



International **Dictionaries** **(Interoperability)**

The Participants

- IEC
 - ◆ SC3D
 - ◆ TC93
- ISO
 - ◆ TC184
- Rosettsnet
- ECALS
- JEMA
- Merci
- OIIDI



LATEST NEWS**68th IEC General Meeting**

Seoul, Republic of Korea
2004 October 17-22

- ▶ [Web site & registration](#)
- ▶ [Programme \(PDF, 647 KB\)](#)

**2004-08-23**

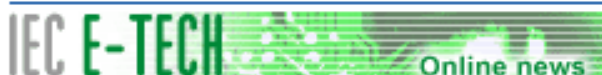
▶ **BP Solar is first solar module manufacturer to receive international product conformity certificate**



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- [Ormazabal penetrates international markets with IEC standards](#)
- [The world of electricity: 1820-1904](#)

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for standards creation work



for IEC experts

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Documents for the committees you need.

TC/SC dashboard:

Find contact information, publications, projects, working documents and figures for any of the

- ▶ [Technical Committees & Subcommittees](#)

Standards in database format



Standards in database format

▶ IEV Online

International Electrotechnical Vocabulary

20 000 electrotechnical terms in English, French, German and Spanish from IEC 60050.

▶ IEC Glossary

10 000 electrotechnical terms in English and French extracted from IEC publications

▶ IEC 60617

Graphical Symbols for Diagrams

1 400 graphical symbols in GIF format

▶ IEC 60417 - ISO 7000

Graphical Symbols for Use on Equipment

3 500 graphical symbols in GIF and PDF format

▶ IEC 61360

Component Data Dictionary

440 classes and 1 400 characteristic properties for electric/electronic components and materials

**SC3D Manages
IEC dictionary
Standard**



Covers:

Definitions

**Product
Declaration
Levels**

**Submitted by
TC3 as new
Work Item**

	DIN 19220 (Translation Into English)	DIN
<p data-bbox="915 161 1169 179">ICS 13.020.30; 29.020; 31.020</p> <p data-bbox="915 339 1601 391">Procedure for the declaration of materials in products of the electrotechnical and electronics industry</p> <p data-bbox="1700 1253 1772 1272">10 pages</p> <p data-bbox="972 1319 1715 1338">DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik im DIN und VDE</p>		



3/707/CDV

COMMITTEE DRAFT FOR VOTE (CDV)
PROJET DE COMITÉ POUR VOTE (CDV)

Project number Numéro de projet		61906/Ed.1
IEC/TC or SC: TC 3 CEI/CE ou SC:	Date of circulation Date de diffusion 2004-01-16	Closing date for voting (Voting mandatory for P-members) Date de clôture du vote (Vote obligatoire pour les membres (P)) 2004-06-18
TC/SC Title: Information structures, documentation and graphical symbols		
Secretary: Mr. Per-Åke SVENSSON Secrétaire:		
Also of interest to the following committees Intéresse également les comités suivants		Supersedes document Remplace le document
Functions concerned Fonctions concernées		
<input type="checkbox"/> Safety Sécurité	<input type="checkbox"/> EMC CEM	<input type="checkbox"/> Environment Environnement
		<input type="checkbox"/> Quality assurance Assurance qualité

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This document is circulated as a CDV according to the FAST TRACK PROCEDURE.

Title : IEC 61906: Procedure for declaration of materials in products of the electrotechnical and electronics industry (DIN 19220)

Introductory note

TC 3 officers have discussed the document and if it is appropriate to handle this document on material declarations in TC3.

TC93 Goals and Mission

Standardization to enable the integration and automation of electrotechnical product design, engineering, manufacturing, and logistics support processes, and to facilitate procedures for product operation and maintenance. This standardization should also support the integrated system design of electrotechnical products which encompasses the electrical, electronic, electromechanical and embedded software performance aspects.

Such standardization involves computer-sensible representations of electrotechnical hardware and embedded and control software for use in computer-aided and auxiliary activities that may directly impact these processes.

This work shall be carried out in collaboration with ISO/TC184 /SC 4 and other relevant technical committees in IEC and ISO.



TC93 Goals and Mission (Cont.)

Representative activities include but are not limited to:

- preparing data element descriptions of electrotechnical products,
- preparing information models or such products,
- preparing design, engineering, manufacturing and logistics support process application protocols,
- identifying hardware and software requirements to support the use and validation of the application protocols,
- developing methods and enabling technologies for TC 93 and other IEC Technical Committees.



TC93 Working Groups

- **TC 93/WG 1: Electronical data harmonization (Approaches, methodologies and technologies)**
- **TC 93/WG 2: Component, circuit and system description languages**
- **TC 93/WG 3: Product Data Exchange (PDX) characteristics and methodology**
- **TC 93/WG 5: Test, validation, conformance and qualification technologies**
- **TC 93/WG 6: Library of Reusable Parts for Electrotechnical Products**
- **TC 93/WG 7: Testing of Electrotechnical Products**
- **TC 93/JWG 11: Product description standard for printed board, printed board assembly, and testing in XML schema**

Context of Verilog/VHDL

Interoperability

- Verilog is widely used.
- Verilog is in the future growth plans of all EDA companies, as well as Semiconductor companies.
- VHDL is a successful standard with stable impact on EDA, and it is used more in conjunction with Verilog than on its own.
- Verilog/VHDL interoperability is usable and is as good as it is ever going to be, as supported by information from Mentor Graphics, ASC Inc., and various standards.



Standards for Verilog/VHDL *Interoperability*

- Similar synthesizable subsets:
 - IEEE Std 1076.6-1999
 - IEEE Std 1364.1-2002
- Same SDF annotation files:
 - IEEE Std 1497-2001



Foreseeable Verilog interoperability issues

- Verification languages:
 - E-language - IEEE P1647
 - PSL - Accellera
- Formal specification:
 - B-language - Oxford University
- C-based languages:
 - C/C++ - ANSI
 - SystemC - Open SystemC Initiative
 - SpecC - UC Irvine

Highlights of IEC/IEEE Dual Logo Agreement

- Approved IEEE Standards are eligible for submission
- Documents Submitted to the IEC Standardization Management Board (SMB) for consideration
- Current plan is to have the appropriate IEC TC review document. No revisions can be made.
- Both organizations agree on the designation
- Process is estimated to take about six months
- IEC national members will have the same rights regarding adoptions as with other IEC standards



Identifying Dual Logo Candidates

- Candidates may be suggested by an IEEE Sponsor Chair, IEEE Working Group Chair, or by the IEC Technical Committee or the IEC Central Office.
- IEEE Staff reviews the Technical, Political and Financial Aspects of the submission
- Appropriate Parties are contacted
 - IEEE Working Group Chair
 - IEEE Sponsor Chair
 - US TAG (if one exists)
 - Chair/Secretary of relevant IEC TC



Submitting Dual Logo Candidates to the IEC

- Candidate is formally submitted to the IEC Central Office
 - IEC reviews candidate
- IEC Central Office sends a Question of Principle (QP) ballot to the SMB
 - Should this document move forward as an IEC/IEEE dual logo document?
- If the ballot passes, the document is sent to the appropriate IEC TC for “fast-tracking”



Sample IEC/IEEE Dual Logo Document

Sample Front Cover

NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC
6XXXX
Première édition
First edition
20XX-XX

IEEE XXXX

Titre –

Partie x:

Titre –

Part x:



Numéro de référence
Reference number
CEI/IEC 6XXXX:20XX
IEEE Std. XXXX:20XX

4 / 6

188AC



Sample First Inside Page

NORME
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IEEE XXXX

Titre –

Partie x:

Titre –

Part x:

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International Electrotechnical Commission, 3, rue de Varembe, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 918 02 11 Telex: +41 22 918 03 00 E-mail: incoma@iec.ch Web: www.iec.ch

The Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, Piscataway, NJ 08855-1331 USA
Telephone: +1 732 962 3800 Telex: +1 732 962 1571 E-mail: info@ieee.org Web: www.standards.ieee.org



5 / 6

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TC 93/WG 3: Product Data Exchange (PDX) characteristics and methodology

To develop IEC Standards based on an XML encoding scheme that enables a total product definition to be described at a level appropriate to facilitate supply chain interactions. These standards are designed to transfer technical information including bill of materials (BOM), approved manufacturer list (AML), as-built product configuration, and change (Engineering, Manufacturing, Product) information.



ZVEI Component Standard

Umbrella Specification
Product Content Sheet and Package Weight List

Electronic Components Division
within the German Electrical and Electronic Manufacturers' Association (ZVEI)



Aluminium Electrolytic Capacitor

Product Family Name	Radial	Panasonic ECEA**KA / ECEA**KS(KK) / ECA**M / EEA(EEU)GA / EEUFC / EEUFK / ECA**HG / EEUEB / EEUED / EEUTA
Date	03.01.2003	
Version	01	

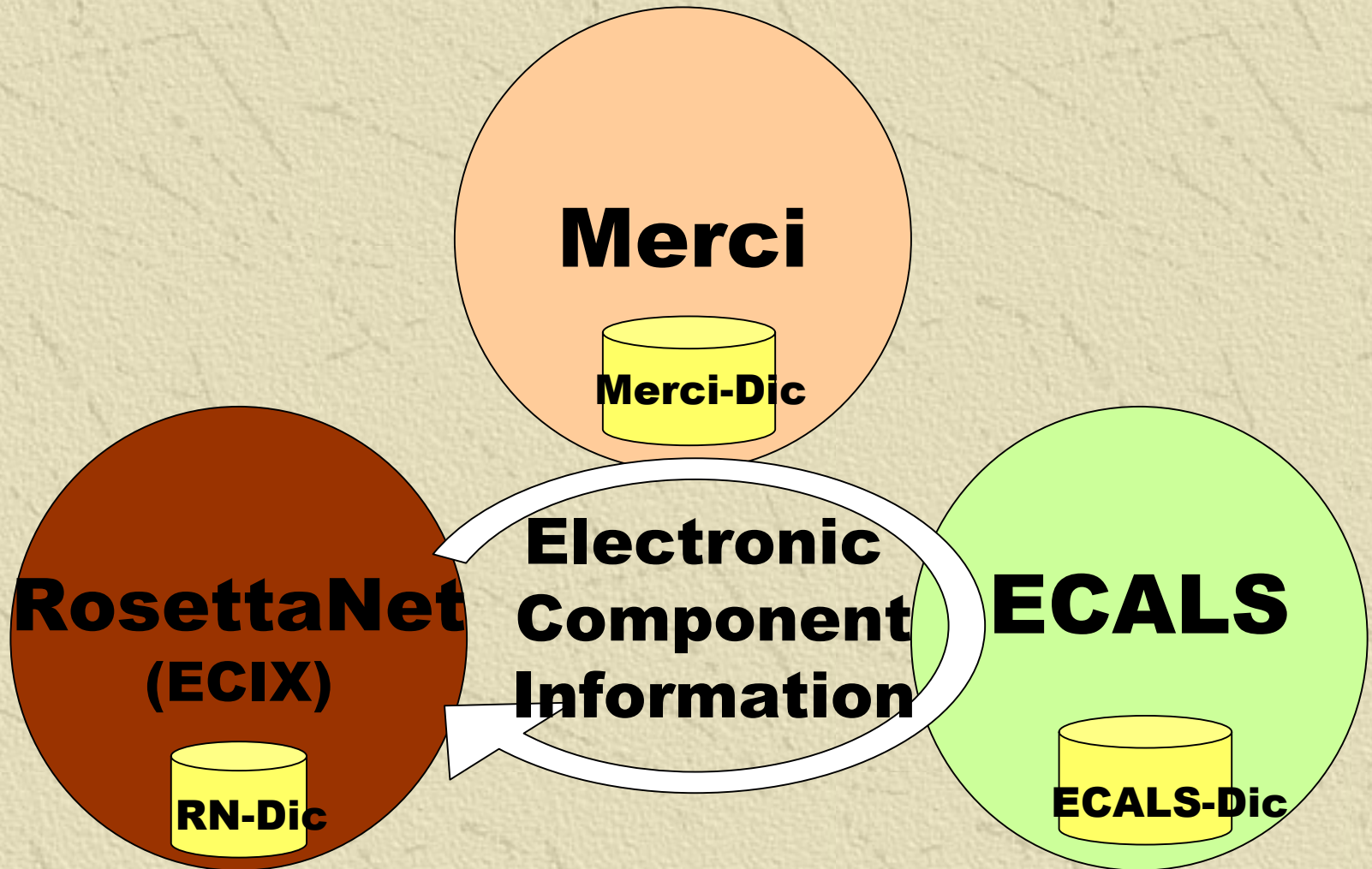
Construction Element	Material group	Materials	CAS if applicable	min	typical mass [wt-%]	max	Sum [%]	Traces	
Active Part	Metals	Al (foil)	7429-90-5	8,1	25,8	36,3	50,1		
	Liquids	Ethylene Glycol Gamma Butyrolacton	25322-68-3 96-48-0	0,8	17,2	29,2			
	Other Materials	Paper		2,6	7,1	12,6			
Encapsulation (Cover Disk)	Metals	Al (case)	7429-90-5	14,1	21,0	29,8	40,2		
	Other Materials	Rubber		8,8	15,1	29,3			
	Plastics	PVC / PET		2,2	4,1	7,5			
		(Including about 0,04 - 0,15 % per part weight lead compound as additives in PVC)							
Termination	Metals	Fe (Sn coated) wires	7439-89-6	1,4	9,7	45,1	9,7		
Sum in total:							100		

TC 93/WG 6: Library of Reusable Parts for Electrotechnical Products

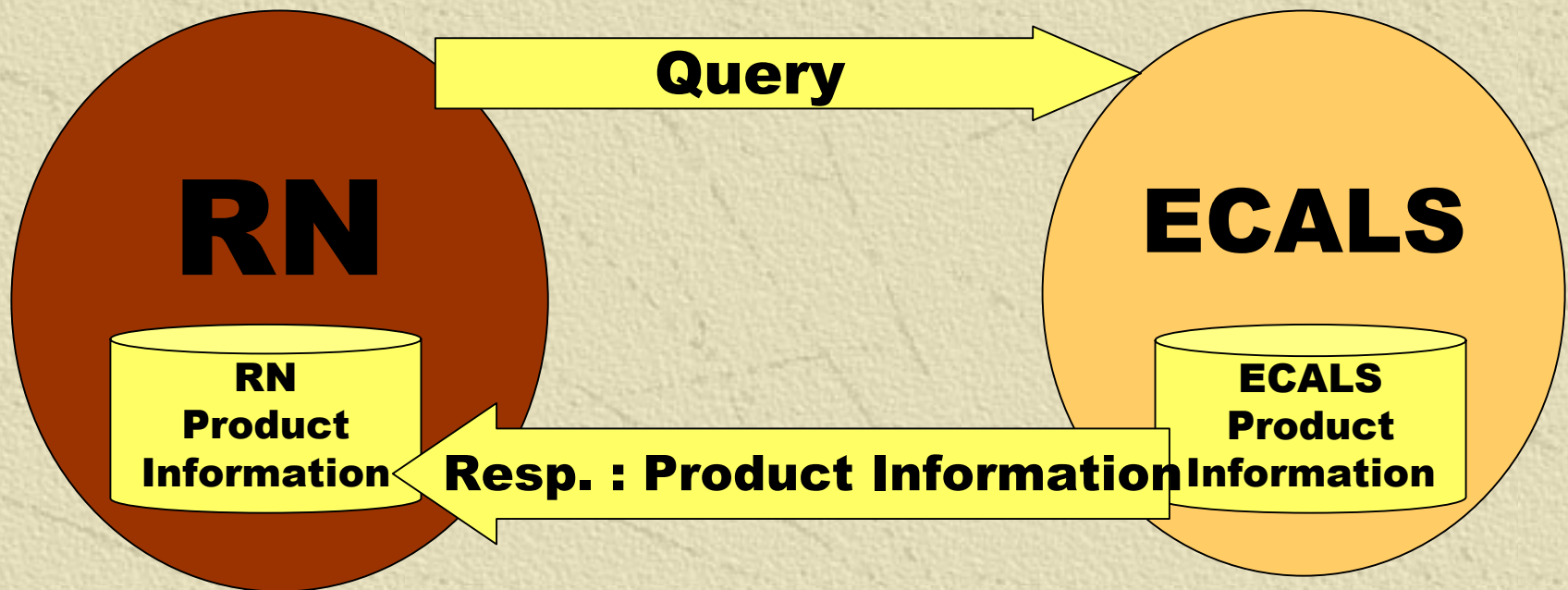
To prepare standards in the area of component libraries. This consists of a test plan that develops interoperability characteristics between 3 major libraries promoted by IEC, RosettaNet, and ECALS. A technical report will determine interoperability establishing detailed queries and responses between the 3 dictionaries. It is anticipated that the Open Interoperability Data Dictionary Initiative (OIDDI) will address many of these issues and TC93 will participate where appropriate to determine library reusable part descriptions.



Information Exchange Experiment



RN and ECALS can exchange their EC information.



Test Plan

Developed in
March

Updated in
August



IEC Test Program

**INTERNATIONAL ELECTROTECHNICAL COMMISSION
TECHNICAL COMMITTEE No. 93: DESIGN AUTOMATION**

**Electronic Component Description
Interoperability Experiment**

Using
ECALS, ECIX(RosettaNet), MERCI
PLIB, IEC61360 **Methodologies**

Revised Draft Proposal August 2002

New Work Item Proposal

93/164/NP

✚ **The proposal** (to be completed by the proposer)

Title of proposal

Interoperability Testing of Data Element Dictionaries (Plan, Implementation and Analysis Report)

Standard

Technical Specification

Scope (as defined in ISO/IEC Directives, Part 2, 6.2.1)

Development, implementation, and analysis of an interoperability test plan designed to ensure that systems developed around three of the largest available data dictionaries (IEC, ECALS, and RosettaNet) have the ability to query and properly handle electronic component information exchanged between trading partners.

Purpose and justification, including the market relevance and relationship to Safety (Guide 104), EMC (Guide 107), Environmental aspects (Guide 109) and Quality assurance (Guide 102) . (attach a separate page as annex, if necessary)

Electronic component dictionaries are the most essential architecture in forming the basis for shared understanding that makes product information exchanges possible. Presently there are three Dictionaries that describe electronic components being used throughout the global industry. These dictionaries are supported by either IEC standard bodies or groups of consortia formed to address the global needs of their supply chain members. In order to support international commerce of electronic components, it is necessary that systems based on these three dictionaries have the ability to exchange and manage the data without ambiguity. This experiment is designed to highlight the similarities and differences between the dictionaries in order to be able to draft plans for the organizations to achieve harmonization.

Target date

for first CD 2002-12

for IS 2004-08

Estimated number of meetings 4

5

Estimated number of meetings 4

2002

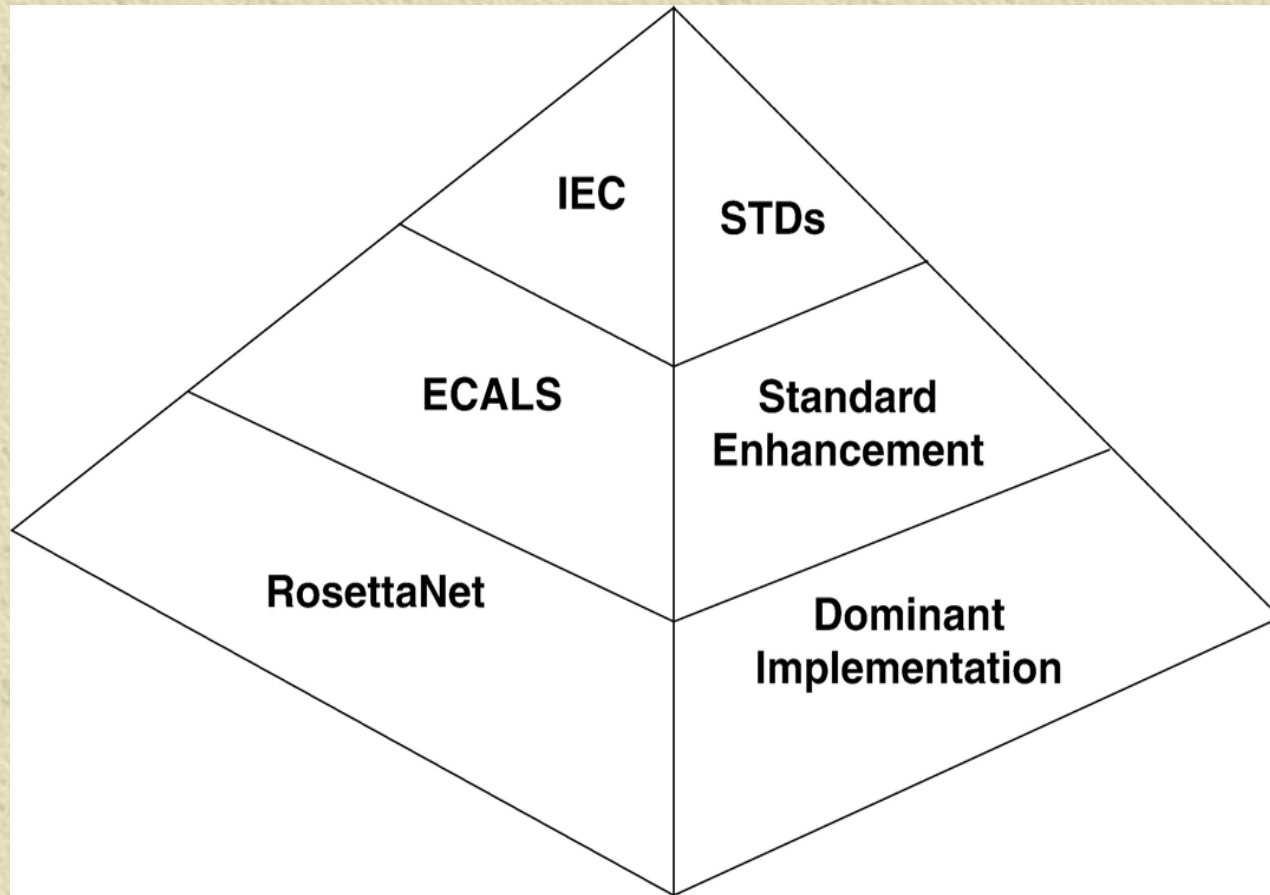
Queries

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	XJA024			RF-FREQUENCY		6,305								RNTD Random Class		
2	XJA065			SWITCHING		3								RNTD Random Class		
3	XJA327		PIEZOELECTRIC			14								RNTD Random Class		
4	XJA337		CYLINDERUNITS			1								RNTD Random Class		
5	XJA384			PRESSURESENSOR		0								MERCI		
6	XJA644		DYNAMICRAMS			4								MERCI		
7	XJA699		PHOTODETECTORS			0								MERCI		
8	XJA705			SMALLSIGNALBIPOL		543								MERCI		
9	XJA706			BIPOLARPOWERTRA		0								MERCI		
10	XJA709			POWERMOSFETS		467								MERCI		
11	XJA713	DIODES												MERCI		
12	XJA718		SHOTKEYBARRIERDIODES			0								MERCI		
13	XJA645		STATICRAMS			224								Toshiba		
14	XJA648		ELECTRICALLYEPROMS			49								Toshiba		
15	XJA650		FLASHMEMORIES			8								Toshiba		
16	XJA656		GATEARRAY			0								Toshiba		
17	XJA657		STANDARDCELLS			0								Toshiba		
18	XJA658		EMBEDDEDARRAYS			0								Toshiba		
19	XJA676		CMOS			0								Toshiba		
20	XJA677		BIPOLAR&CMOSCOMBINED			0								Toshiba		
21	XJA681		INTERFACEICS			0								Toshiba		
22	XJA629		MICROCONTROLLERS			2,152								NEC		
23	XJA636		MICROPROCESSORS			35								NEC		
24	XJA667		ASSPFORPOWERSUPPLY			141								NEC		
25	XJA683		OPERATIONALAMPLIFIERS			60								NEC		
26	XJA684		COMPARATORS			8								NEC		
27	XJA705			SMALLSIGNALBIPOL		543								NEC		
28	XJA709			POWERMOSFETS		467								NEC		
29	XJA713	DIODES												NEC		
30	XJA644		DYNAMICRAMS			4								OKI		

On the Positive Side

- ✦ Rosettanet has no desire to be the standard bearer
- ✦ Checking interoperability will make each team member a better industry contributor
- ✦ Like it or not the world moves on where many companies are adopting the commercially available products as well as moving to XML schema descriptions
- ✦ Continuing with the IEC test plan evaluation highlights the problems facing the industry
- ✦ IEC is developing the standards data base for free user access

The Standardization Pyramid



IEC data base for component Elements

- [Electric/electronic Components](#), 46)
 - [\(Amplifiers](#), 4)
 - [\(Low-frequency Amplifiers](#), 0)
 - [\(Power Amplifiers](#), 0)
 - [\(Voltage Amplifiers](#), 7)
 - [\(Differential Amplifiers](#), 4)
 - [\(Operational Amplifiers](#), 7)
 - [\(Ac-coupled Amplifiers](#), 0)
 - [\(Wideband Amplifiers](#), 9)
 - [\(Single-sided Amplifiers](#), 0)
 - [\(Radio Frequency Amplifiers](#), 0)
 - [\(Wideband Amplifiers](#), 9)
 - [\(Antennas](#), 2)
 - [\(Capacitive Antennas](#), 3)
 - [\(Inductive Antennas](#), 3)
 - [\(Resistive Antennas](#), 0)
 - [\(Batteries](#), 5)
 - [\(Primary Batteries](#), 1)
 - [\(Secondary Batteries](#), 4)
 - [\(Capacitors](#), 7)
 - [\(Fixed Capacitors](#), 12)
 - [\(Fixed Air Capacitors](#), 0)
 - [\(Fixed Ceramic Capacitors](#), 0)
 - [\(Fixed Class1 Ceramic Capacitors](#), 2)
 - [\(Fixed Class2 Ceramic Capacitors](#), 2)
 - [\(Fixed Electrolytic Capacitors](#), 8)
 - [\(Fixed Film Capacitors](#), 4)
 - [\(Fixed Glass Capacitors](#), 0)
 - [\(Fixed Mica Capacitors](#), 0)
 - [\(Fixed Paper Capacitors](#), 0)
 - [\(Variable Capacitors](#), 6)
 - [\(Conductors](#), 9)

Fixed Capacitors

- [encapsulation technology](#)
- [circuit application \(cap\)](#)
- [safety class](#)
- [performance grade](#)
- [capacitance lower tolerance %](#)
- [capacitance](#)
- [capacitance upper tolerance %](#)
- [capacitance tolerance](#)
- [capacitance upper tolerance](#)
- [capacitance lower tolerance](#)
- [insulation resistance](#)
- [time constant \(of capacitor\)](#)

Capacitance Tolerance

Term	Value
Extended Name	capacitance tolerance
Definition	The nominal tolerance percentage on capacitance (in %) identifying a capacitor class.
Remark	Used only in cases of equal positive and negative tolerance values.

Preliminary Conclusions

- ✦ Harmonization Required Between Dictionaries.
- ✦ Creating Dictionary Mappings are Not Easy.
 - ◆ New dictionaries are being developed.
 - ◆ Modifications make dictionaries moving targets.
- ✦ Dictionaries Have To Satisfy Their Members
 - ◆ Dictionaries need the ability to add new elements.
- ✦ Characteristics of a good solution:
 - ◆ Willingness of participants to work together
 - ◆ Simplistic as possible
 - ◆ Work is evenly distributed
 - ◆ Each dictionary must be treated equally

Suggested Recommendations

- ✦ Treat every dictionary equally.
- ✦ Allow each dictionary organization to be an expert in its own domain and to satisfy its own customers.
- ✦ Allow development/enhancement of existing dictionaries by leveraging the work of others.
 - ◆ Make each dictionary freely available in electronic format.
 - ◆ Each dictionary maintenance organization should keep a change log detailing changes to the dictionary which is freely available to all interested parties. (Recommend XML Format)
 - ◆ Work to reduce class/name confusion between dictionaries.
 - ◆ Allow each class/element/attribute to be tracked back to its source dictionary.
 - ◆ Avoid duplication where possible.

Suggested Recommendations

- ✦ A core set of attributes for every class should be identified where part suppliers will ensure those values are populated.
 - ◆ The source for the core attributes should be as centrally located as possible (recommended to be the IEC)
 - ◆ TC93 and SC3 could work with industry to establish the core sets of attributes for any set of class submitted.
 - ◆ Must guarantee a fixed turn around time for identification of the core set.
 - ◆ Limit of 10 core characteristics
- ✦ Ensure the use of the Synonyms in the Dictionaries to represent equivalence.



Merci Introduction

- Partially funded by EU
- Partners:
 - Infineon (D), Aerospatiale Matra Missiles (F), Mentor Graphics (D)
 - Rosemann & Lauridsen (D), EPM Technology (N), FernUniversität Hagen (D), ENSMA/LISI (F)
 - Adepa (F)
- Duration: 1/2000 – 4/2002
- Company foundation in March: SEMAINO



Interoperability of important standards

- **Current problem:**
 - Variety of standards and dictionaries
 - International
 - ✓ RosettaNet, IEC61360, ECALS
 - ✓ UN/SPSC, ebXML, ...
 - European
 - ✓ BMEcat, eCl@ss
- **Vision:**
 - Interoperability between standards
 - ✓ Supported by tools
 - Harmonisation of standards
 - Mapping between dictionaries



Basis of MERCI: PLIB

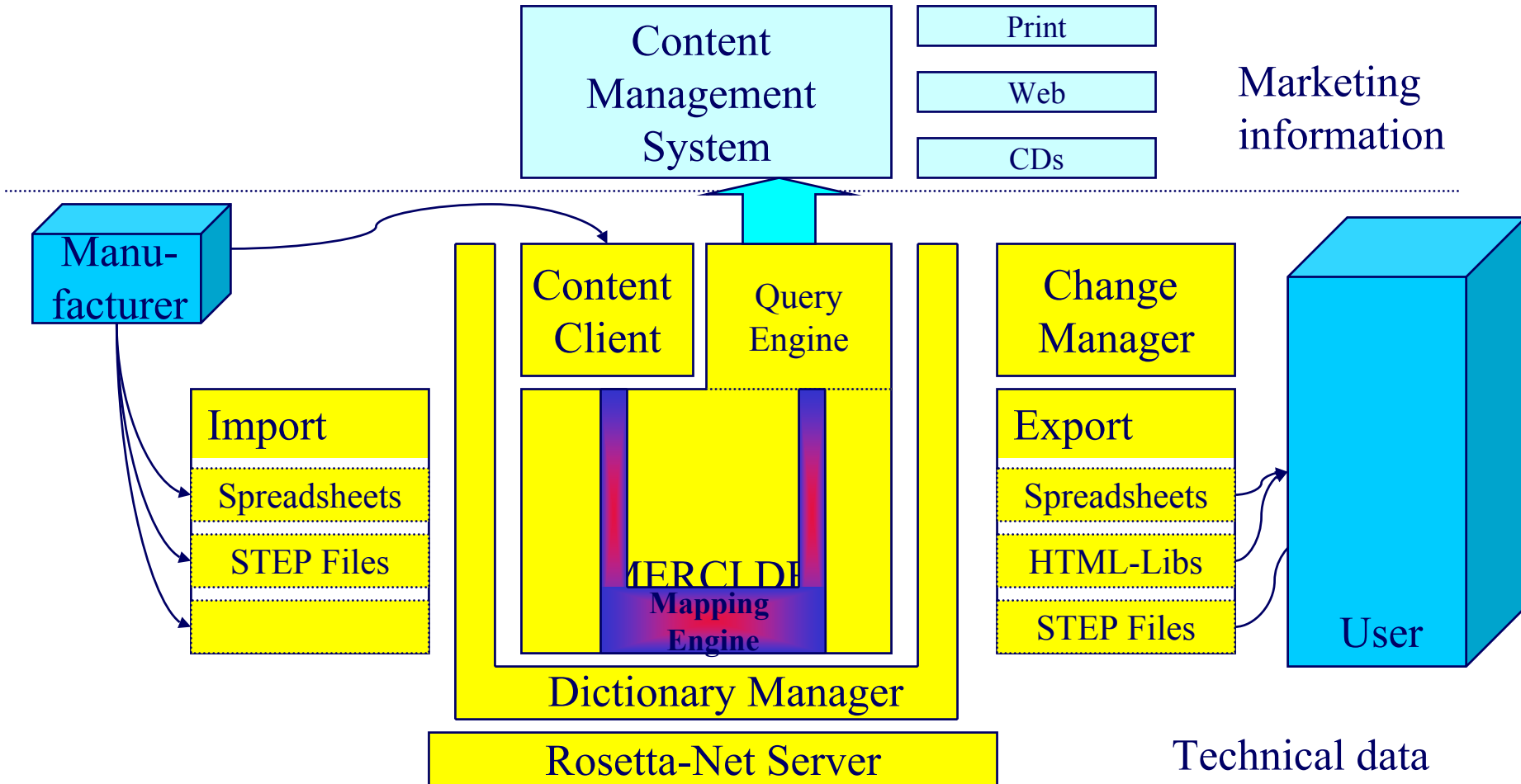
- PLIB: Standard for the exchange of product library data (ISO 15384)

- Basic concepts of PLIB:
 - Definition of a dictionary
 - Relationship between all component data elements to the dictionary

- Defined by an EXPRESS information model



Overview MERCI System

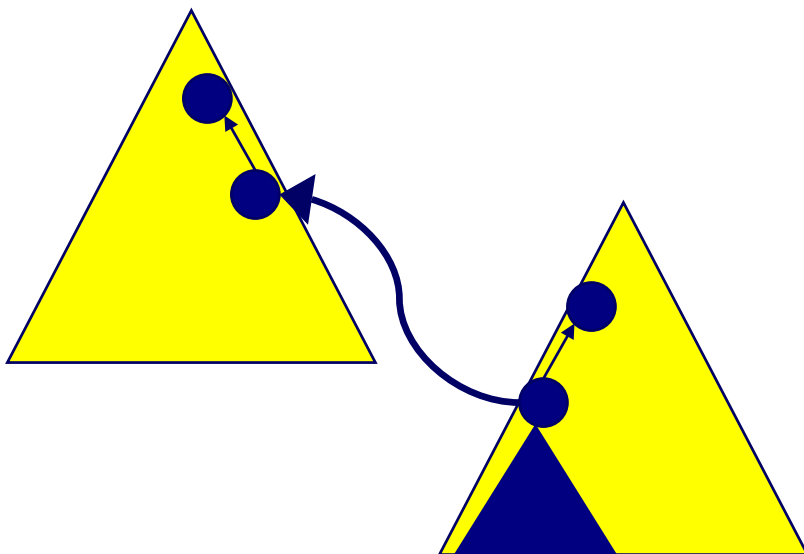


- Dictionaries are used in MERCI
 - For the description of data semantics
 - For data retrieval
 - For integration and organisation of component information of different manufacturers

Relationships between Dictionaries

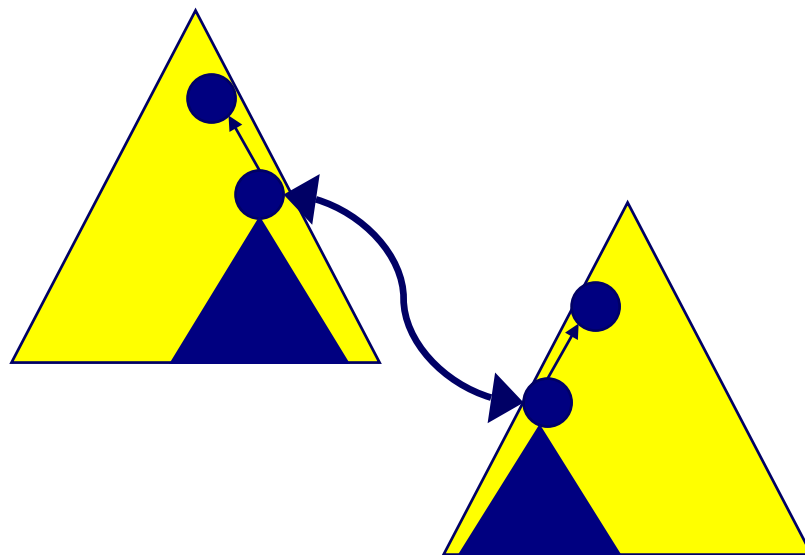
Case-of relationship:

Dictionary A „borrows“ properties from dictionary B



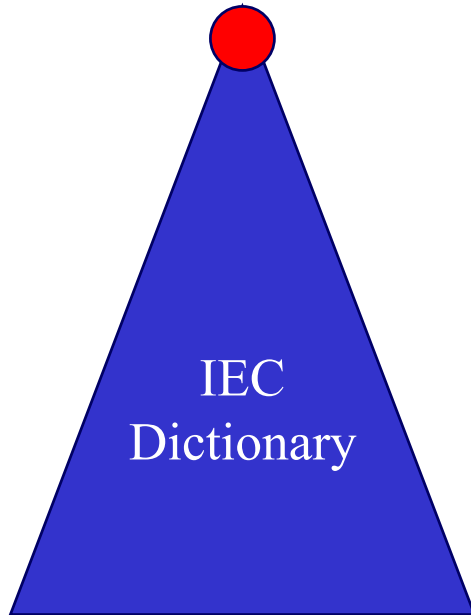
Mapping:

Elements from dictionary A correspond to elements from dictionary B



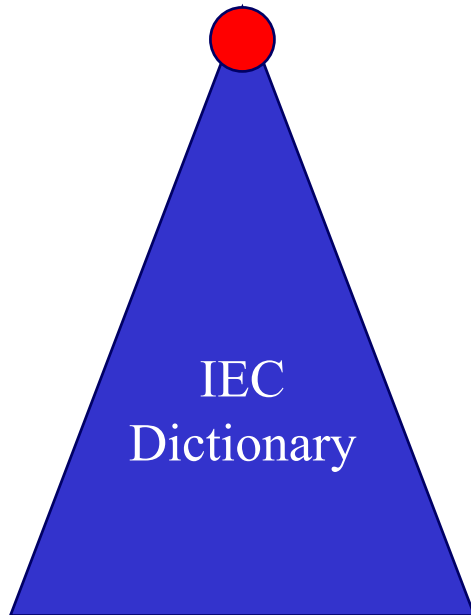


Dictionary Organisation in MERC



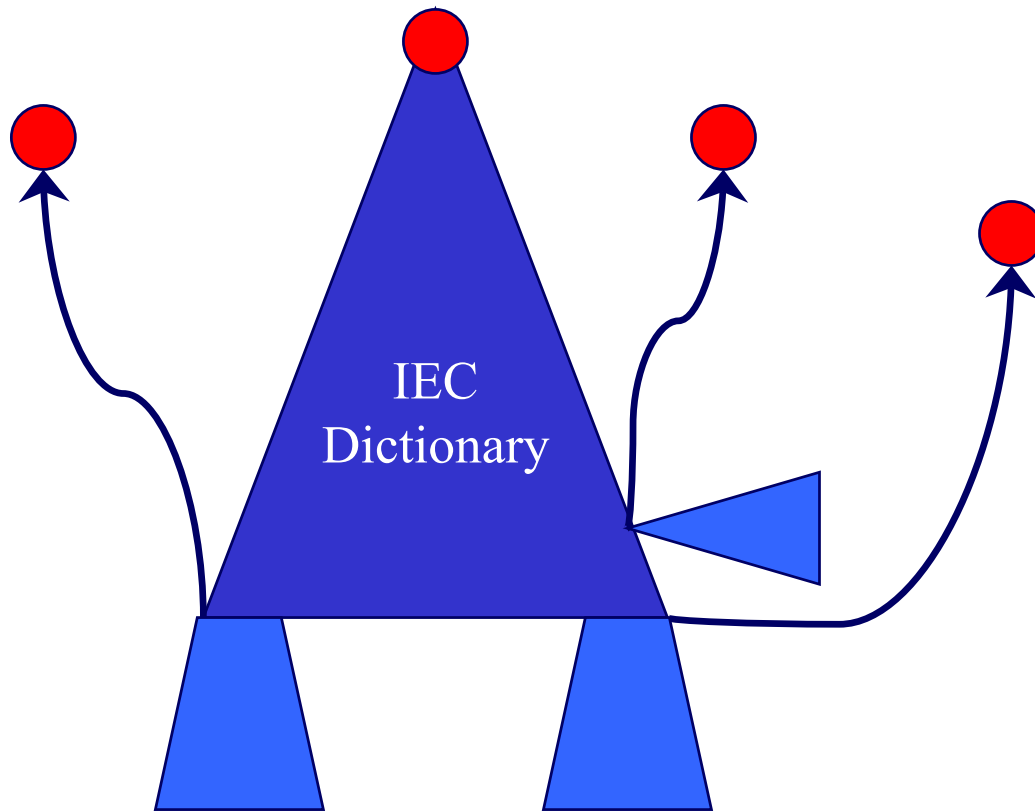
- Kernel: reference dictionary

Dictionary Organisation in MERC



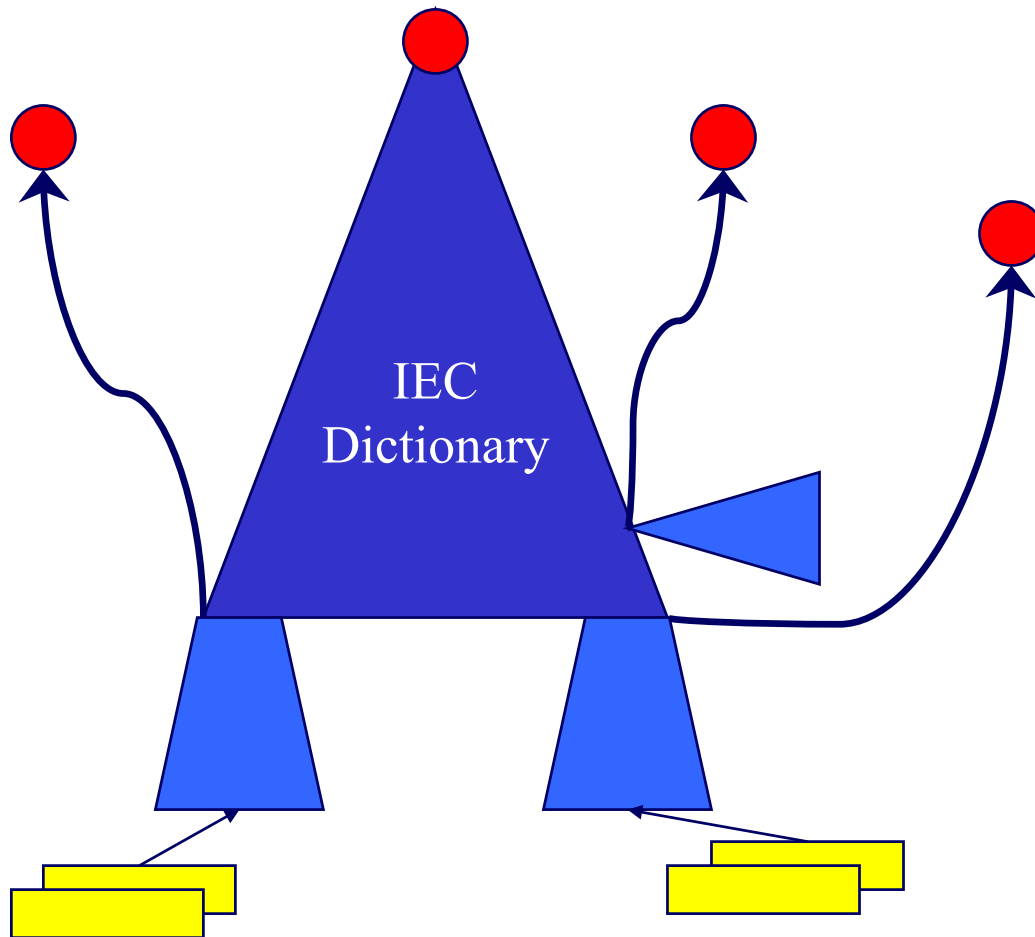
- Kernel: reference dictionary
- Manufacturers provide their own dictionaries...

Dictionary Organisation in MERC



- Kernel: reference dictionary
- Manufacturers provide their own dictionaries...
- ... as extension of the kernel dictionary

Dictionary Organisation in MERC



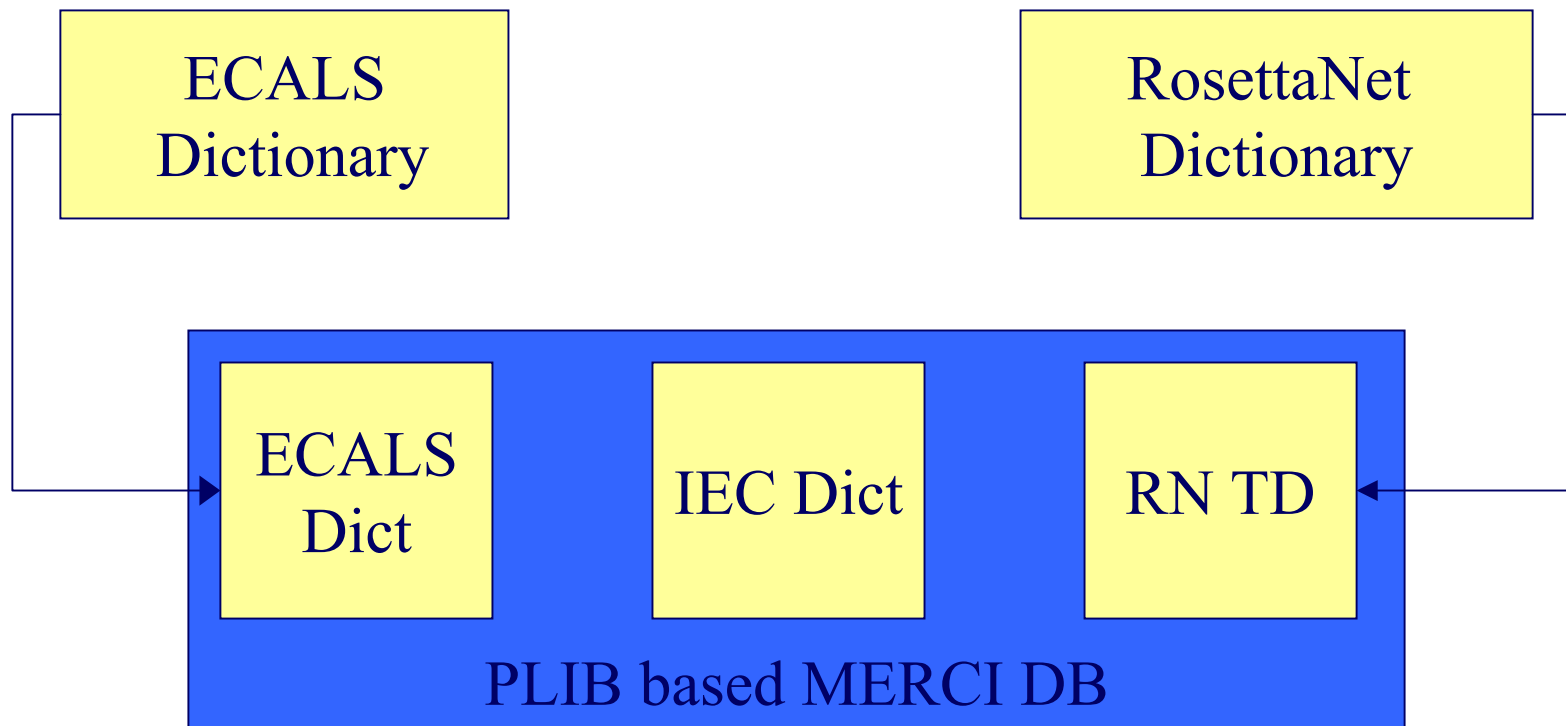
- Kernel: reference dictionary
- Manufacturers provide their own dictionaries...
- ... as extension of the kernel dictionary
- Component information is organised in the manufacturer dictionaries



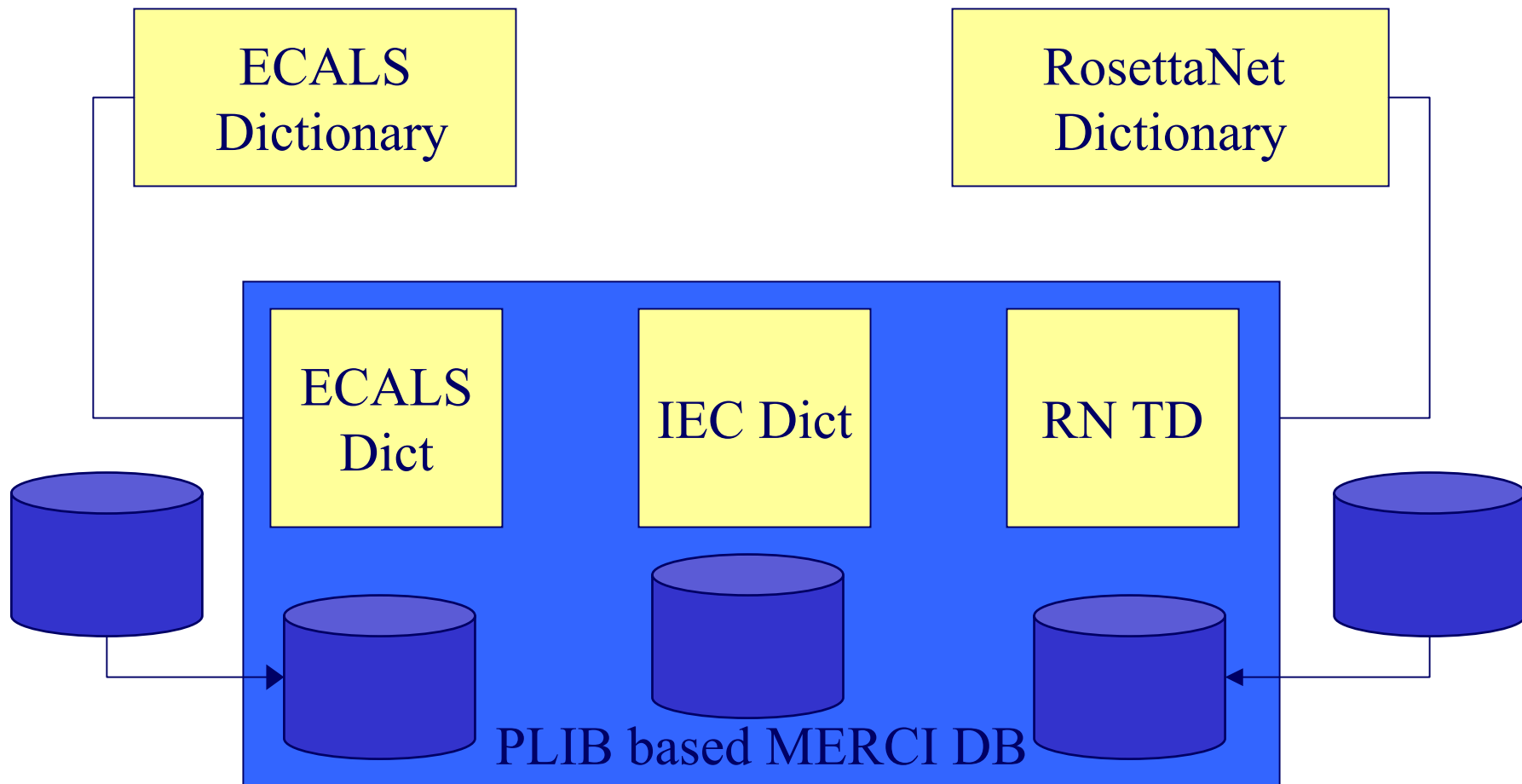
Dictionary Organisation in MERCI (2)

- Different dictionaries in one database
- Dictionaries are interrelated (via the core reference dictionary)
- ➔ Search and download can be performed
 - manufacturer specific
 - general

Step 1: Structural Mapping

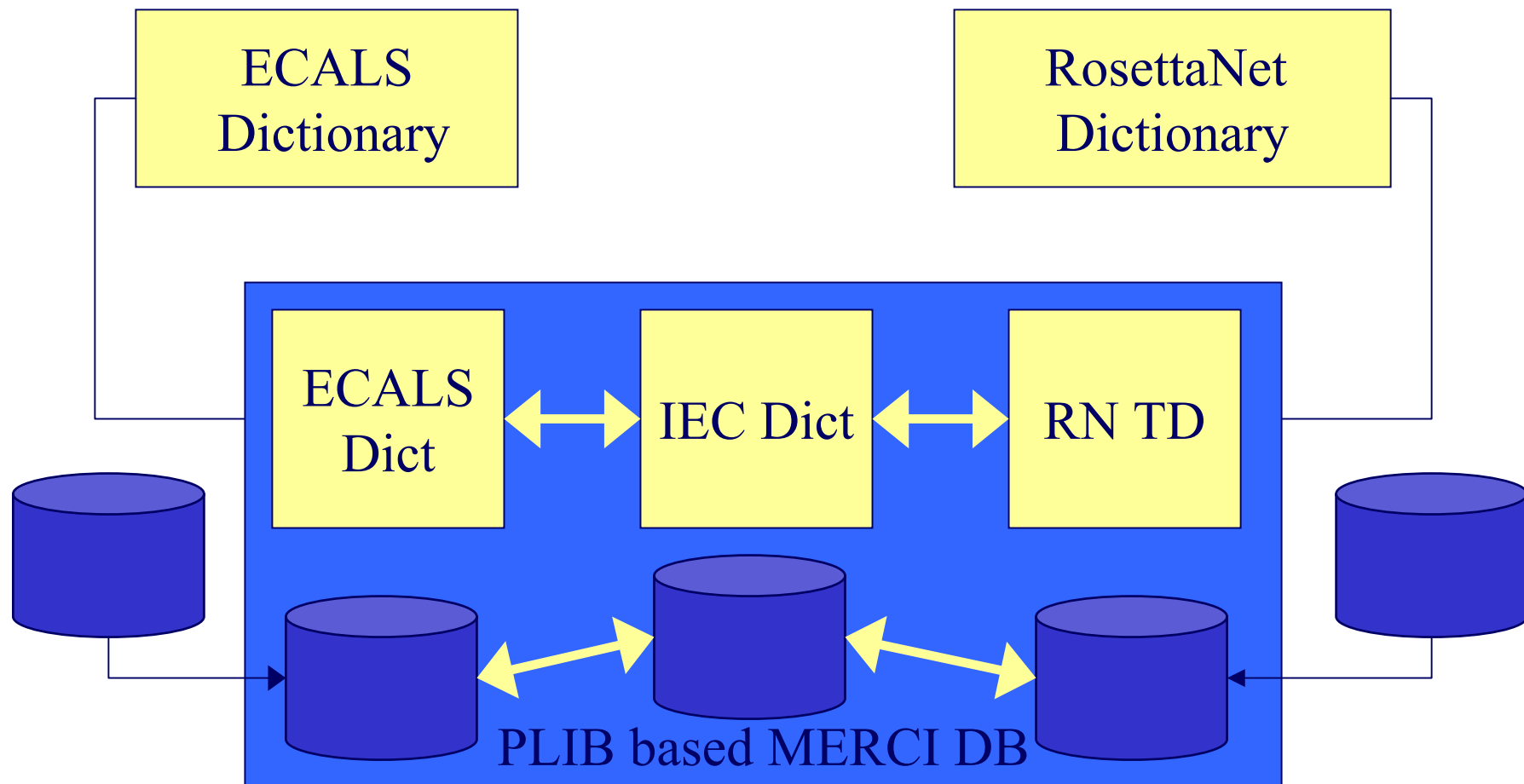


Step 1: Structural Mapping



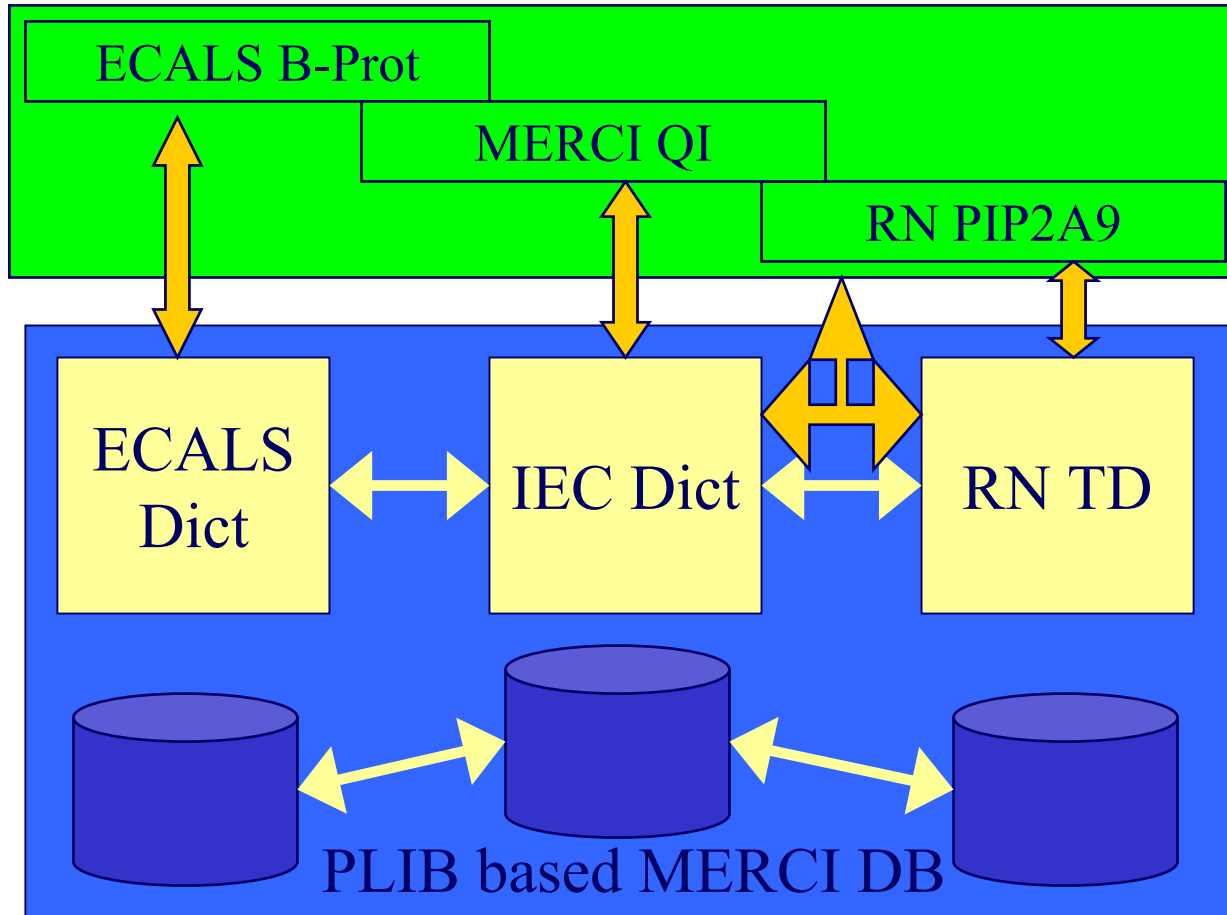
- Comparison of structures for dictionary definition
 - Which elements are identical
 - Which elements are mappable
 - ✓ What is the potential information loss
 - Which elements are not transferable
- Comparison of structures for component representations
- Basic focus: Information models

Step 2: Content Mapping

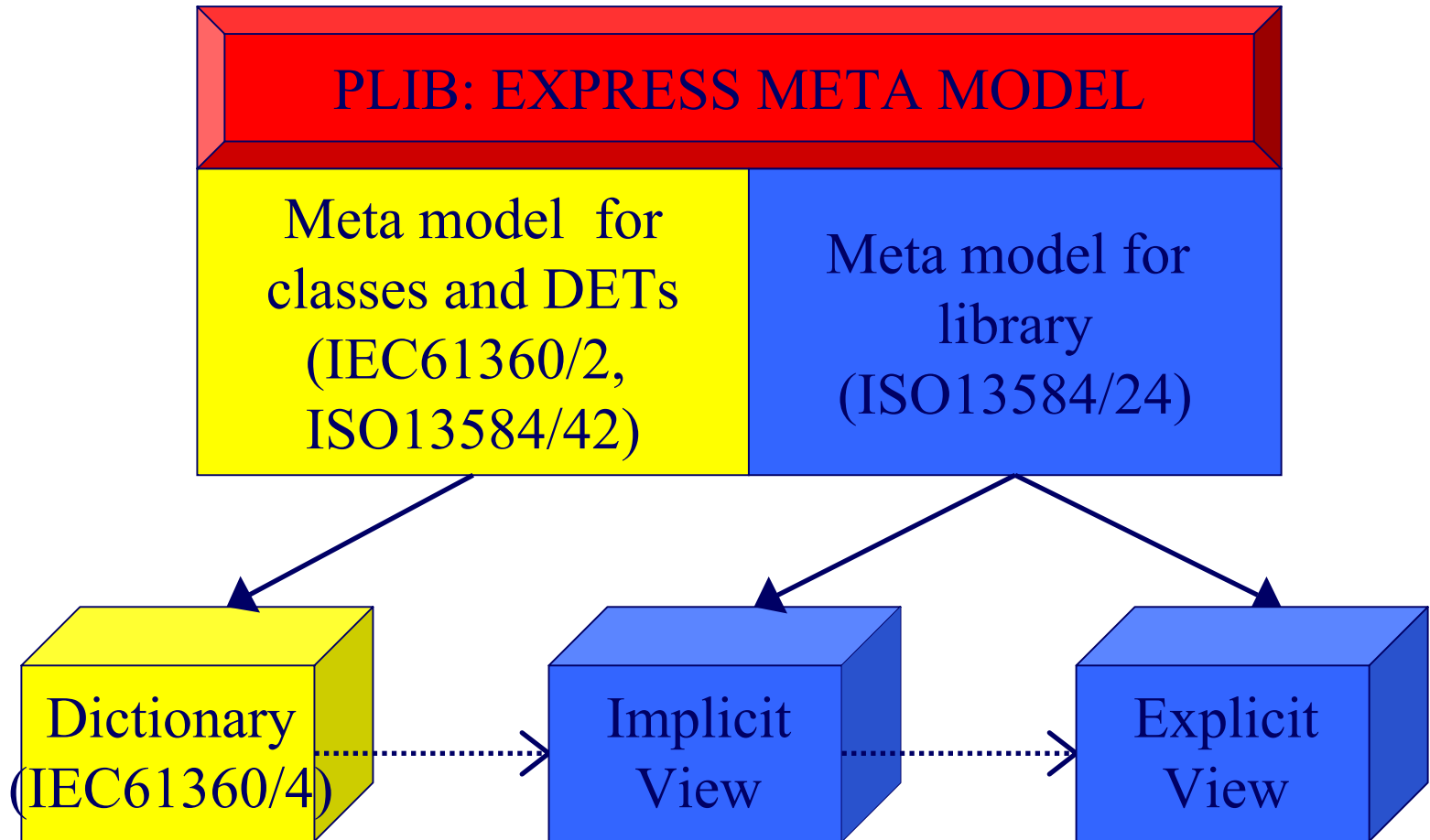


- Comparison of dictionaries
 - Class hierarchies
 - Classes and their corresponding classes
 - ✓ Exactly the same coverage?
 - ✓ Potential information loss?
 - Property definitions
 - ✓ Corresponding properties?
 - ✓ Same meaning?
 - ✓ Same definition (data type, etc.)?
 - ✓ Loss of information?

Step 3: Inclusion of business protocols



IEC61360/P-Lib data model





OIDD

Open and interoperable domain dictionaries initiative

"From overlapping competing and proprietary domain dictionaries to open, extensible and compatible ones"

The goal of this initiative is :

*to promote the emergence of **compatible and complementary dictionaries** that would progressively cover the whole technical and business domain, and to ensure **orthogonality** between domain **dictionaries** and business **processes**: any dictionary should be usable for any business process.*

Will consider Material Declaration Issues?