



The CIDOC CRM

CIDOC-CRM Method: A Standardisation View

Haridimos Kondylakis, Martin Doerr, Dimitris Plexousakis,

***Center for Cultural Informatics,
Institute of Computer Science
Foundation for Research and Technology – Hellas
&
Computer Science Department, University of Crete***

Vienna, September 8, 2011



1. CIDOC-CRM
2. CIDOC-CRM as a Modelling Method
 1. Semantics
 2. Syntax
 3. Notation
3. CIDOC-CRM contributing to OMI through plugIT



The CIDOC CRM:

Reasoning on Cultural Heritage

Cultural information is more than “a domain”:

- Collection description (art, crafts, scholarship, archeology, natural history....)
- Archives and literature (records, treaties, letters, artful works..)
- Administration, preservation, **conservation of material heritage**
- Science and scholarship – **investigation, interpretation**
- Presentation – exhibition making, teaching, publication

*But facts, relationships and hypotheses **span** the whole universe of cultural discourse.
So, how to make a “global model”?*

- Data overlap, but do **not fit into one** schema – every discipline employs and **needs different** data structures
- Understanding lives from relationships.
- What are the **relevant relationships** capable to **connect** the meaning expressed in our documents?



The CIDOC CRM:

Historical Archives...

Type: Text
Title: Protocol of Proceedings of Crimea Conference
Title.Subtitle: II. Declaration of Liberated Europe
Date: February 11, 1945
Creator: The Premier of the Union of Soviet Socialist Republics
The Prime Minister of the United Kingdom
The President of the United States of America
Publisher: State Department
Subject: Postwar division of Europe and Japan

Metadata

Documents



“The following declaration has been approved:
The Premier of the Union of Soviet Socialist Republics,
the Prime Minister of the United Kingdom and the President
of the United States of America have consulted with each
other in the common interests of the people of their countries
and those of liberated Europe. They jointly declare their mutual
agreement to concert...
....and to ensure that Germany will never again be able to
disturb the peace of the world..... “



The CIDOC CRM:

Images, non-verbose...

Type: Image
Title: Allied Leaders at Yalta
Date: 1945
Publisher: United Press International (UPI)
Source: The Bettmann Archive
Copyright: Corbis
References: Churchill, Roosevelt, Stalin

Metadata



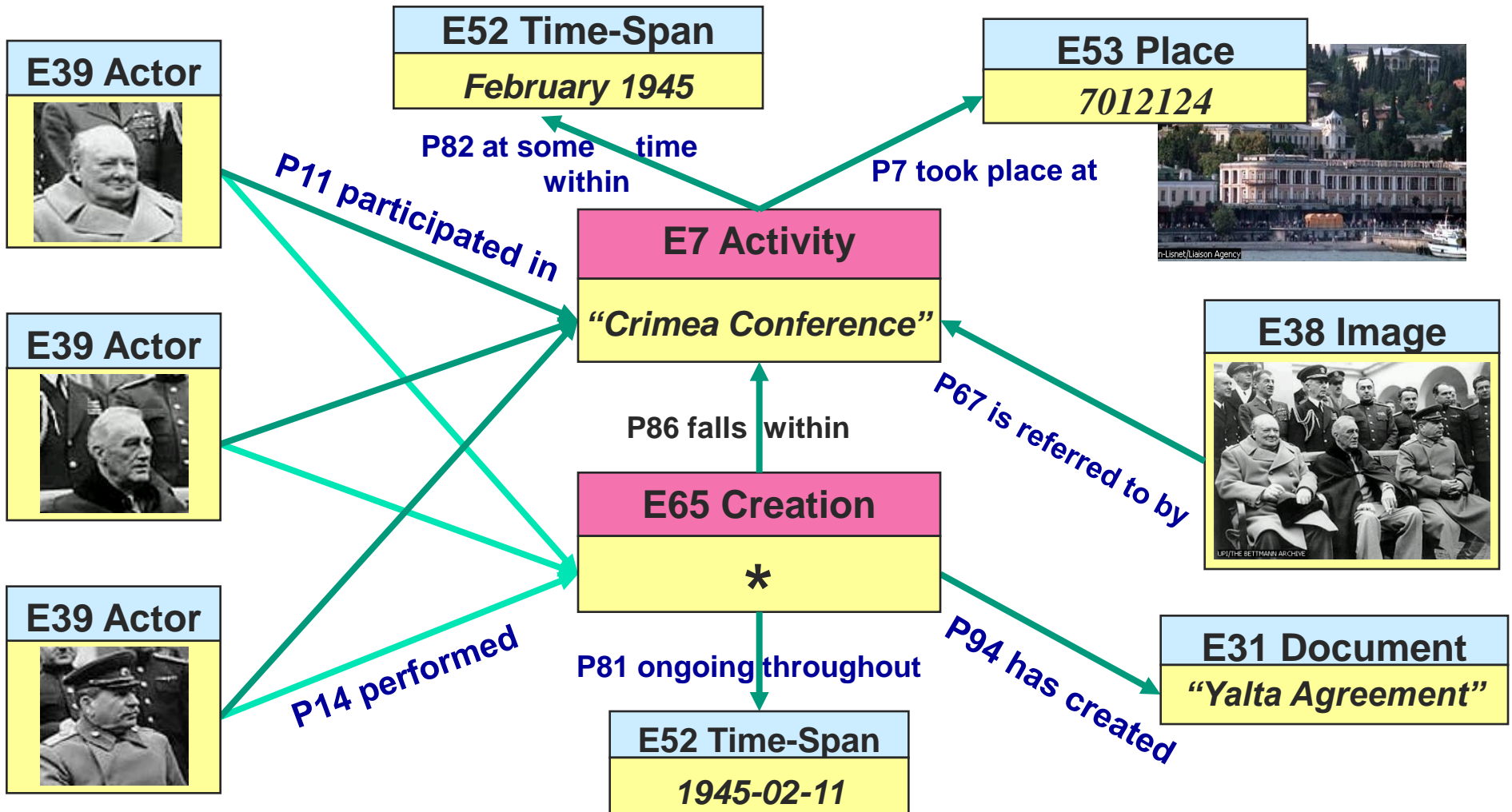
Photos, Persons





The CIDOC CRM:

Explicit Events, Item Identity, Symmetry





The CIDOC CRM:

Roles of the CIDOC CRM

The CIDOC CRM (ISO21127:2006)....

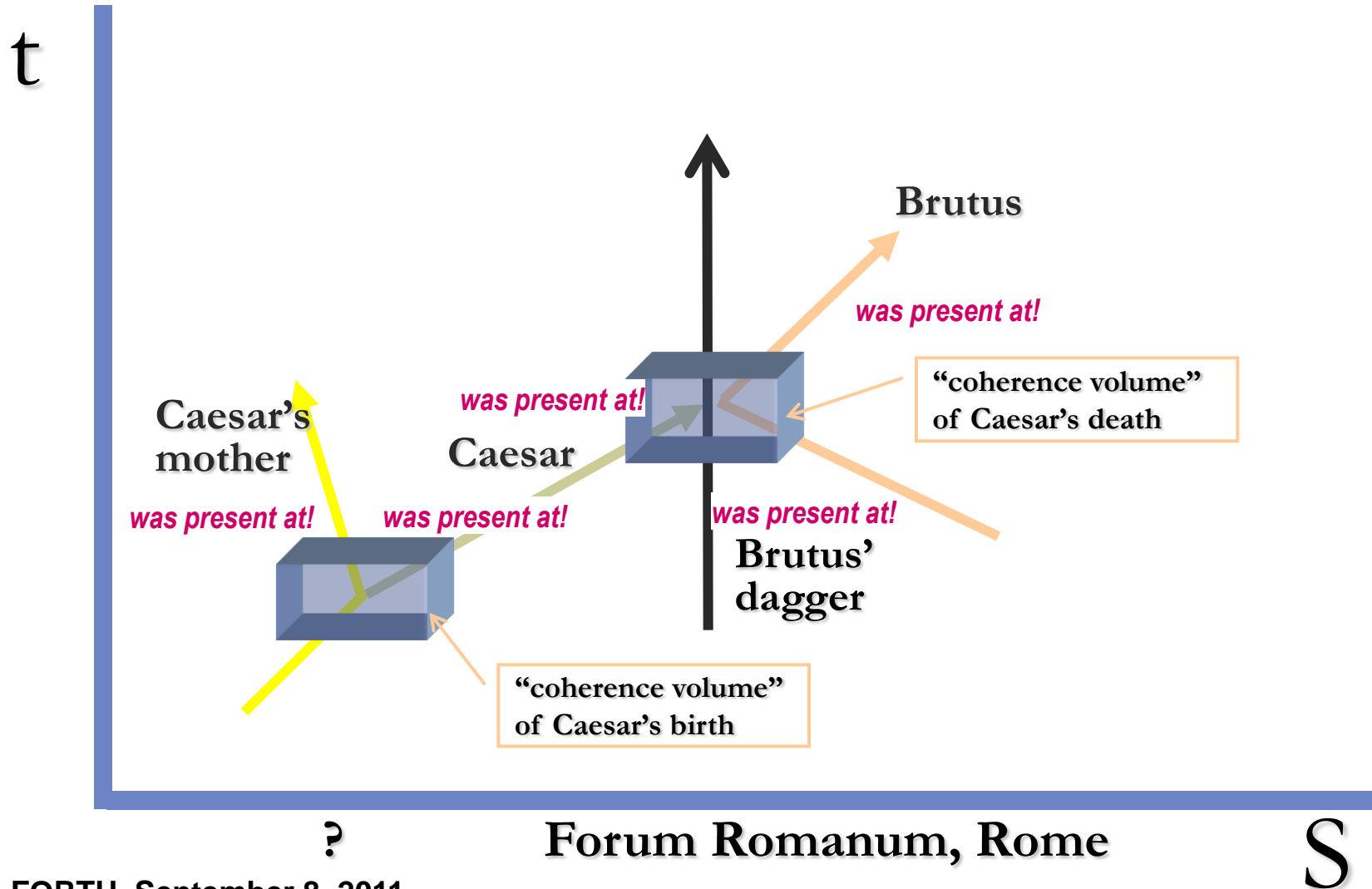
- ...**captures** the underlying semantics of relevant documentation structures in a **formal ontology**
- **Ontologies** are **formalized knowledge (TEXTS!)**: clearly defined concepts and relationships about **possible states of affairs** in a domain
- **Ontologies** can be **approximated** by **DATA STRUCTURES** (RDF!...) to enable data exchange, data integration, **access, query** mediation etc.
- **Data structures** can be interpreted and transformed into sets of atomic statements by ontologies – **intellectually** or in **RDF encoding**.
- **Good ontologies** can be extended without reducing interoperability. “**Extensible** ontologies of **relationships**” provide **shared explanations** rather than **restriction** to a common data structure, to **answer research** questions.

=> Radical abstraction of a wide range of specialized databases to the basic relationships and open sets of terminologies (which appear as data).



The CIDOC CRM:

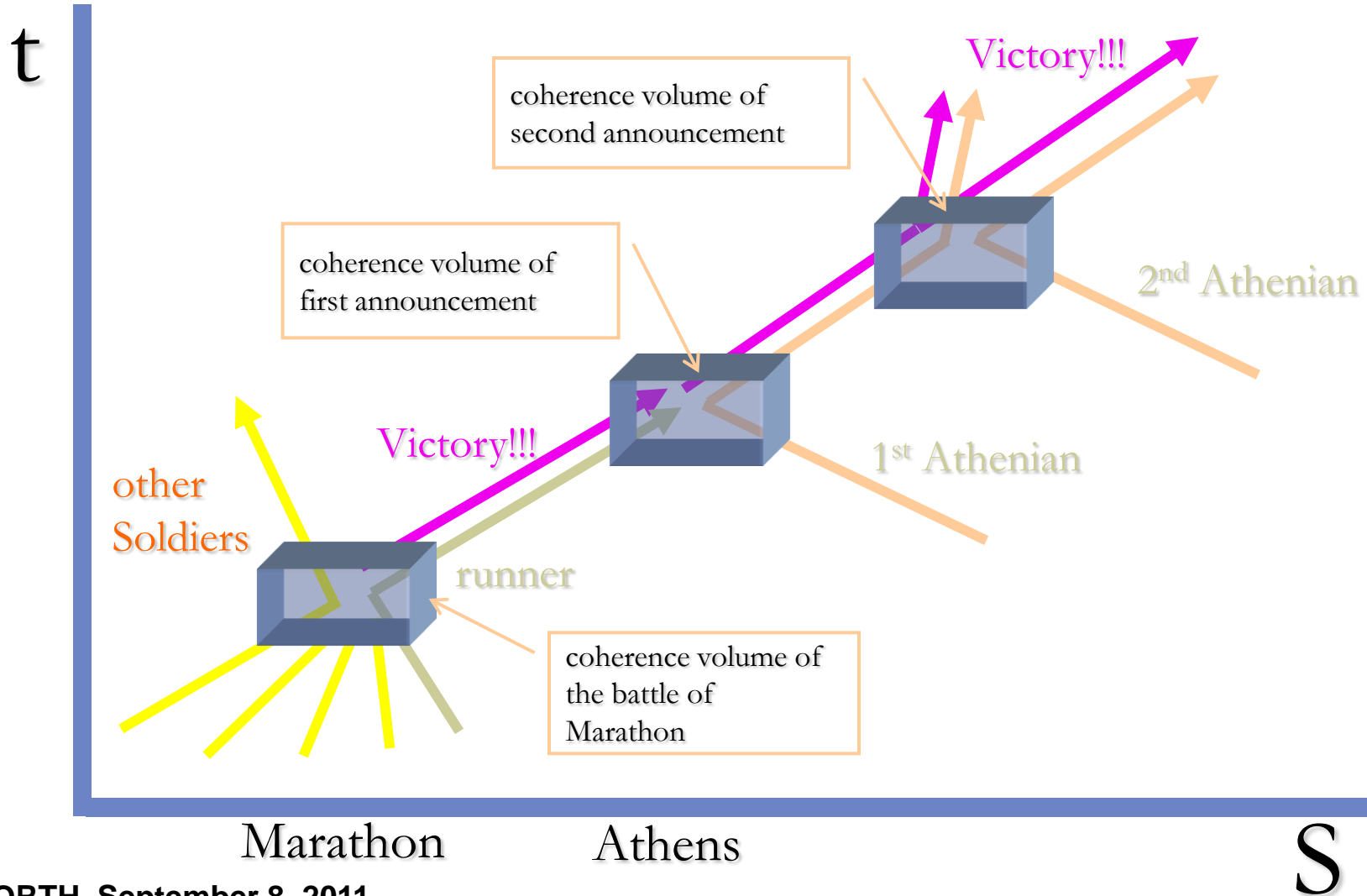
Historical Events as Meetings





The CIDOC CRM:

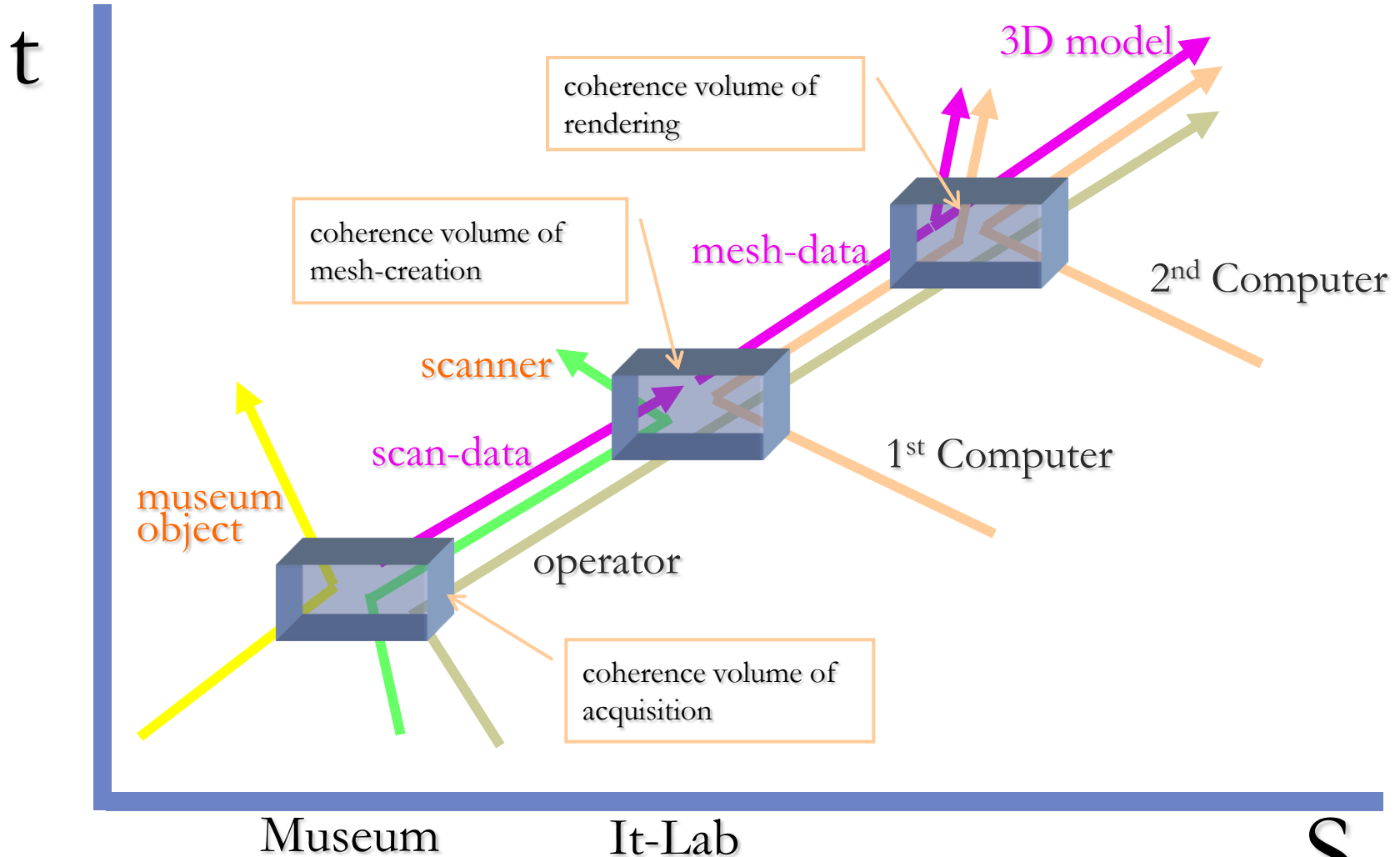
Exchanges of information as meetings





The CIDOC CRM:

3D Model Creation as Meetings





The CIDOC CRM:

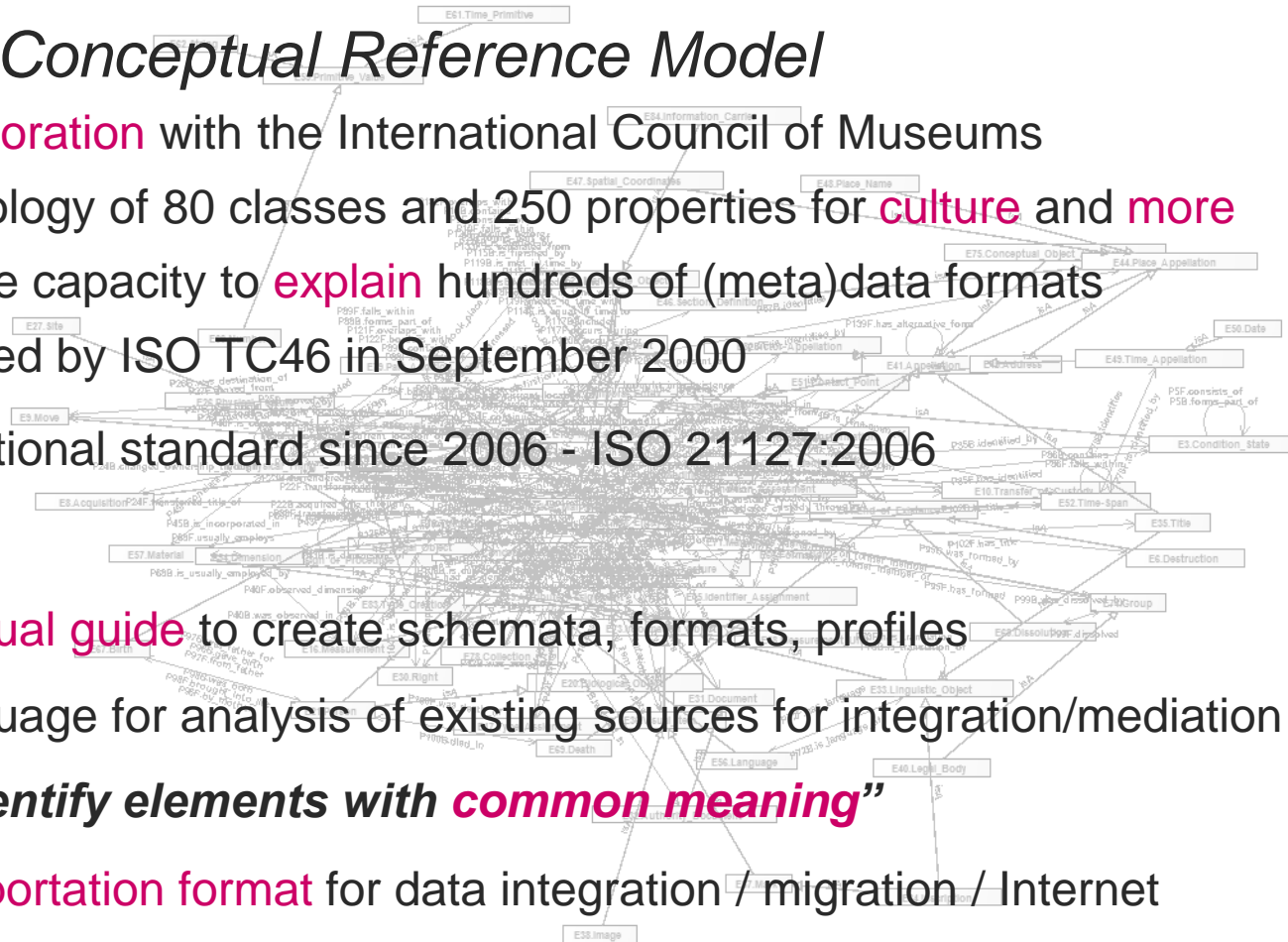
CIDOC Facts

The CIDOC Conceptual Reference Model

- A **collaboration** with the International Council of Museums
- An ontology of 80 classes and 250 properties for **culture** and **more**
- With the capacity to **explain** hundreds of (meta)data formats
- Accepted by ISO TC46 in September 2000
- International standard since 2006 - ISO 21127:2006

Serving as:

- **intellectual guide** to create schemata, formats, profiles
- A language for analysis of existing sources for integration/mediation
“Identify elements with *common meaning*”
- **Transportation format** for data integration / migration / Internet



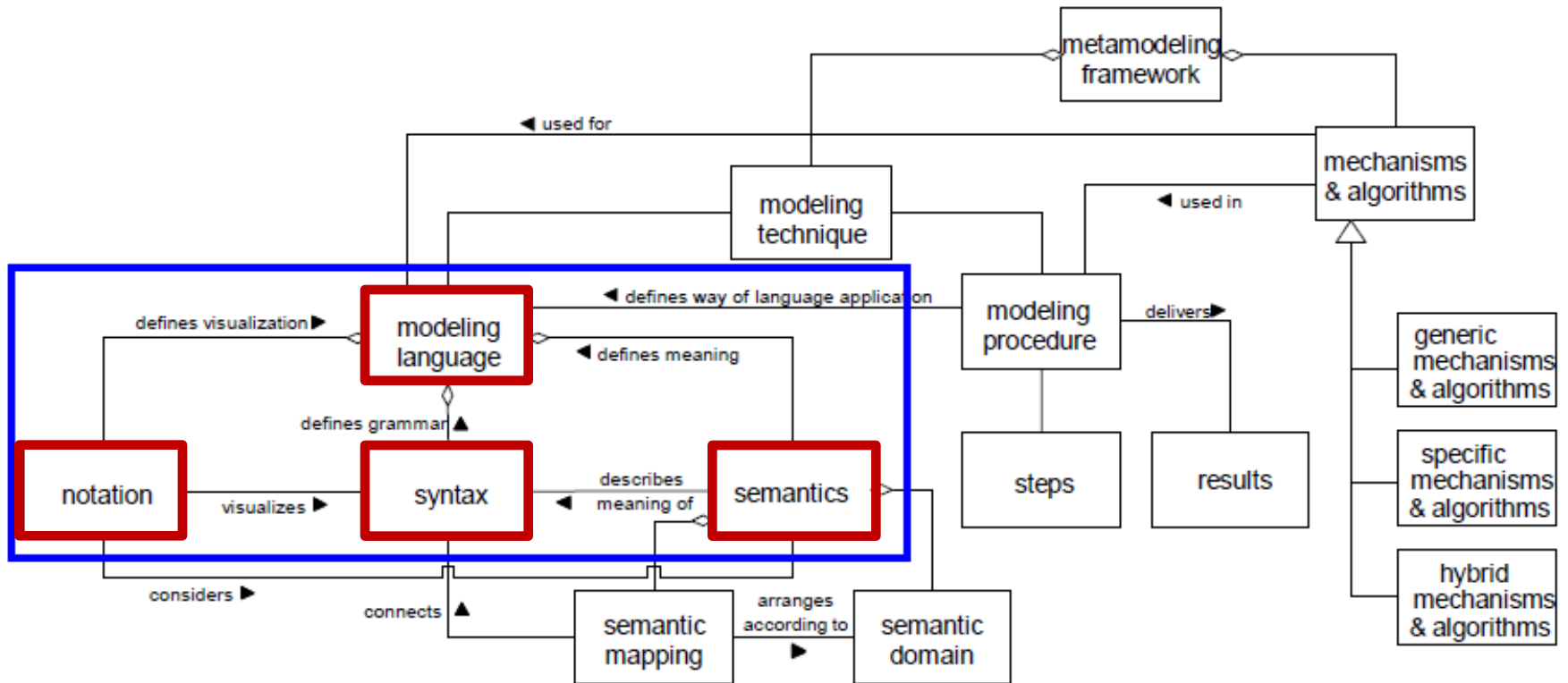


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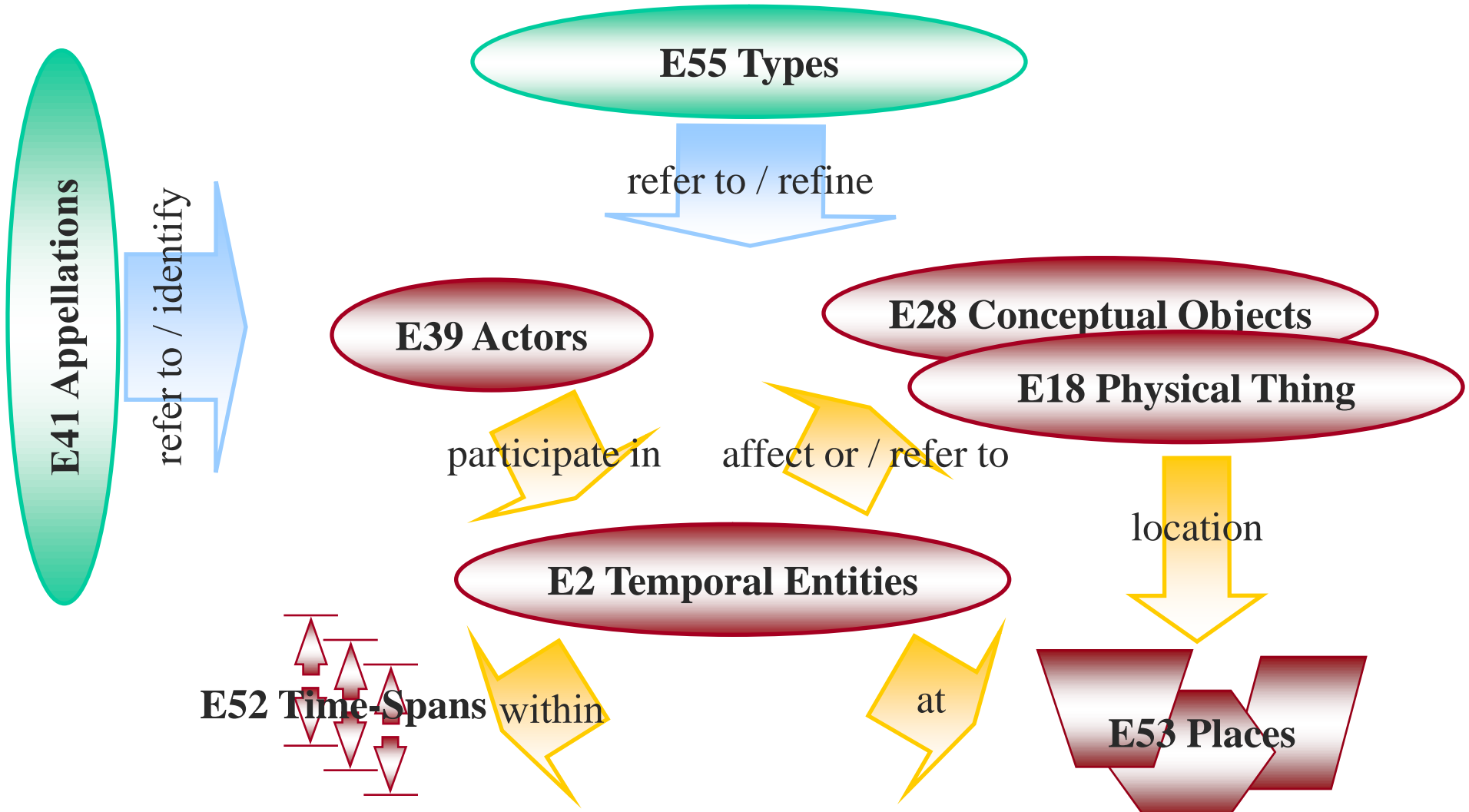
CIDOC-CRM as a Modelling Language





The CIDOC CRM:

Foundational Classes





The CIDOC CRM:





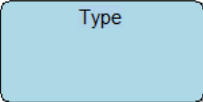

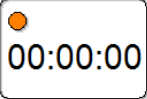



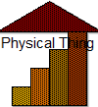



Coverage of CRM Relationships

- **Identification** of real world items by real world names or identifiers
- **Observation** and **Classification** of real world items
- **Part-decomposition** and structural properties of Conceptual & Physical Objects, Periods, Actors, Places and Times
- **Participation** of persistent items in temporal entities
 - *creates a notion of history: “world-lines” meeting in space-time*
- **Location** of periods in space-time and physical objects in space
- **Influence** of objects on activities and products and vice-versa
- **Reference** of information objects to any real-world item
- Physical things **carrying** information objects (tools and tool marks!)



The CIDOC CRM:

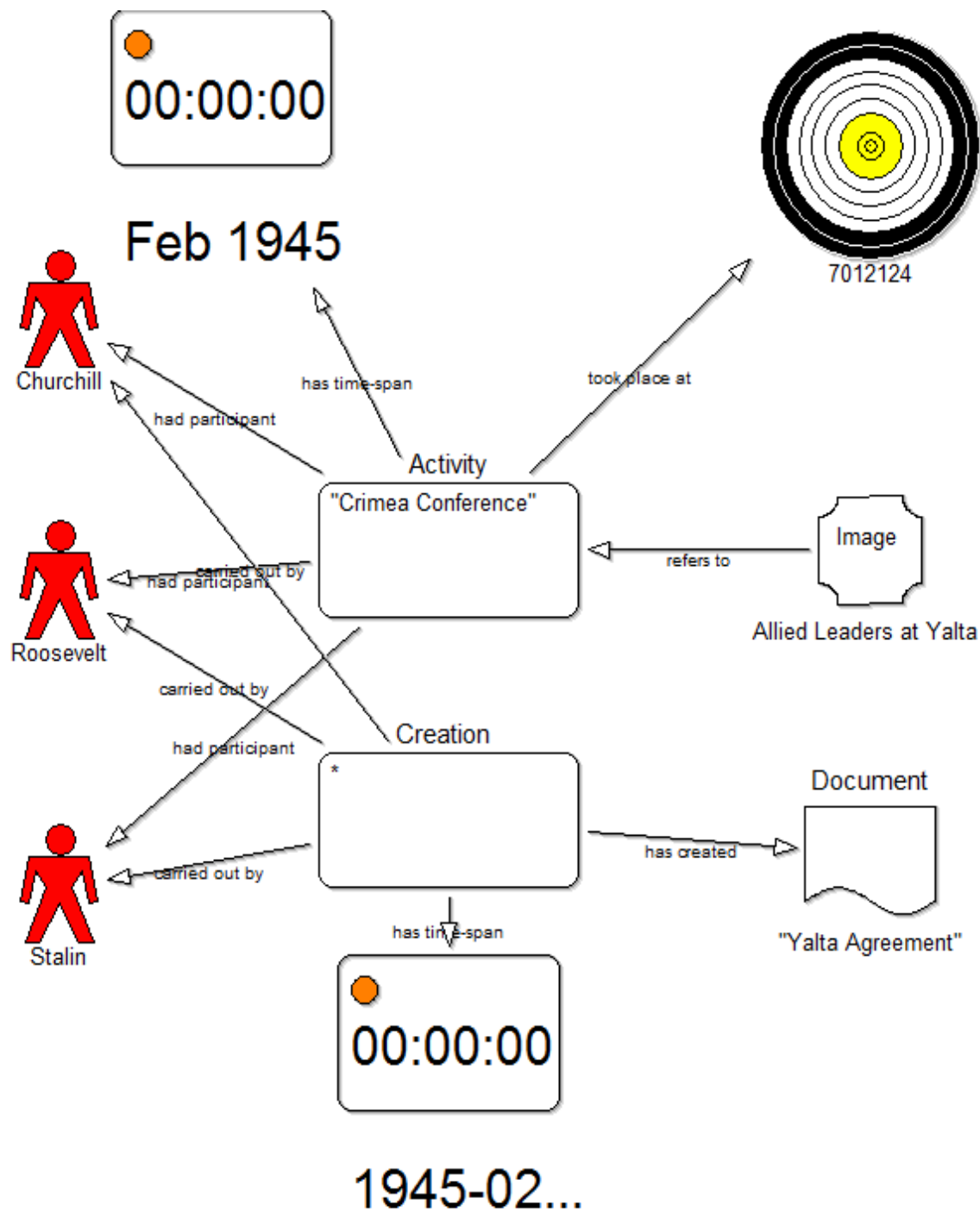
Notation of Foundation Classes

Notation	Class	Notation	RelationClass
	E41 Appellation	refers to 	refers to
	E39 Actor	had participant 	had participant
	E55 Type	took place at 	took place at
	E52 Time-Span
	E53 Place
Temporal Entity 	E2 Temporal Entity	has time-span 	has time-span
Physical Thing 	E18 Physical Thing	is identified by 	is identified by
	E73 Information Object	has type 	has type



The CIDOC

The example Model
In AdoXX





The CIDOC CRM:

Second Example In AdoXX

Church of Panagia Hodegetria

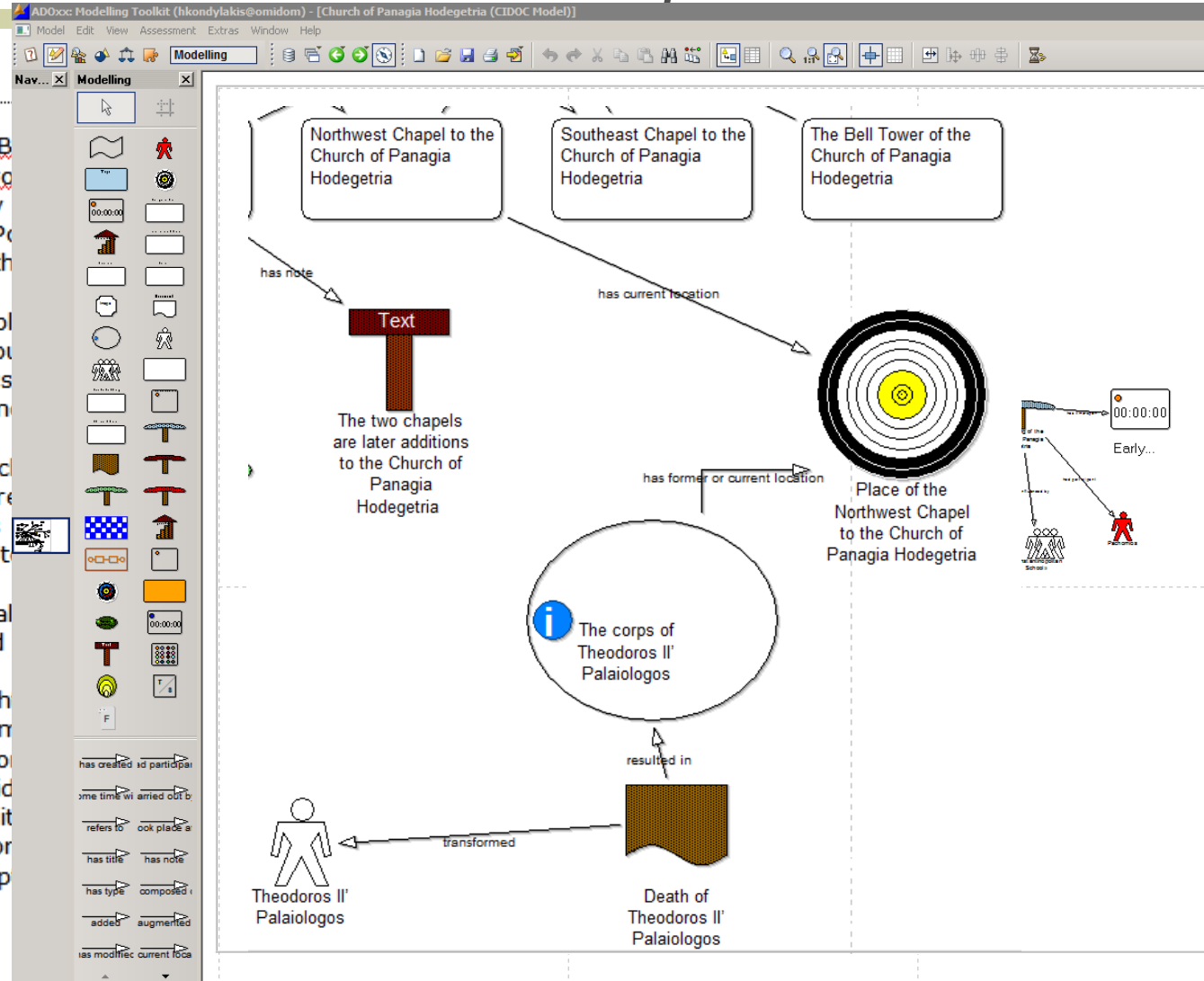
Panagia Hodegetria church, newer katholikon of B known also as 'Aphendiko Church', after Theodoro in the NW chapel, was built in the early 1420s by in the northern sector of the Low Quarter (Kato P inclined location. In its immediate surroundings the buildings of the monastery.

Hodegetria Church constitutes the earliest exampl which combines a three-aisled basilica on the gro type church on the upper level. Its exterior shows the diligent adaptation of the building to the inclin its volumes.

Its tall nucleus is surmounted by four domes whic at gallery level; a fifth dome surmounts the cente porticos, one presently blocked, and four chapels (additions) together with the tall and slender bell t buildings.

The monument as a whole displays exquisitely bal influence of the 'Constantinopolitan School' (blind apses which are polygon-shaped on the outside).

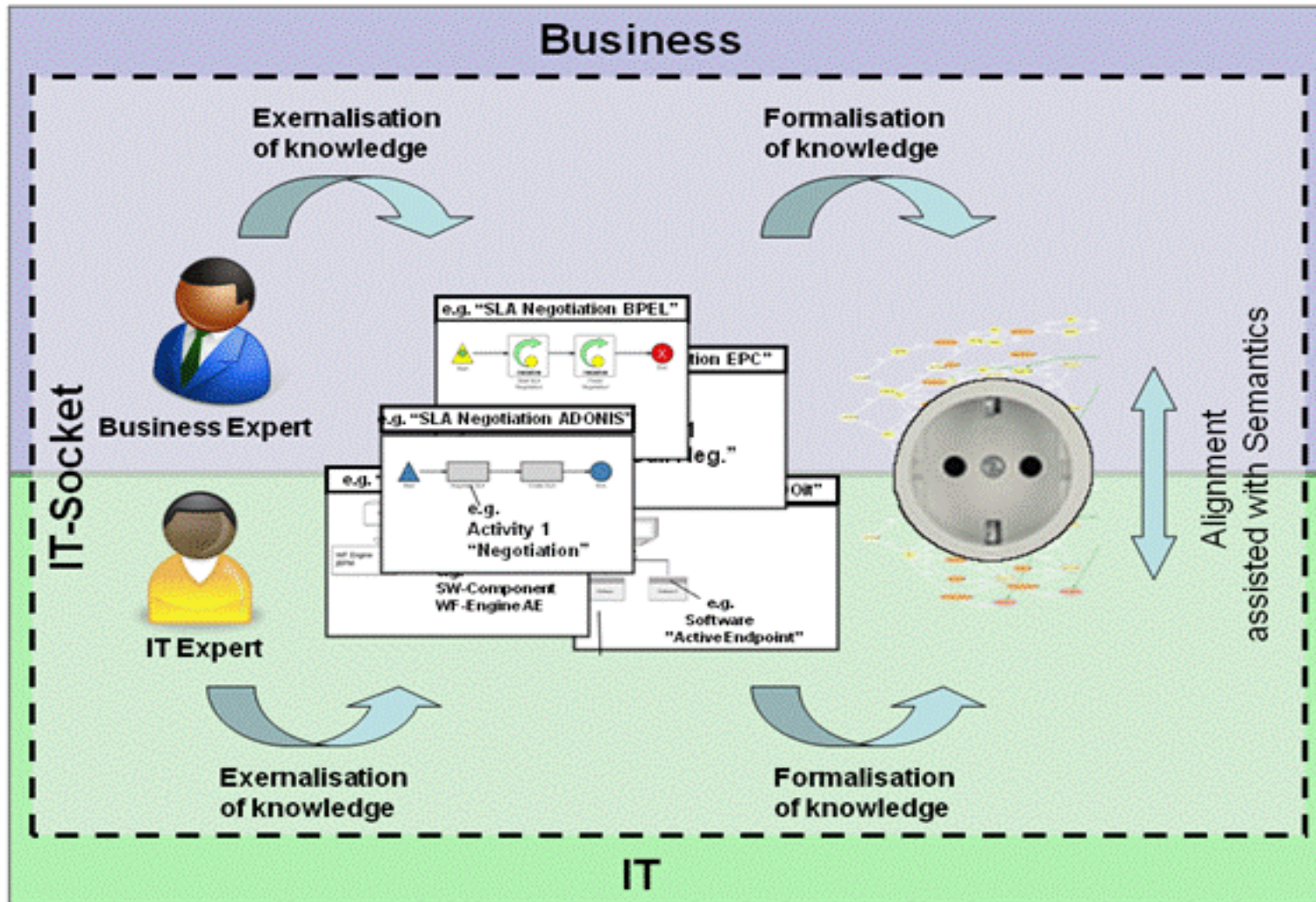
The interior is marked by diligently graduated ligh paintings, which originally coexisted with lateral n floor, and shows the extent of Pachomios' ambitio was not invulnerable to time. It suffered consid was abandoned, notably the removal of some of it which caused extensive collapse. Thanks to restor the monument recovered its form, with the excep porticos.





The CIDOC CRM:

CIDOC-CRM contributing to OMI through plugIT

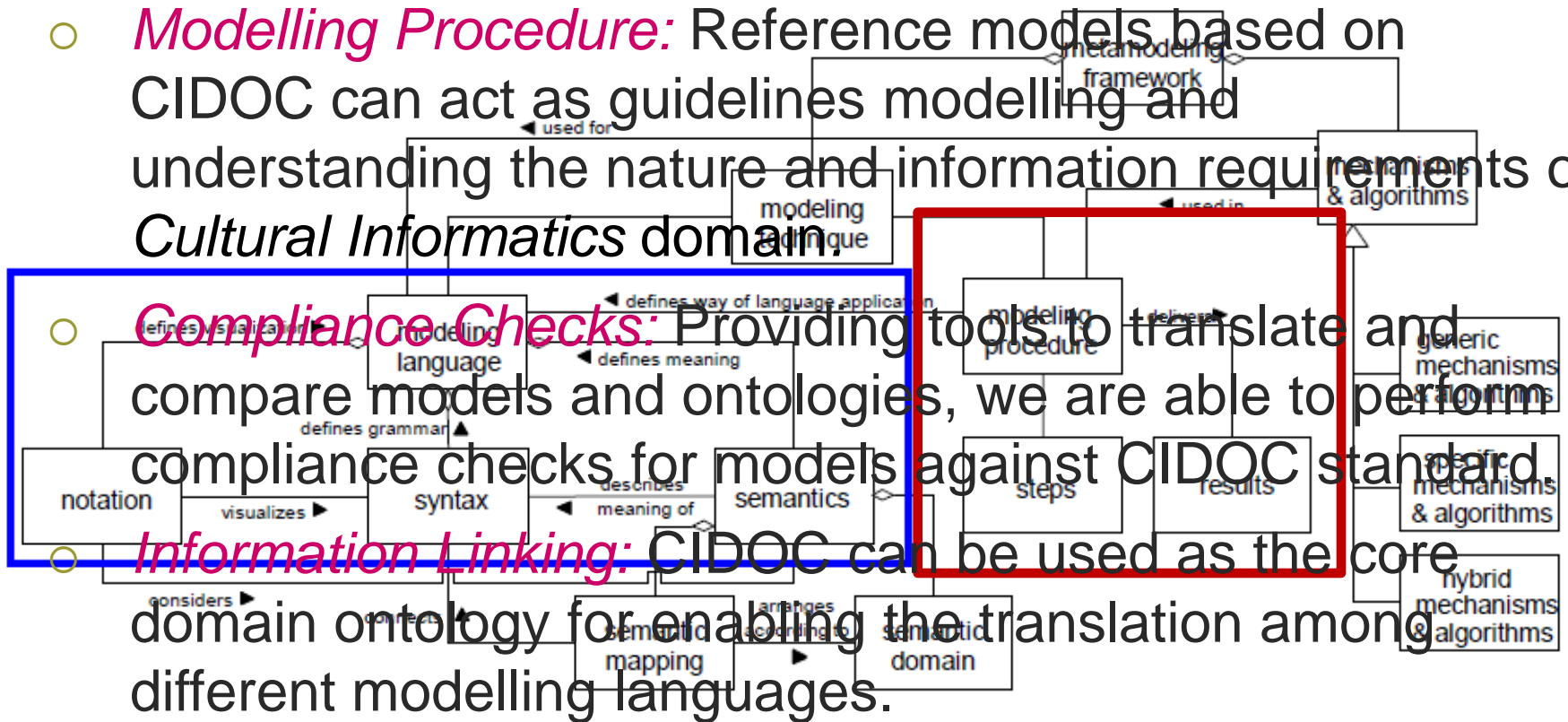




The CIDOC CRM:

CIDOC-CRM contributing to OMI through plugIT

- *Modelling Language*
- *Modelling Procedure:* Reference models based on CIDOC can act as guidelines modelling and understanding the nature and information requirements of *Cultural Informatics* domain.



○ *Compliance Checks:* Providing tools to translate and compare models and ontologies, we are able to perform compliance checks for models against CIDOC standard.

○ *Information Linking:* CIDOC can be used as the core domain ontology for enabling the translation among different modelling languages.



The CIDOC CRM

THANKS !!



The CIDOC CRM:

AdoXX possible enhancements

- Support of *Multiple Inheritance* in Classes
- Support of *groups* and *views* of Classes/
RelationClasses
- *Hierarchical presentation* of Classes/
RelationClasses



The CIDOC CRM:

Reasoning with the CRM

- The CIDOC CRM describes *material facts* (what has happened in the sense of physics) in terms of base classes and relationships.
- It *relates things and events* to open terminologies representing and linking to social and scientific *categorical hypotheses*.
- Thereby you can document the *evidence for hypotheses* and *deductions from hypotheses*.



The CIDOC CRM:

Reasoning with the CRM

- The CRM can be **extended** to **relate all** reported, observed and inferred **facts** with your categorical **hypotheses** of “Binding” (3 general properties):
 - ‘*Binding Style xy*’ (E55.2 *Technique Type*)
 - used to result in:** ‘*Nod xy*’ (E55.1 *Feature Type*)
 - in use during:** *ca1610 – ca1680* (E52 *Time-Span*)
 - in use at place :** ‘*France*’ (E53 *Place*)
- You may refine give a structural account of your hypotheses (technique and feature) by defining relationships of a **model of books**



The CIDOC CRM:

Conclusions

- **More important** than an extended terminology is a language of relevant structural **relationships to compare** and relate terms.
- **More important** than a common data structure is a **standard** ontology of relationships for **shared explanations** of different data structures.
- Compatibility with the CRM allows for machine readable integration and relationship detection
 - *e.g., propagation of place of binding from hypothesis to **suggest** new facts.*
- **Explicit hypotheses formulation** and **matching with evidence** enables new forms of scientific **documentation**, transparent **argumentation** and distant, diachronic **collaboration**.