT ATTRIBUTES

There is a set of entity attributes common to all entity types in the FTF, with the exception of the BRM, PRM, SRM and TRM-derived types. These attributes are:

Attribute	Type	Description
Name	String	Instance name. Should be brief and natural, and it should uniquely identify the entity instance.
Description	String	Brief description of the entity instance
URL	String	Internet Uniform Resource Locator that provides additional information pertinent to a specific object within the FTF.

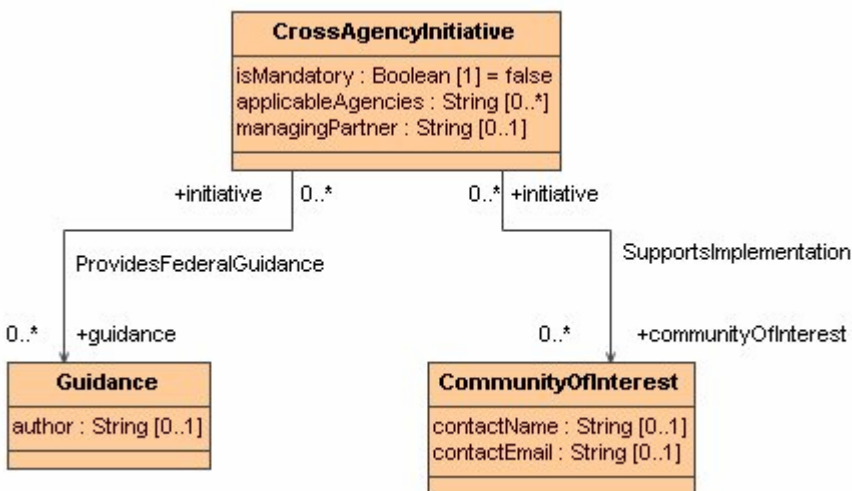
The common attributes will not be repeated in the descriptions unless there is a special provision for how the attribute is used with a particular entity.

## 3 FTF Metamodel Elements By Layer

### 3.1 INITIATIVE LAYER

The Initiative Layer describes important elements of common federal cross-agency initiatives including:

- The initiatives themselves
- Relevant sources of federal guidance
- Communities of interest within the Federal government providing support to agencies implementing the initiative



<b>Entity Name</b>	Cross-Agency Initiative (CAI)	
<b>Entity Description</b>	Describes a common federal initiative or IT management requirement	
<b>Examples</b>	IPv6, IT Infrastructure Optimization LOB, Grants LOB, e-Authentication Service Component	
<b>Entity Source</b>	OMB	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Mandatory / Informational	True/False	Agencies are expected to incorporate the FTF Catalog content for all CAIs designated as Mandatory, providing the CAI is relevant to the agency's lines of business (see "Applicable Agencies"), below. Non-Mandatory CAIs are designated as Informational, meaning agencies may elect to incorporate the FTF content for the CAI into their target architectures, but are not required to do so.
Applicable Agencies	String	Describes criteria to determine the federal agencies this initiative applies to
Managing Partner	String	Name of agency responsible for managing the

	cross-agency initiative
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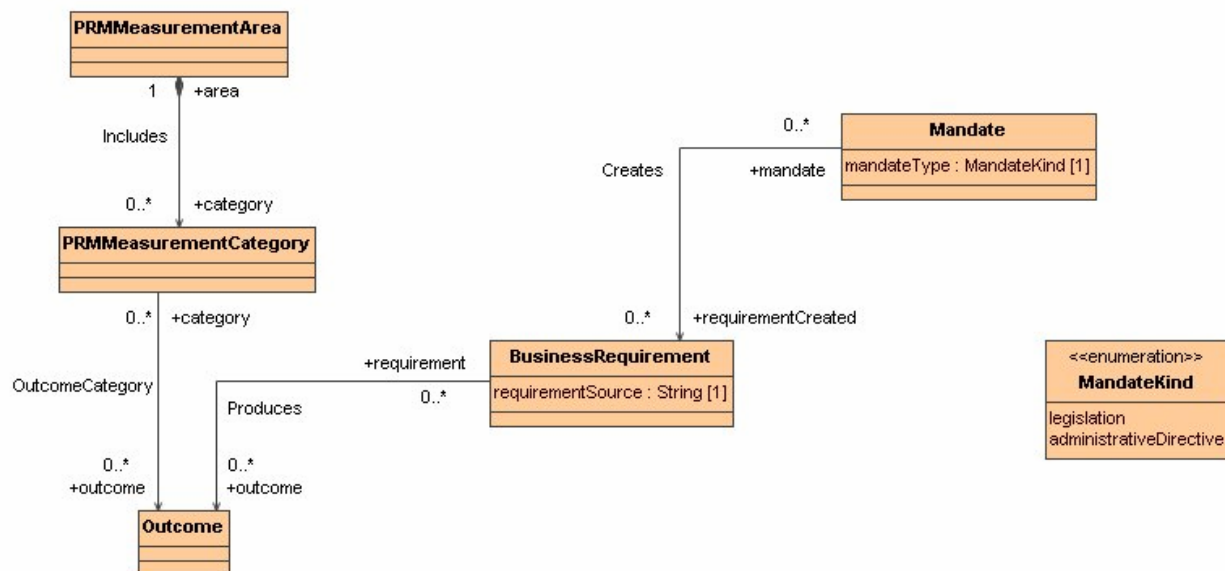
<b>Entity Name</b>	Guidance	
<b>Entity Description</b>	Document(s) providing approved federal guidance to federal agencies in implementing the CAI. The source of this guidance may be OMB, the CIO Council or other designated agencies or bodies.	
<b>Examples</b>	"Integrating IPv6 into Agency EA Planning" (pub. by the CIO Council)	
<b>Entity Source</b>	OMB, CIO Council	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Author	String	Organization responsible for producing guidance

<b>Entity Name</b>	Community of Interest	
<b>Entity Description</b>	Group established within the Federal government to promote and support implementation efforts for this CAI by Federal agencies	
<b>Examples</b>	AIC IPv6 Working Group	
<b>Entity Source</b>	Any Federal agency	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Contact Name	String	Individual contact for community
Contact E-Mail	String	E-mail address of contact

### 3.2 STRATEGY AND PERFORMANCE LAYER

The Strategy and Performance Layer describes important elements of CAIs including:

- Federal mandates for IT management and specific agency requirements associated with them
- Expected performance outcomes for the initiative, linked to the FEA Performance Reference Model



<b>Entity Name</b>	PRM Measurement Area	
<b>Entity Description</b>	Provides general groupings of measurement indicators within the Performance Reference Model (PRM)	
<b>Examples</b>	Mission and Business Results Measurement Area	
<b>Entity Source</b>	FEA Consolidated Reference Model	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

<b>Entity Name</b>	PRM Measurement Category	
<b>Entity Description</b>	Provides general classifications of measurement indicators within the Performance Reference Model (PRM)	
<b>Examples</b>	Community and Social Services, Defense and National Security	
<b>Entity Source</b>	FEA Consolidated Reference Model	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

<b>Entity Name</b>	Outcome	
<b>Entity Description</b>	Measurable agency performance outcome expected as a result of initiative. Performance improvements may be in the areas of business process improvements, cost savings and cost avoidance, technology implementation or other measures as enumerated within the PRM.	
<b>Examples</b>	"25% improvement in vaccination delivery schedule"	
<b>Entity Source</b>	Cross-Agency Initiative Managing Partner	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

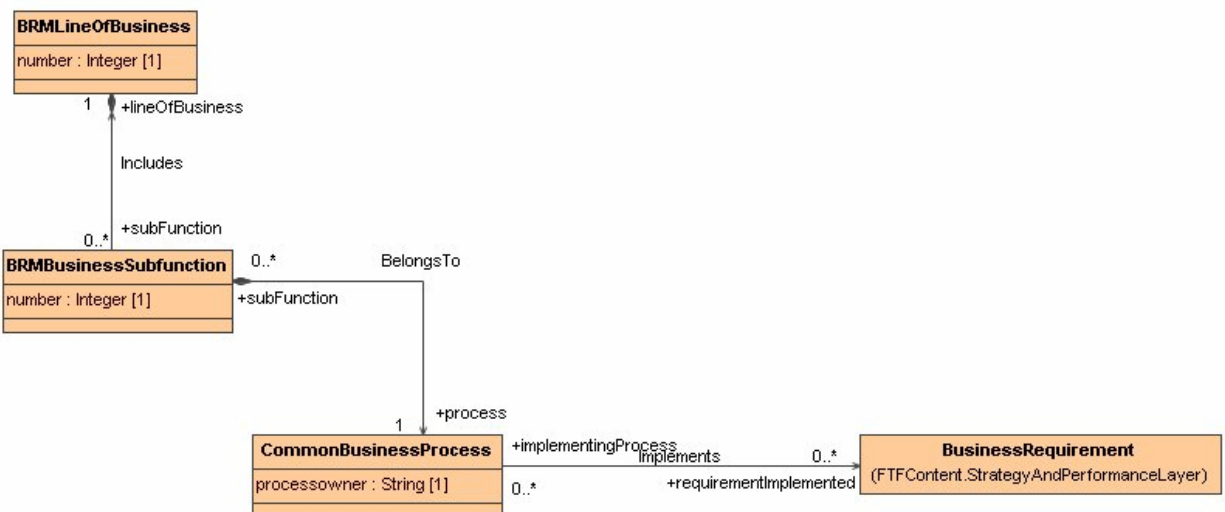
<b>Entity Name</b>	Mandate	
<b>Entity Description</b>	Federal legislation or administrative directive serving as a source for compliance requirements for Federal agencies	
<b>Examples</b>	E-Government Act, OMB Memorandum 05-22	
<b>Entity Source</b>	OMB, Congress, Policy Authority	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Type	Enumeration	Indicates whether mandate is a legislation or administrative directive

<b>Entity Name</b>	Business Requirement	
<b>Entity Description</b>	Specific agency requirement for compliance with this initiative deriving from a Mandate (see above). A Requirement describes a specific, measurable expectation for agency conformance.	
<b>Examples</b>	"...all agencies' infrastructure (network backbones) must be using IPv6, and agency networks must interface with this infrastructure, by June 30, 2008."	
<b>Entity Source</b>	OMB, Congress, Policy Authority	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Requirement Source	String	Mandate instituting the requirement

### 3.3 BUSINESS LAYER

The Business Layer encompasses entities and relationships pertaining to cross-agency business activities, including:

- Common cross-agency business processes defined by the CAI for their line of business
- Linkage to the FEA Business Reference Model
- Linkage to related strategic requirements, service components and information exchange packages



<b>Entity Name</b>	BRM Line of Business	
<b>Entity Description</b>	Provides a description of specific governmental lines of business	
<b>Examples</b>	Health, Homeland Security	
<b>Entity Source</b>	FEA Consolidated Reference Model	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Number	Integer	Unique identity code assigned by FEA to each line of business

<b>Entity Name</b>	BRM Business Subfunction	
<b>Entity Description</b>	Further decomposition of a line of business into smaller, more concrete functions	
<b>Examples</b>	Public Relations, Record Retention	
<b>Entity Source</b>	FEA Consolidated Reference Model	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Number	Integer	Unique identity code assigned by FEA to each subfunction

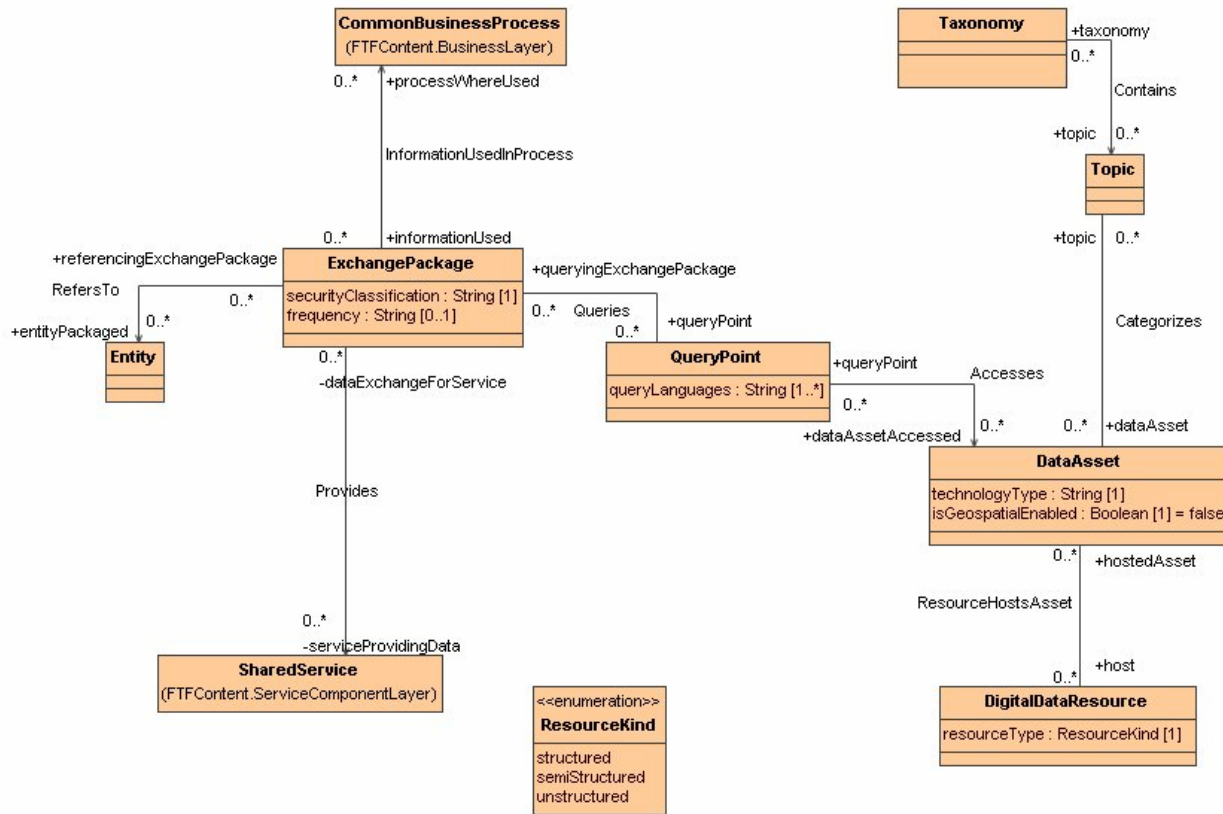
<b>Entity Name</b>	Common Business Process	
<b>Entity Description</b>	An activity performed by agencies yielding a result of measurable value to one or more stakeholders. Each BRM Business Subfunction can be further decomposed into multiple business processes	
<b>Examples</b>	"IPv6 Address Space Acquisition"	
<b>Entity Source</b>	Cross-Agency Initiative Task Force	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Process Owner	String	Agency formally charged with ownership of the common process

### 3.4 DATA LAYER

The Data layer encompasses entities and relationships pertaining to data exchanged as part of a common business process, including

- Information exchange packages defining the format for data sharing
- Data resources such as databases, containing common federal data
- Data taxonomies for the cross-agency initiative

All of the entity types defined within the FTF Data Layer are defined within the FEA Data Reference Model 2.0. The entity type descriptions and attributes are taken directly from the DRM.



<b>Entity Name</b>	Taxonomy	
<b>Entity Description</b>	A collection of controlled vocabulary terms organized into a hierarchical structure. Taxonomies provide a means for categorizing or classifying information within a reasonably well-defined associative structure. Each term in a taxonomy is in one or more parent/child (broader/narrower) relationships to other terms.	
<b>Examples</b>	A taxonomy expressed in W3C Web Ontology Language (OWL) format.	
<b>Entity Source</b>	FEA Data Reference Model 2.0	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

<b>Entity Name</b>	Topic	
<b>Entity Description</b>	A category within a Taxonomy. A Topic is the central concept for applying context to data. For example, an agency may have a Taxonomy representing their organizational structure. In such a Taxonomy, each role in the organizational structure (e.g. CIO) represents a Topic. Topic is often synonymous with “node”.	
<b>Examples</b>	Country	
<b>Entity Source</b>	FEA Data Reference Model 2.0	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

<b>Entity Name</b>	Data Asset	
<b>Entity Description</b>	A managed container for data. In many cases, this will be a relational database; however, a Data Asset may also be a Web site, a document repository, directory or data service.	
<b>Examples</b>	Relational databases, web services, directory, document repository	
<b>Entity Source</b>	FEA Data Reference Model 2.0	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Type	String	Type of Data Asset – e.g. database, Web site, registry, directory, data service, etc.
Geospatial Enabled	True/False	Designates whether or not the Data Asset supports or provides Geospatial data.

<b>Entity Name</b>	Digital Data Resource	
<b>Entity Description</b>	A digital container for information, which may be stored in structured, semi-structured or unstructured forms	
<b>Examples</b>	Relational databases, semi-structured data files, unstructured documents	
<b>Entity Source</b>	FEA Data Reference Model 2.0	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Type	Enumeration	Type of Resource – structured, semi-structured or unstructured

<b>Entity Name</b>	Query Point	
<b>Entity Description</b>	An endpoint providing an interface for accessing and querying a Data Asset. A concrete representation of a Query Point may be a specific URL at which a query Web Service may be invoked. A Query Point returns a result set specified in an Exchange Package.	
<b>Examples</b>	"http://www.example.com/querypoint3"	
<b>Entity Source</b>	FEA Data Reference Model 2.0	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Query Languages	String	A stipulation of the query languages supported by a Query Point (e.g. SQL-92, CQL (Z39.50), XQuery, HTTP GET, etc.).



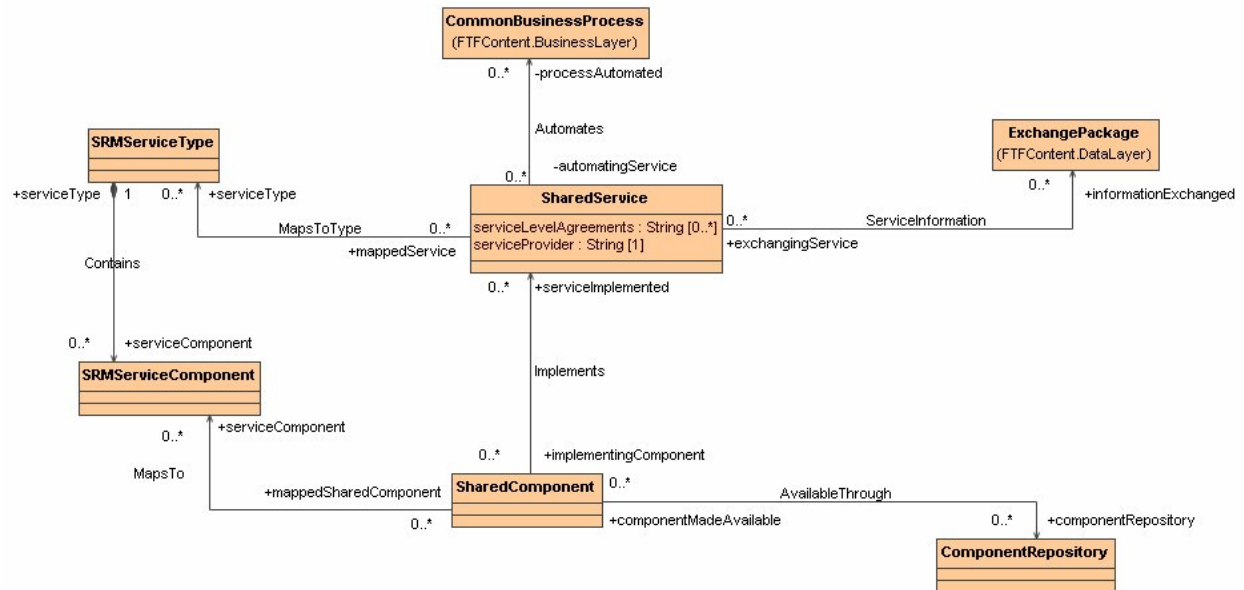
<b>Entity Name</b>	Exchange Package	
<b>Entity Description</b>	A description of a specific recurring data exchange between a supplier and a consumer. An Exchange Package contains information (metadata) relating to the exchange (such as Supplier ID, Consumer ID, validity period for data, etc.), as well as a reference to the Payload (message content) for the exchange. An Exchange Package can also be used to define the result format for a query accepted and processed by a Query Point in a data sharing scenario.	
<b>Examples</b>	Electronic Healthcare Record	
<b>Entity Source</b>	FEA Data Reference Model 2.0	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Classification	String	The security classification for an Exchange Package.
Frequency	String	The frequency at which the exchange occurs

<b>Entity Name</b>	Entity	
<b>Entity Description</b>	An abstraction for a person, place, object, event, or concept described (or characterized) by common Attributes. For example, "Person" and "Agency" are Entities. An instance of an Entity represents one particular occurrence of the Entity, such as a specific person or a specific agency.	
<b>Examples</b>	Person, Agency	
<b>Entity Source</b>	FEA Data Reference Model 2.0	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

### 3.5 SERVICE COMPONENT LAYER

The Service Component Layer encompasses entities and relationships pertaining to shared IT services and components utilized by the CAI, including:

- Shared IT services (e.g., Grants.gov)
- Potentially shareable service components (e.g., e-Authentication)
- Relevant Federal repositories of components for this CAI (e.g., Core.gov)



<b>Entity Name</b>	SRM Service Type	
<b>Entity Description</b>	Defines the second level of detail describing a business-oriented service	
<b>Examples</b>	Tracking and Workflow, Routing and Scheduling	
<b>Entity Source</b>	FEA Consolidated Reference Model	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

<b>Entity Name</b>	SRM Service Component	
<b>Entity Description</b>	A self contained business process or service with predetermined functionality exposed through a business or technology interface	
<b>Examples</b>	Process Tracking, Case Management, Conflict Resolution	
<b>Entity Source</b>	FEA Consolidated Reference Model	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

<b>Entity Name</b>	Shared Service	
<b>Entity Description</b>	Federal e-government implementations such as Line of Business Centers of Excellence or other services shared across multiple agencies	
<b>Examples</b>	HR Centers of Excellence	
<b>Entity Source</b>	Line of Business or E-Government Initiative	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Service Level Agreements	String	Description of service level agreements established for this service
Service Provider	String	Name of organization providing the shared service

<b>Entity Name</b>	Shared Component	
<b>Entity Description</b>	Logical “building blocks” of a shared service	

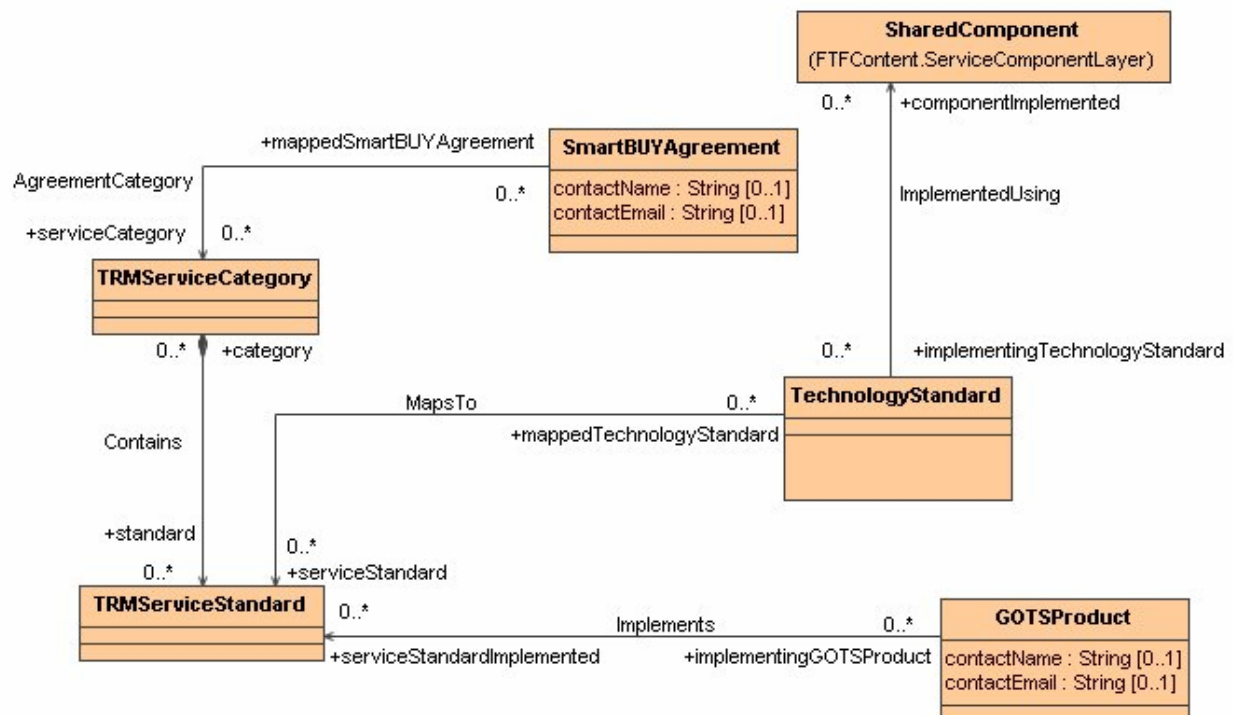
<b>Examples</b>	e-Authentication	
<b>Entity Source</b>	Line of Business or E-Government Initiative	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

<b>Entity Name</b>	Component Repository	
<b>Entity Description</b>	Online service hosting components for reuse by federal agencies	
<b>Examples</b>	CORE.gov	
<b>Entity Source</b>	Line of Business or E-Government Initiative	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

### 3.6 TECHNOLOGY LAYER

The Technology Layer encompasses entities and relationships pertaining to common Federal technology infrastructure elements, including:

- Technology specifications, including NIST standards and approved industry standards
- Government off-the-shelf (GOTS) applications
- Approved SmartBUY licensing agreements for this CAI



<b>Entity Name</b>	TRM Service Category
<b>Entity Description</b>	Used to classify lower levels of technologies, standards, and specifications in respect to the business or technology function they serve

<b>Examples</b>	Access Channels, Service Transport	
<b>Entity Source</b>	FEA Consolidated Reference Model	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

<b>Entity Name</b>	TRM Service Standard	
<b>Entity Description</b>	Used to define the standards and technologies supporting the Service Category	
<b>Examples</b>	Web Browser, Wireless/PDA	
<b>Entity Source</b>	FEA Consolidated Reference Model	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

<b>Entity Name</b>	Approved Federal Technology Standard	
<b>Entity Description</b>	Approved federal technologies, standards, and specifications in respect to the business or technology function they serve	
<b>Examples</b>	NIST Standards, Voluntary Consensus Standards	
<b>Entity Source</b>	OMB	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
No additional attributes		

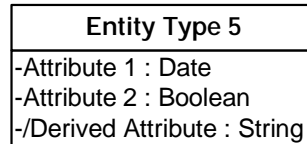
<b>Entity Name</b>	GOTS Product	
<b>Entity Description</b>	Government off-the-shelf technology products agencies can utilize without the payment of license fees. <i>Note:</i> the inclusion of a GOTS product within the FTF does not mandate agencies adopt this product or prefer it to a commercial product (unless otherwise specified); it merely indicates a product is available for usage by agencies should they elect to do so	
<b>Examples</b>	e-CPIC	
<b>Entity Source</b>	Any Federal agency	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Contact Name	String	Individual contact for product
Contact E-Mail	String	E-mail address of contact

<b>Entity Name</b>	SmartBUY Agreement	
<b>Entity Description</b>	Government-wide blanket purchase agreement for specific vendors approved under the OMB SmartBUY program	
<b>Examples</b>	Prosight, Oracle	
<b>Entity Source</b>	OMB	
<b>Unique Attributes</b>	<b>Type</b>	<b>Description</b>
Contact Name	String	Individual contact for agreement
Contact E-Mail	String	E-mail address of contact

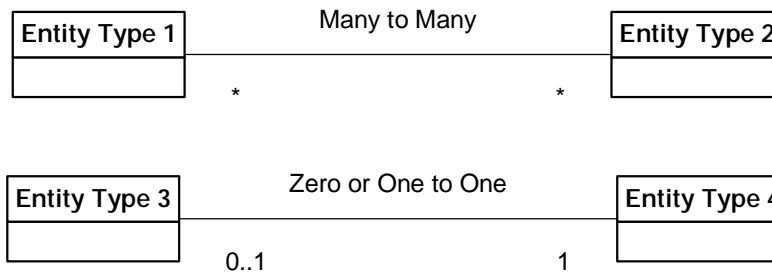
## Appendix A: Documenting the FTF Metamodel

The metamodel diagrams below follow Unified Modeling Language (UML) standard. Here are a few notes on the UML notation.

- Entity types (classes) are shown as rectangles. Attributes are listed inside the rectangles.



- Relations (associations) are shown as lines; Relationship multiplicity, i.e., one-to-many, many-to-many, etc. is shown with a cardinality symbol at each end of a relationship. Cardinality can be shown as a range ("0..1"), a number ("1"), or as "\*" meaning "0 or many".



- An aggregation is a one-to-many relationship. It uses the symbol of a line with a diamond in the aggregate end. A black diamond represents containment which is a strict "part-of" relationship. An open diamond is the general aggregation, which allows aggregates to share elements.

