



Life Cycle Data Management

Life Cycle Data Management for Japanese construction field

– Research Reports on Registry in US –

The 3rd Asia Construction IT Round Table Meeting
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Date: 02/08/07

Name: Takeya ISOBE

Organization: Former LCDM Forum, CTI Engineering Co., Ltd.



Agenda

Life Cycle Data Management

1. LCDM Overview

2. Research on US Main Registries

2-1. Summary of Research

2-2. FAA

2-3. EPA

2-4. NCI

3. Metadata Open Forum in NY '07

LCDM is:

General concept of data sharing and system collaboration all through the construction lifecycle, not only execution process, but also maintenance process of completed objects.

*LCDM: Life Cycle Data Management

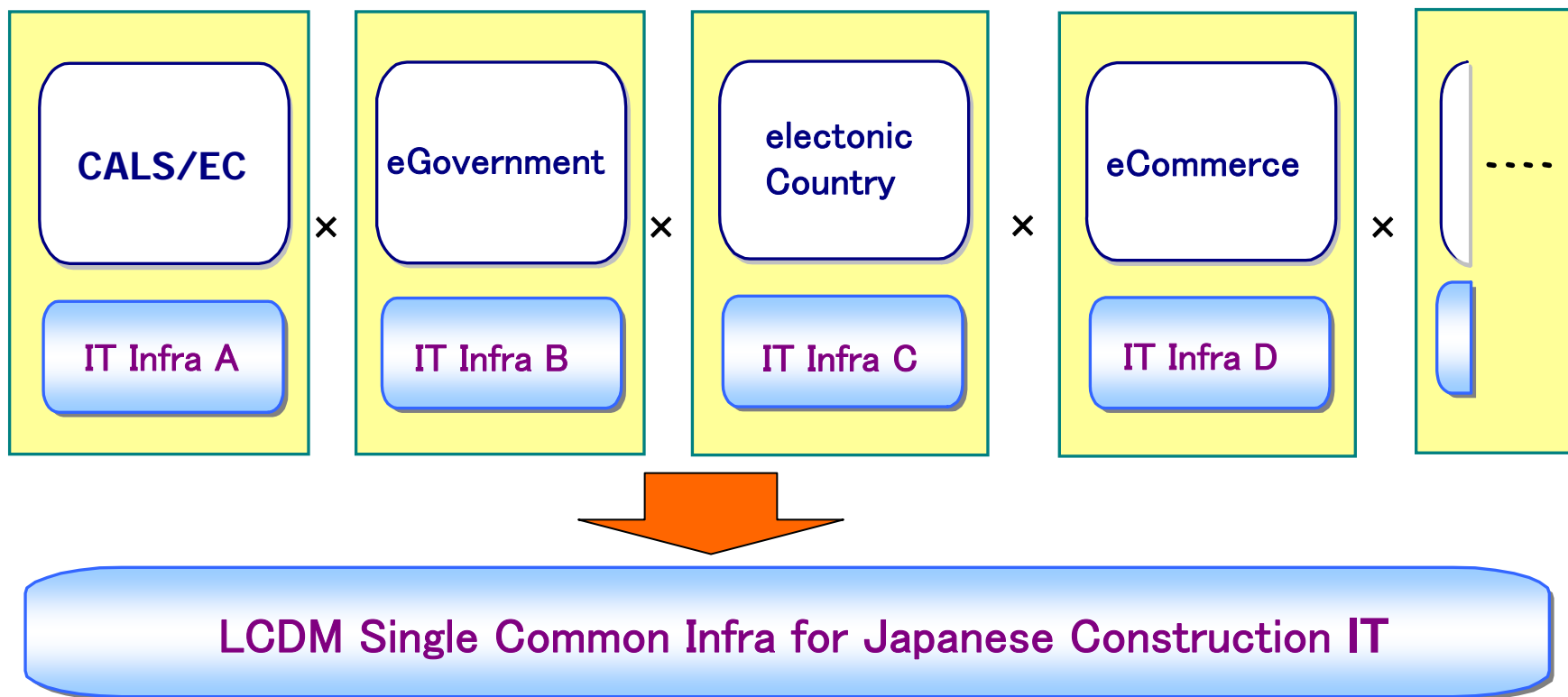
Goals are:

To develop specification of data standards and information infrastructure, on which standardized data are registered, updated, and made effective use of, in order to promote data standards and make information investment efficient.

1-1. Background

Life Cycle Data Management

- Specific non-consistent IT standards and systems, in diverse fields of Japanese construction
- Increase of needs for data sharing and reuse, all through the lifecycle of social infrastructures



1-2. Activities on LCDM

LCDM Forum

Non-profit task force led by private companies established in Feb.2005

- Members; Construction industry, IT industry, and public sectors, totally 38 members
- Finished two years term on Feb.2007 as planned on the first

Concept adopted to Governmental Policy

MLIT announced 'Innovation 25' a new IT Policy on 25th May, 2007 in which the concept of LCDM was adopted.

LCDM Registry

- To make visible who, what, and where about data specification
- A single LCDM Registry may be allowed in construction field
- Registration to the registry goes through human examination

LCDM Portal

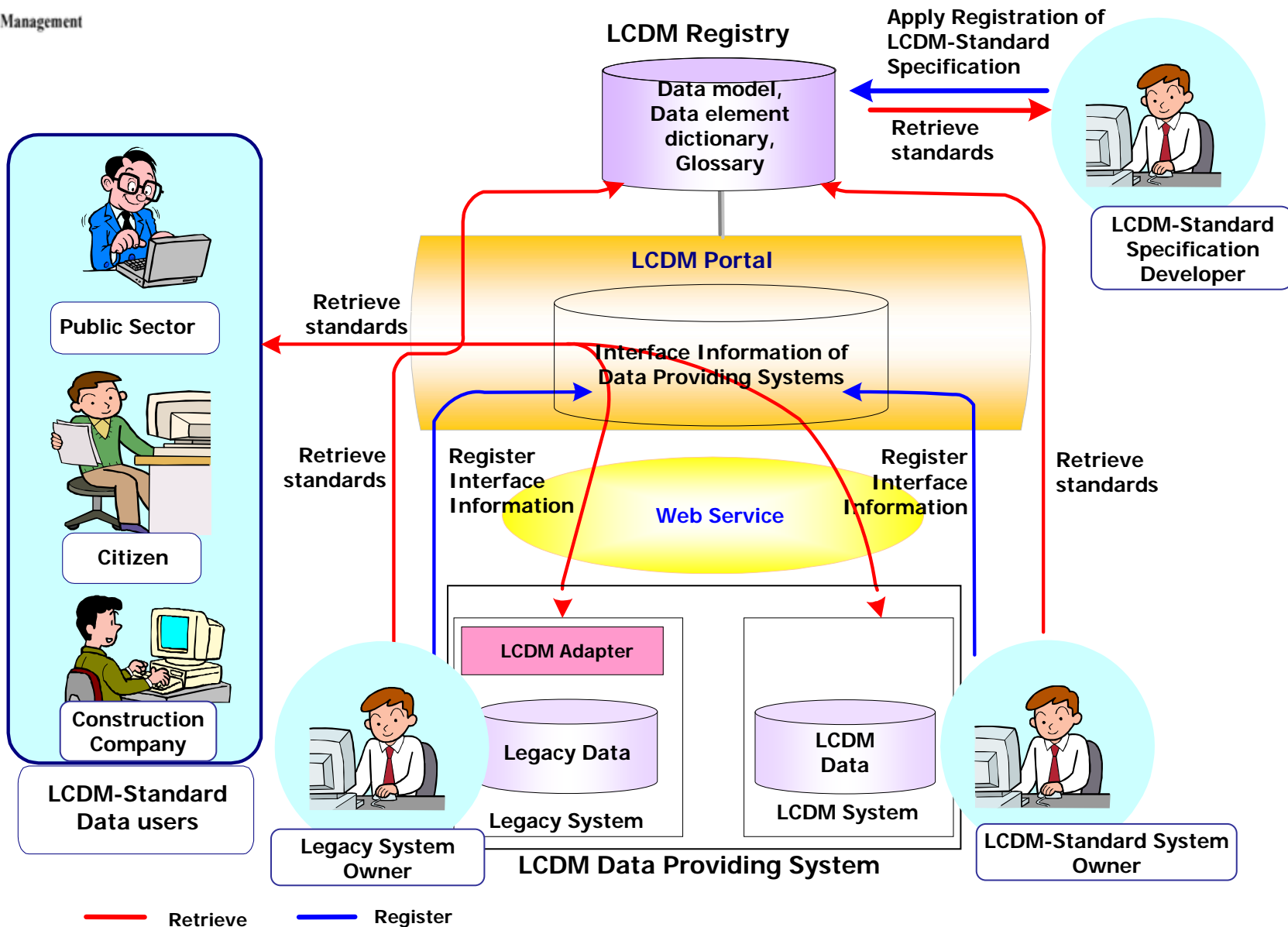
- To provide data to users
- Users access Portals to search and retrieve raw data

LCDM Adapter

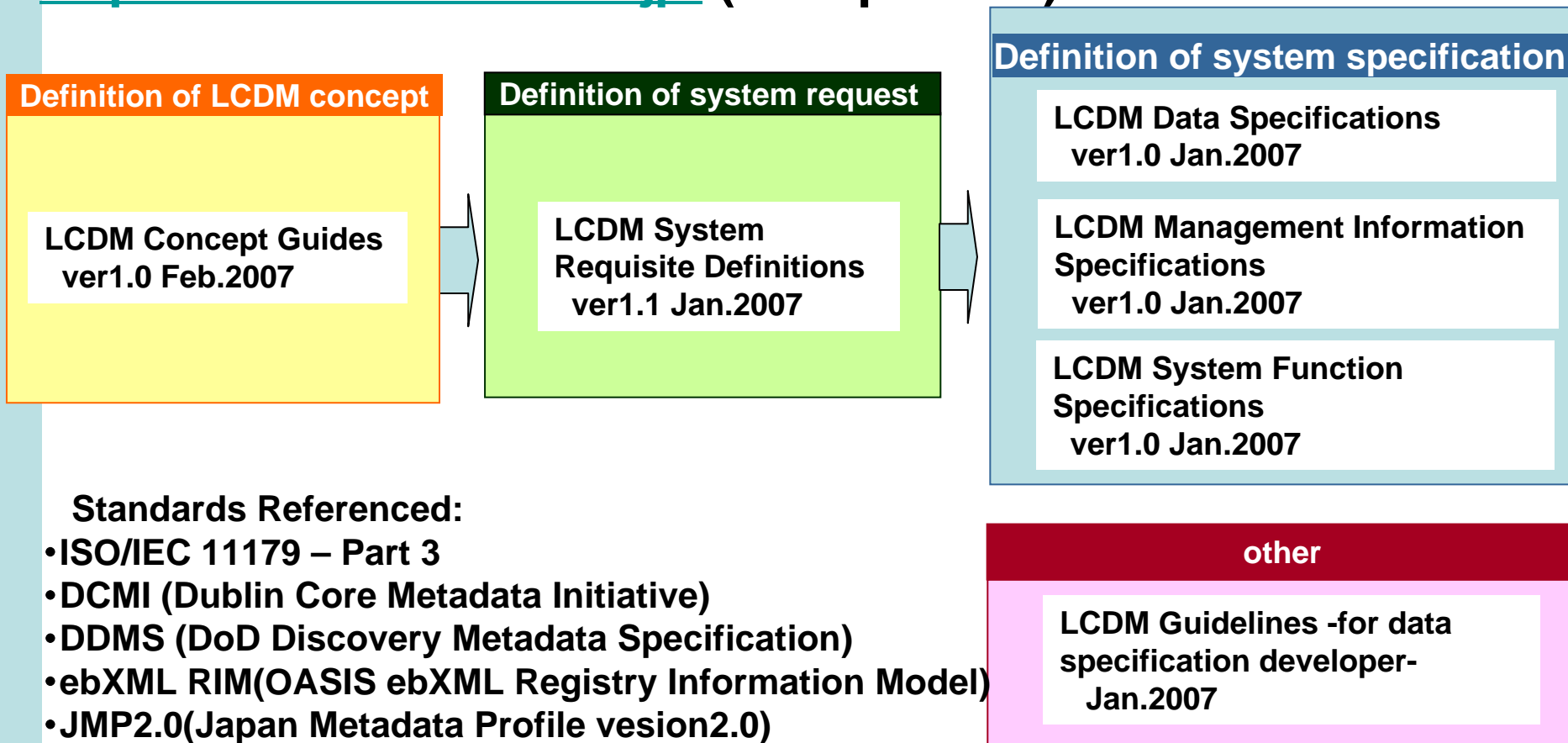
- To transform non-standard data such as legacy data into LCDM-standard XML data

1-4. Concept of LCDM System(2/2)

Life Cycle Data Management



You can download more than 600 pages from
<http://www.lcdm-forum.jp/> (in Japanese)



Standards Referenced:

- ISO/IEC 11179 – Part 3
- DCMI (Dublin Core Metadata Initiative)
- DDMS (DoD Discovery Metadata Specification)
- ebXML RIM(OASIS ebXML Registry Information Model)
- JMP2.0(Japan Metadata Profile vesion2.0)

2. Research on US Main Registries

JACIC sent a delegation composed of officers of MLIT, members from LCDM Forum and JACIC last November to research US 5 main registries.

Such as,

- ◆ FAA: Federal Aviation Administration
<http://fdr.gov/fdr/Home.jsp>
- ◆ USHIK: United States Health Information Knowledgebase
<http://www.ushik.org/registry/x/>
- ◆ VHA: Veterans Health Administration
<http://www1.va.gov/health/>
- ◆ NCI: National Cancer Institute
<http://ncicb.nci.nih.gov/>
- ◆ EPA: Environmental Protection Agency
<http://www.epa.gov/sor/>

Reasons Why Registries

- Business Process Re-engineering and improvement of public service
- Efficient data management
- Cost-down of system development

Development of Registries

- Based on ISO/IEC 11179, but not exactly
- Use cases of commercial off the shelf products (FAA and so on)
- Immigration and re-use cases of registry system (EPA→VHA)

2-1-2. Summary of the Research-2

Governmental Policy

- **Building** Registries as social infrastructures **by public budget**
- **Operated by official agencies** to secure neutrality and liability

Real Operation

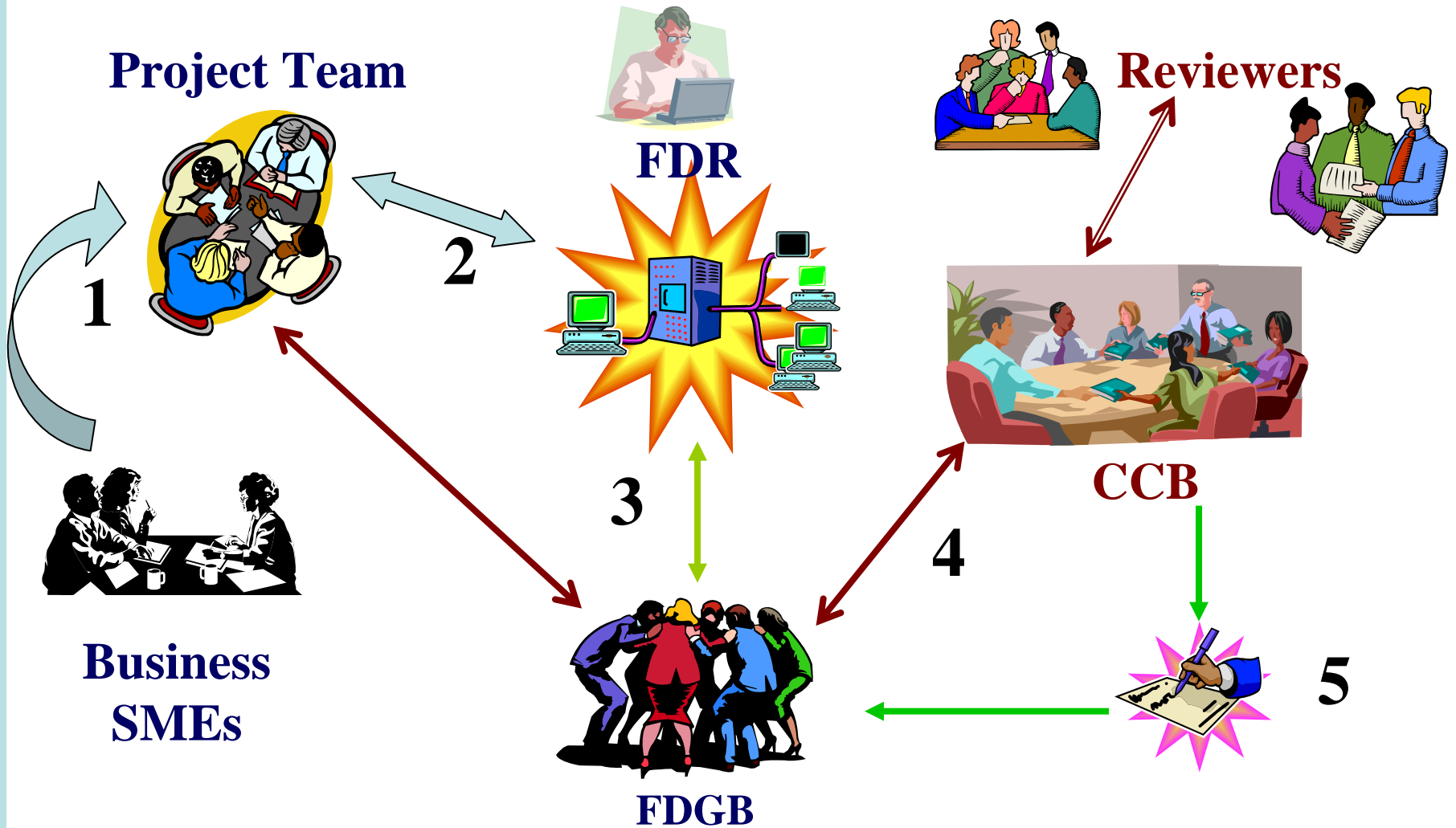
- Quality and status control of posted specifications is processed through human procedures
- In some cases, Incentive is given by controlling budget for system development depended on usage of registries
- Even these advanced registries are not yet completed, and are still on the way of development

2-2-1.FAA Registry - What is it?

- A commercial off the shelf product (OneData Registry) developed by Data Foundations for implementation of ISO/IEC 11179.
- A web based system to publish, distribute, and maintain aviation data standards and their related classification schemes.
- A system to provide information about the precise meaning of standards.
- A place to capture information during the development and processing of data standards.
- FAA recently acquired OneData(COTS) in early 2006.

2-2-2.FAA Data Standardization Process

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2-3-1.EPA: System of Registries

System of Registries www.epa.gov/sor/

U.S. Environmental Protection Agency



System of Registries

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Welcome to the System of Registries,
the Foundation of EPA's Integration of Environmental Information



The System of Registries (SoR) provides a gateway and search capability to several registries and repositories residing in the Environmental Protection Agency's (EPA) Office of Environmental Information (OEI). These registries comprise a critical link in EPA's information architecture and are a vital component to the National Environmental Information Exchange Network (Network). Specifically, the SoR was developed to support the Agency's data standards program and numerous Agency information technology initiatives, including the Agency architecture and data exchange with stakeholders through network nodes.

The registries provide identification information for objects of interest to EPA, Network trading partners, including states and tribal entities, and the public. These objects consist of data elements, XML tags, data standards, substances (chemicals, biological organisms, and physical properties), terms, facilities, regulations, and data sets that the Agency uses in its core business processes. You may scroll down to directly access any of these registries/repositories.



Environmental Data Registry (EDR)

Data Standards, XML, and Application Metadata

EDR is a comprehensive, authoritative source of reference information (metadata) about environmental data. The EDR [Search](#) page includes queries for EPA [data standard](#) and application metadata such as data elements, XML tags, and value domains.



Facility Registry System (FRS)

Facility Identification Information

FRS is a centrally managed database that identifies facilities, sites, or places subject to environmental regulations or of environmental interest. The [FRS Query Form](#) allows users to search for facilities that are in the [Envirofacts Warehouse](#) and through the FRS record to retrieve selected environmental data contained in the national program systems.



Registry for EPA Applications and Databases (READ)

EPA's Application Inventory, Organization Hierarchy, and Other Information Resources

READ is an authoritative source of information about Environmental Protection Agency (EPA) application systems and other information resources. The READ [Search](#) page includes queries for Agency application system, organization, and other information resource metadata.



Substance Registry System (SRS)

Chemicals, Biological Organisms, and Miscellaneous Substances

SRS serves as the nucleus for linking information about substances regulated by the EPA. The SRS [Search](#) page includes queries for substances (such as chemicals, organisms, and physical characteristics) in EPA regulations, data systems, and other information resources.



XML Registry

XML Schemas, Namespaces, and Supporting Files

The interim XML Registry for the [Environmental Information Exchange Network](#) [EXIT disclaimer](#) provides the capability to share information about XML Data Exchange Template (DETs), XML Schemas, Namespaces, WSDL files, and other supporting files needed to map data flows between partners. The Registry will contain information about schemas approved for use on the Network, as well as information about schemas under development. In time, the XML Registry will provide a clearinghouse for information related to data flows on the Network. The data may also be found in the [EDR](#) and [READ](#).



Environmental Information Management System (EIMS)

Data Sets, Models, and Spatial Data

EIMS contains descriptive information (metadata) on scientific data sets, including remote sensing data, Geographical Information System (GIS) coverages, databases, documents, models, and multimedia. EIMS also provides a repository for scientific documentation that can be easily accessed with standard Web browsers to place a virtual library on the desktop of EPA staff and others with Internet access. The EIMS [Search](#) allows query by Information Type, Subject / Keyword, Cross Partner Collection, or EIMS Partner.



Terminology Reference System (TRS)

Environmental Terms and Definitions

TRS provides a single resource of environmental terminology for the EPA by compiling collections of terms from the Agency and other sources. TRS contains collections of environmental terms and definitions from a variety of sources including Agency program offices, information systems, and state collections. The TRS [Search](#) page includes queries for terms and definitions by keyword, information resource, and organization.

Updates and Features

EDR: Updated Tribal Identifier and E/C Data Standards to Final Data Standards.

FRS: Data refreshed for CERCLIS, RCRAInfo, and GICS.

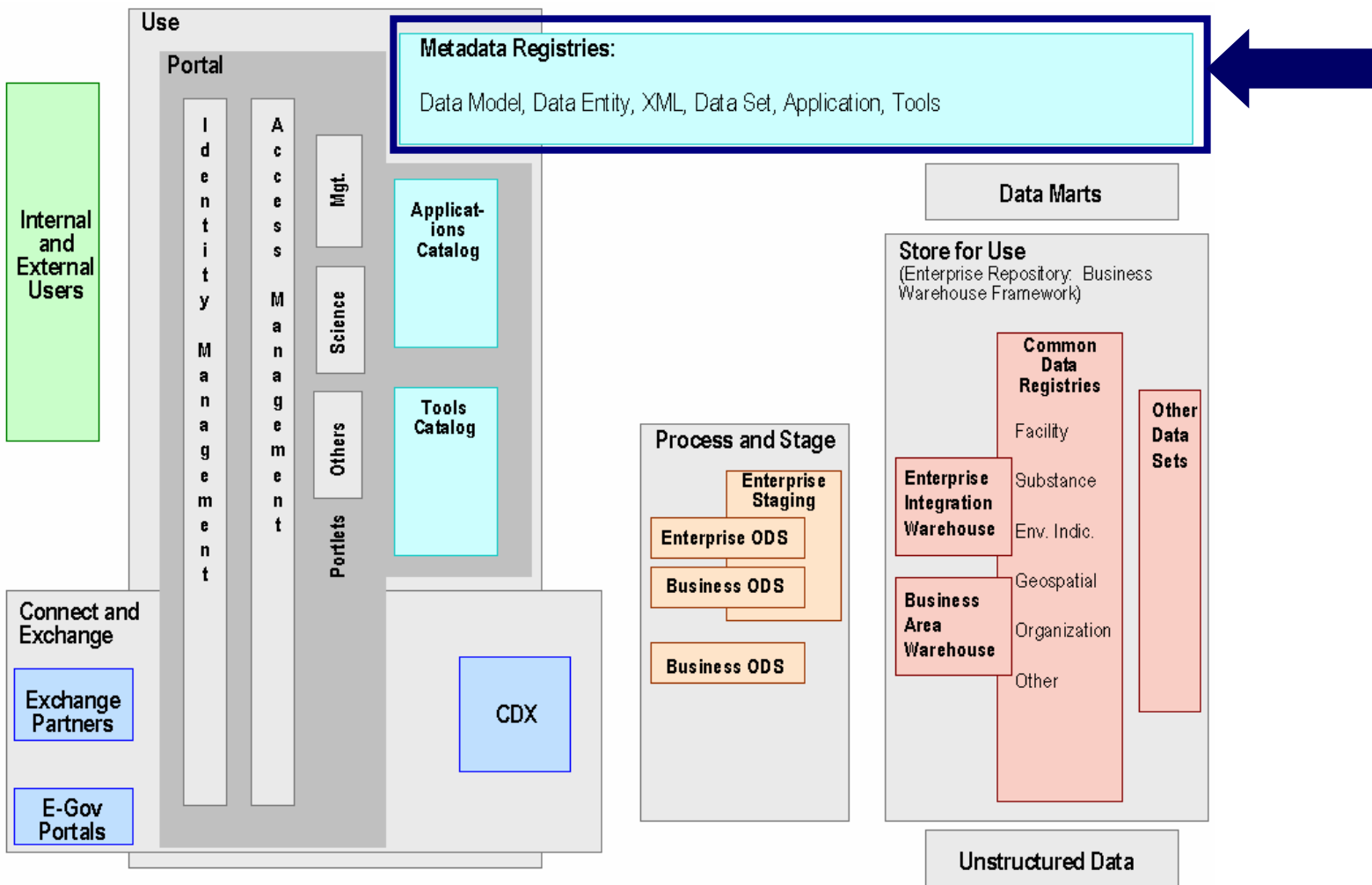
READ: The name of the Information Resource Registry System (IRRS) has been changed to the Registry for EPA Applications and Databases (READ).

SRS: CRS and BioRS now fully integrated in SRS. New data loads for STORET, NEI, AQS, and EPA Registry Names.

XML: A new tool for accessing information about XML schemas, DETs, and supporting files for the Environmental Information Exchange Network. The data may also be found in the [EDR](#) and [READ](#).

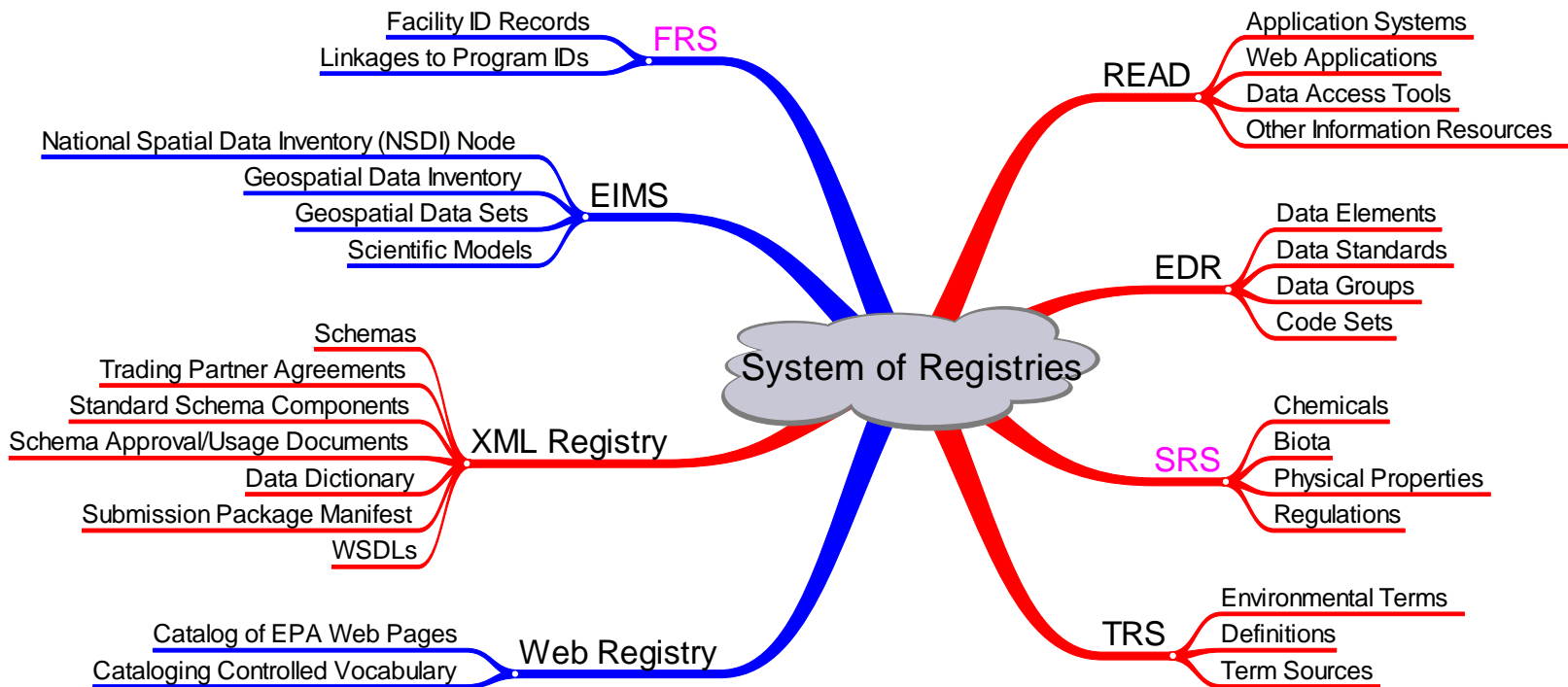
2-3-2.EPA: Target Architecture

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Source: *Enterprise Architecture Status Report* – Sept. 2003

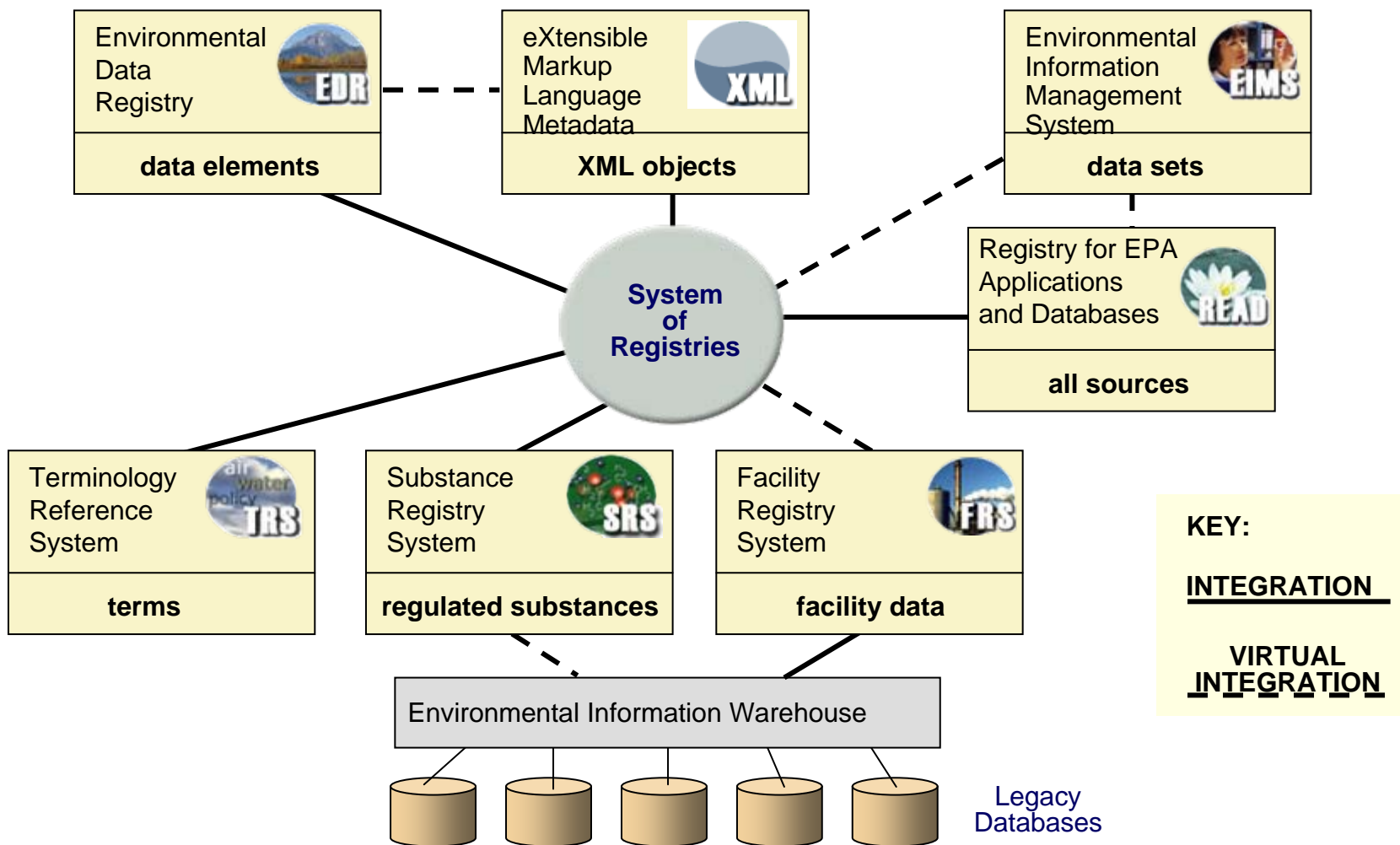
2-3-3.EPA:Current System of Registries



Black = Metadata Registry
 Lilac = Business Object Registry

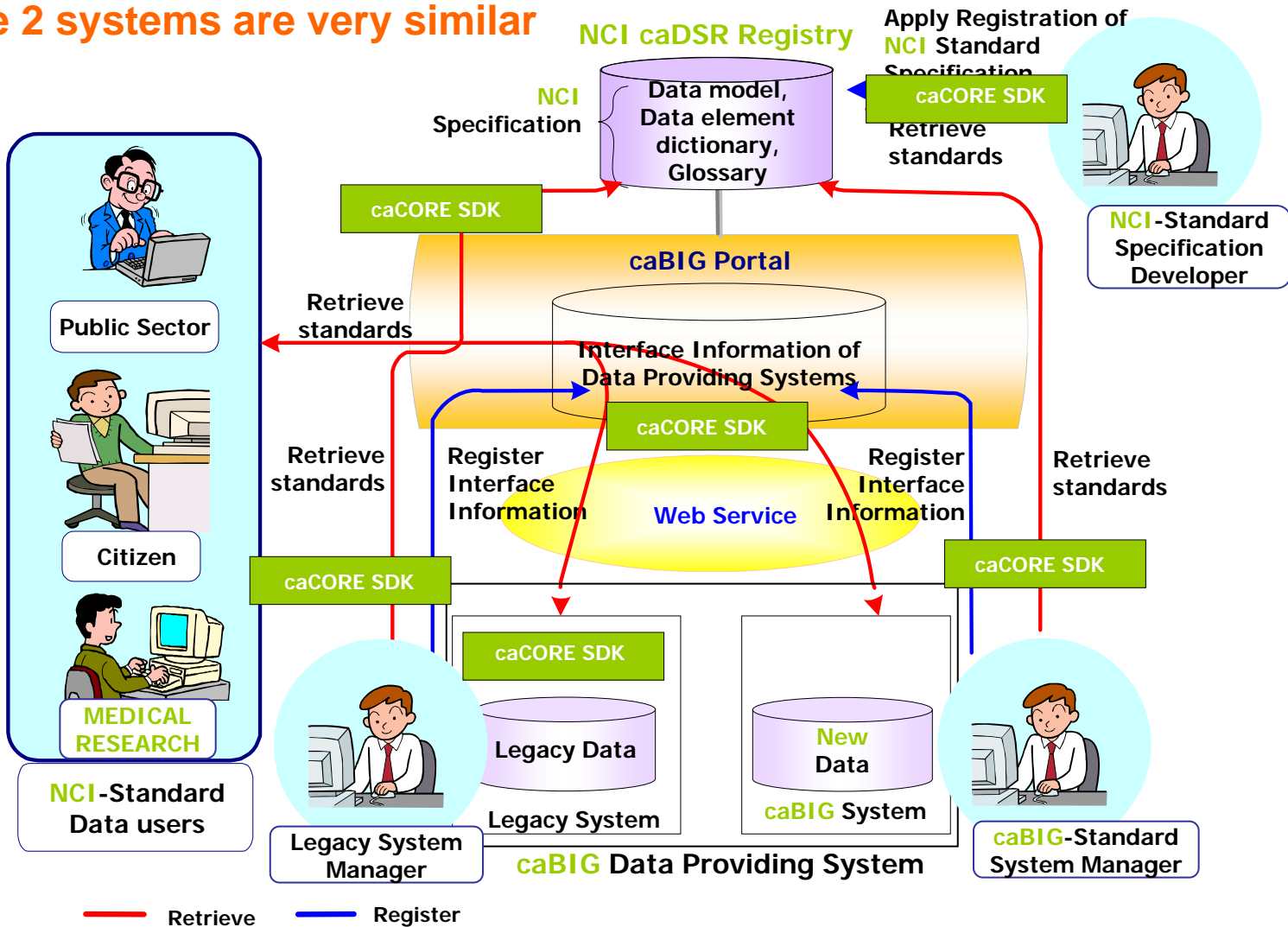
Blue = Virtual Linkage
 Red = Integrated Registry

2-3-4.EPA:Virtual Integration



2-4-1. NCI versus LCDM system

The 2 systems are very similar



2-4-2.NCI:Cancer Common Ontologic Representation Environment (caCORE)

- caCORE is the open-source foundation upon which the NCICB builds its research information management systems



Bioinformatics Objects



**Common Data Elements
MDR**



Enterprise Vocabulary

**S
E
C
U
R
I
T
Y**

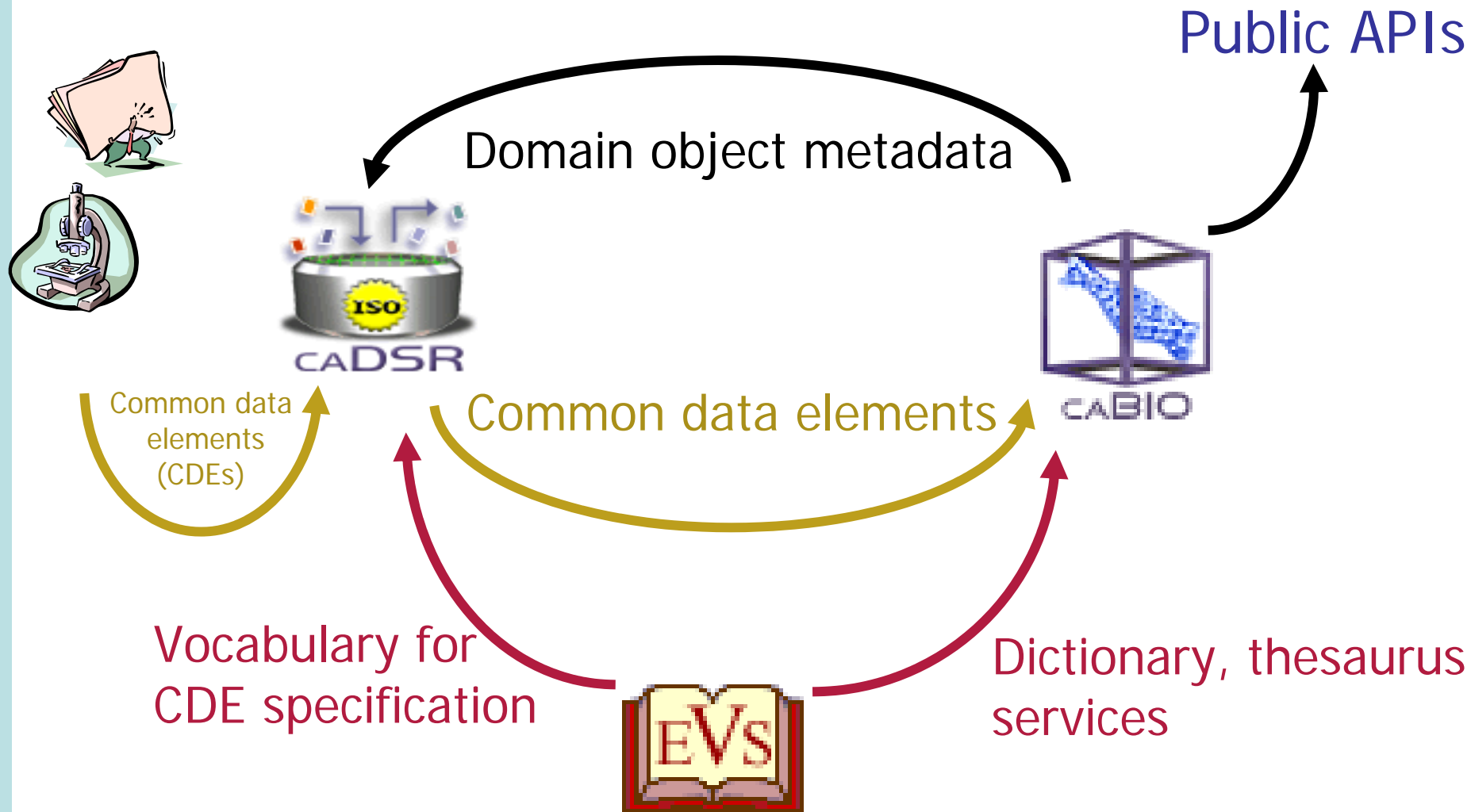
2-4-3.NCI:Semantic Interoperability

Ability of a system to
access and use the parts
or equipment of another
system

Syntactic
interoperability

Semantic
interoperability

2-4-4.NCI:caCORE SDK Infrastructure



2-4-5.NCI:Use of Open Tools

Outside use of NCI open tools

The Nordic CDE (Iceland) has used the caDSR tools for their registry.

Such as:

- caDSR Admin Tool and Database
- CDE Browser
- Curation Tool

Other users:

The Lockheed Martin company

Several software development companies

3. Metadata Open Forum in New York '07

10th Open Forum on Metadata Registries

- Place; New York City, NY USA**
- Date; 9 - 11 July 2007**
- Participants; About 100 people**
USA, Canada, UK, Iceland, China,
Korea, Australia, Japan etc.
- Organization Fields**
Aeronautics, Science, Environment,
Engineering, Sales, Construction,
Medical-care, Manufacturing etc.

<http://metadataopenforum.org/index.php?index>

Organization operating Registry

US, Canada

- EPA Environmental Protection Agency
- NCI National Cancer Institute
- USHIK United States Health Information Knowledgebase
- FAA Federal Aviation Administration
- VHA Veterans Health Administration
- US Census Bureau
- DoD Department of Defense
- STC Statistics Canada

EU

- EEA EIONET European Environmental Agency Data Dictionary
- ITS Registry United Kingdom Highways Agency
- Icelandic Cancer Center

Others

- METeOR Australian Institute of Health and Welfare Metadata Online Registry



Contact Us

Secretary of Former LCDM Forum

3-21-1 Nihombashi Hamacho, Chuo-ku, Tokyo, 103-8430, Japan

lcdm@ctie.co.jp

<http://www.lcdm-forum.jp>