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informatie-architectuur

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Towards a conceptual model of the physical environment

NCG Symposium

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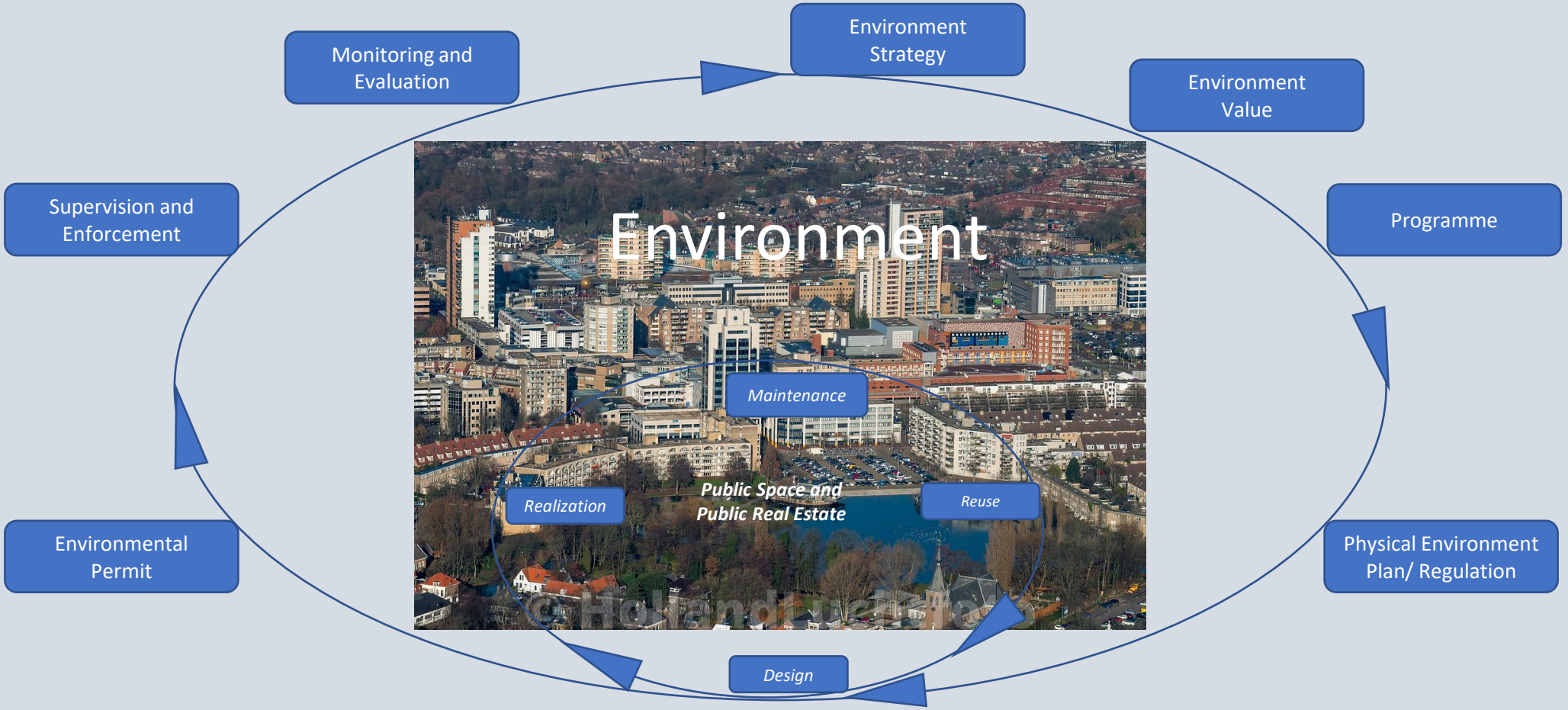
1. Issue

Aim: the Environment and Planning Act needs DATA COHERENCY



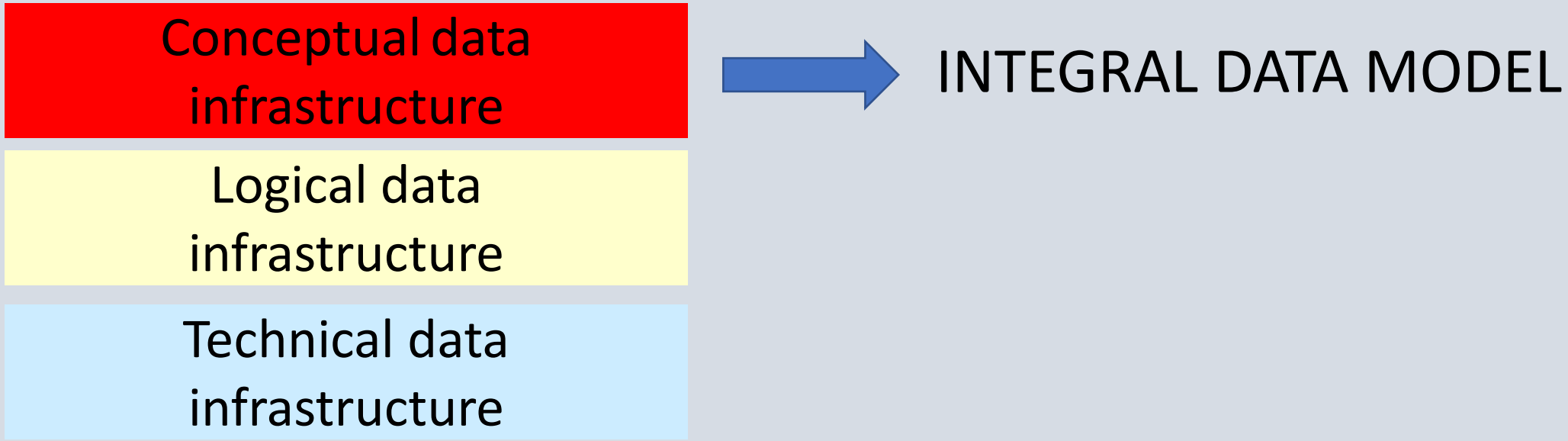
Issue: Incoherency!

E.g. data for the purpose of the Environment Strategy:

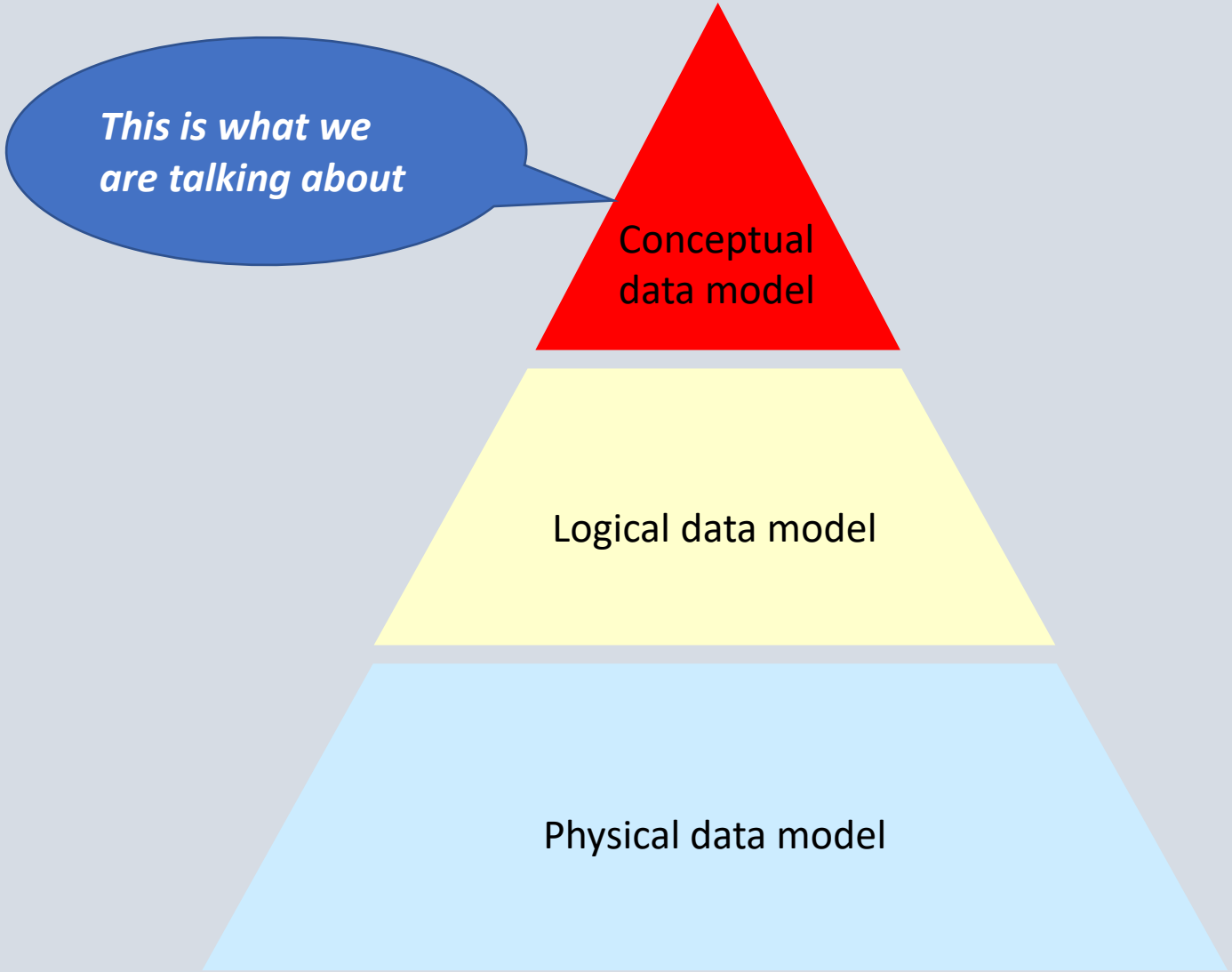
- No collective strategy statement
- Undocumented data (data without metadata)
- Per subdomain: many, mostly analog, collections of data
- Per project: separate, specifically relevant collections of data

How can coherency be achieved?

Data infrastructure (a common facility for data management):



Conceptual data model



- Semantics
- Classes, properties, relationships, etc.
- Target group: users /domain experts and information analists

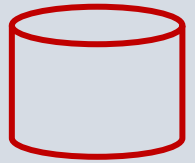
- Tables, tuples, columns, keys, etc.
- Formal specification
- Target group: designers, builders and administrators

- Design technical solution: database, data store, data warehouse, semantic web solution, etc.

A solid data model leads to:

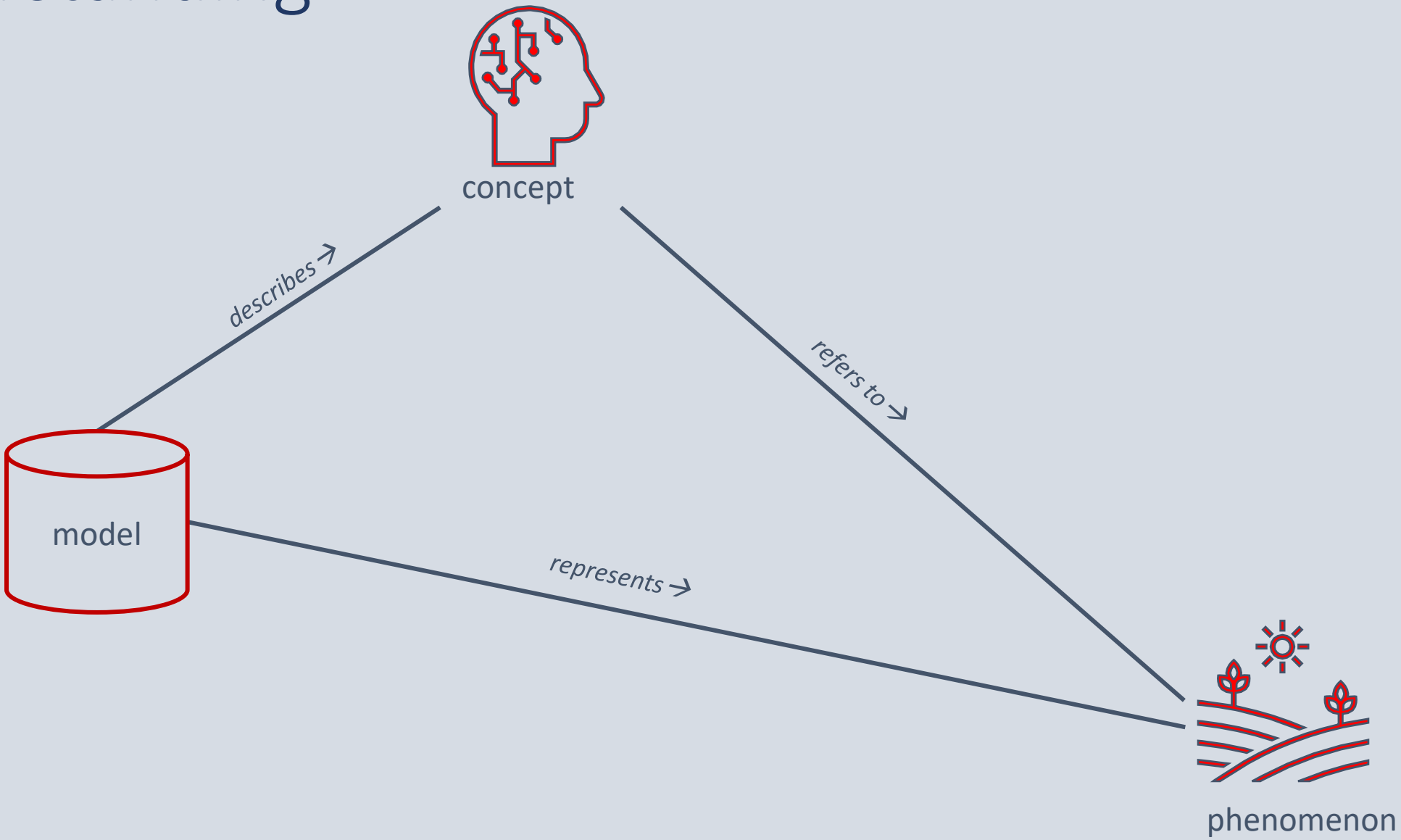
- Effective and Efficient data provision
- Quality data

For example through once recording and multiple use



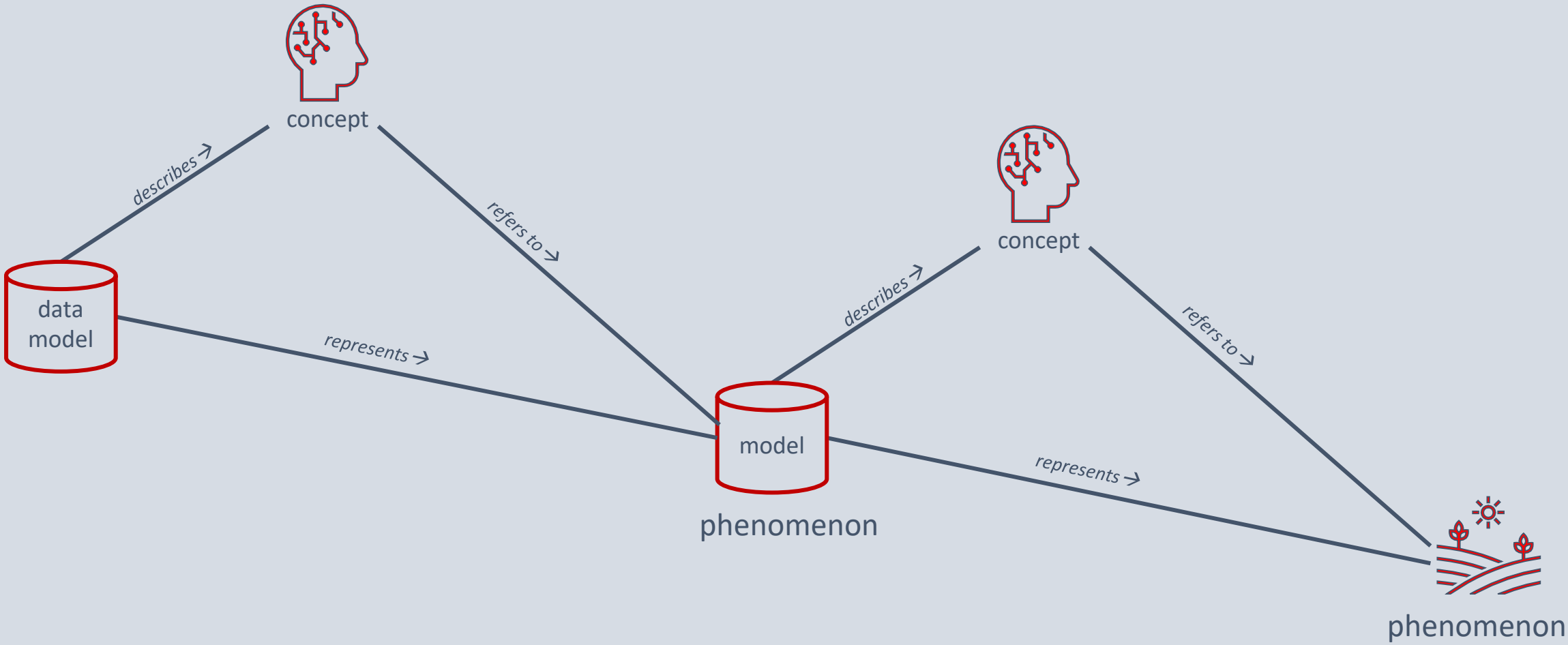
and to a THOROUGH (COMMON) UNDERSTANDING of the data

Understanding data



Understanding data

If You understand what I mean (Olivier B. Bommel)

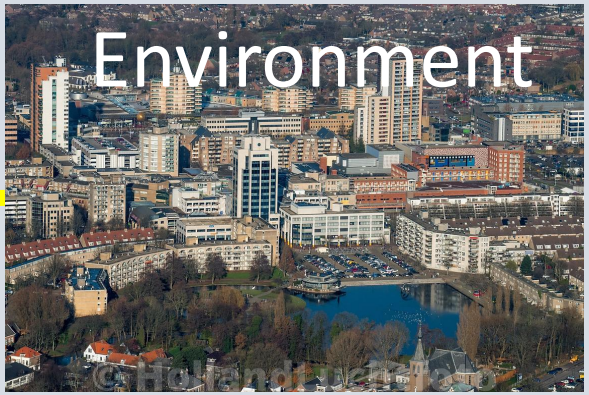


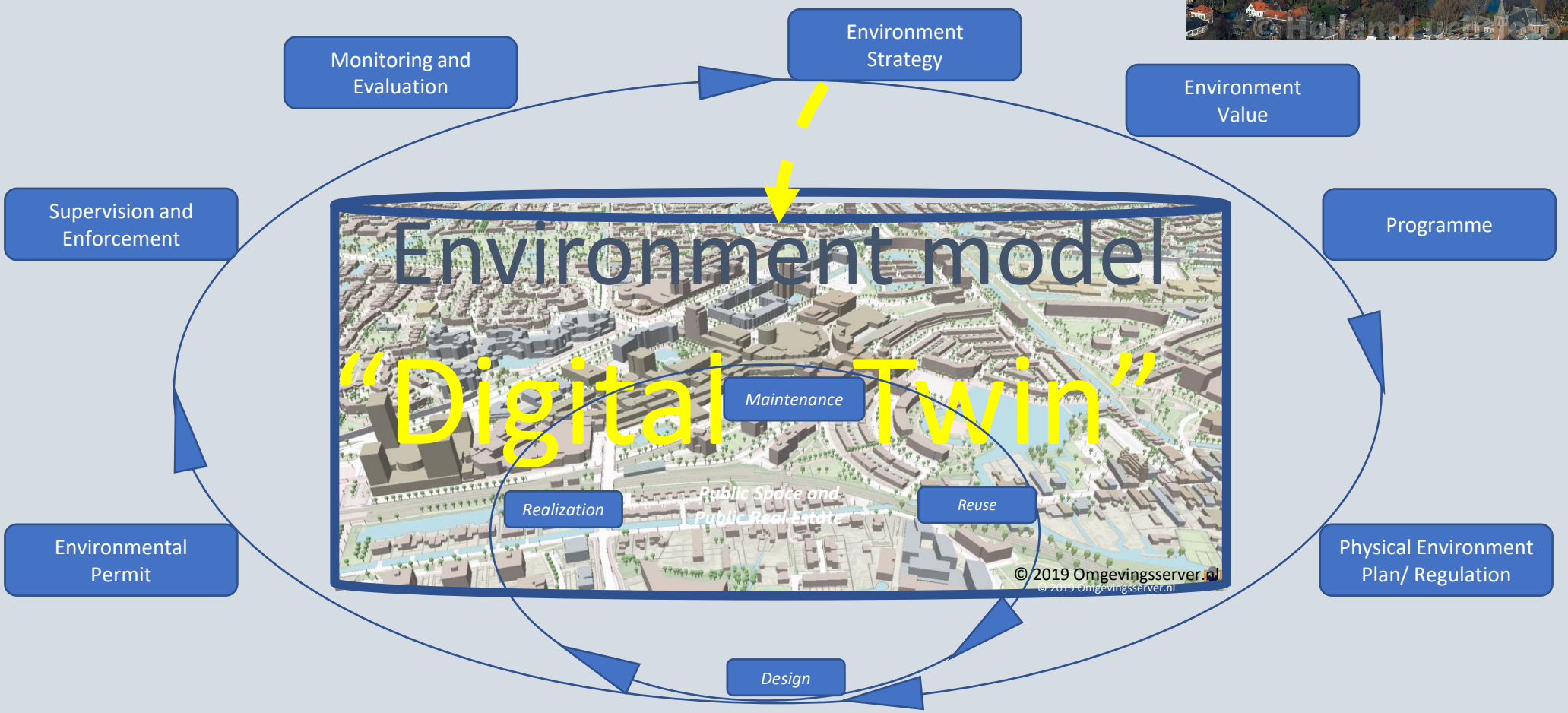
‘Data model’ or ‘Ontology’?

- A data model is a description of the structure of a collection of data

  ….. and so is an ontology
- The term ‘Ontology’ is usual in the domains of the semantic web and in AI and is implemented with specific languages and methods
- This presentation is about data models in general, and includes the concept of ontologies.

2. Environment model





Input and Output

Basic data

Core data

Process data

Reports

BIM

Research data

Sensor data

Internet Data

Etc. etc.

Noise pollution analysis

Flora/fauna analysis

Energy analysis

Simulation

Augmented Reality

Info for architects

Rule location scope

Environment data

Etc. etc.

Physical/Digital Model and Data Model

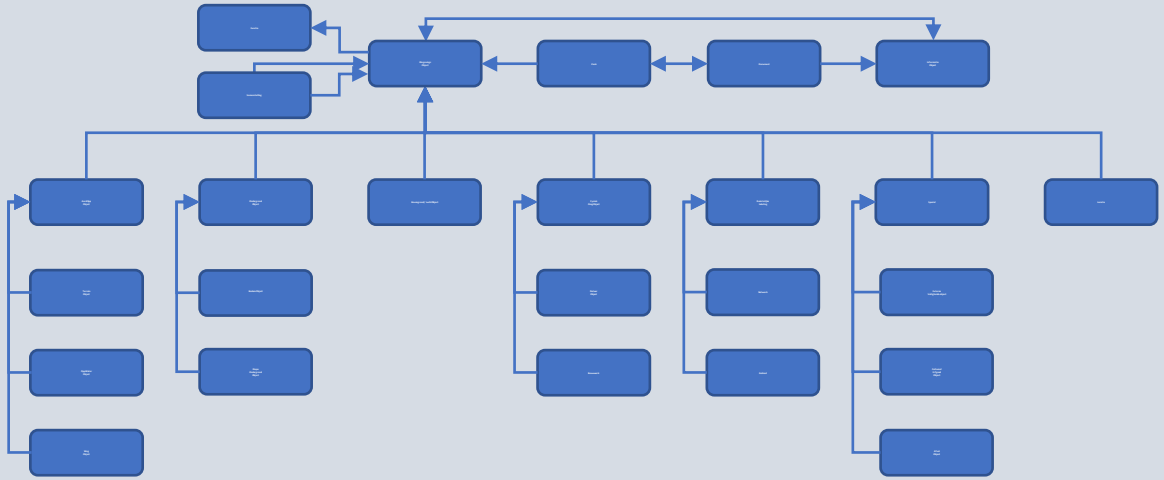
Environment model

objects

classification

instantiation

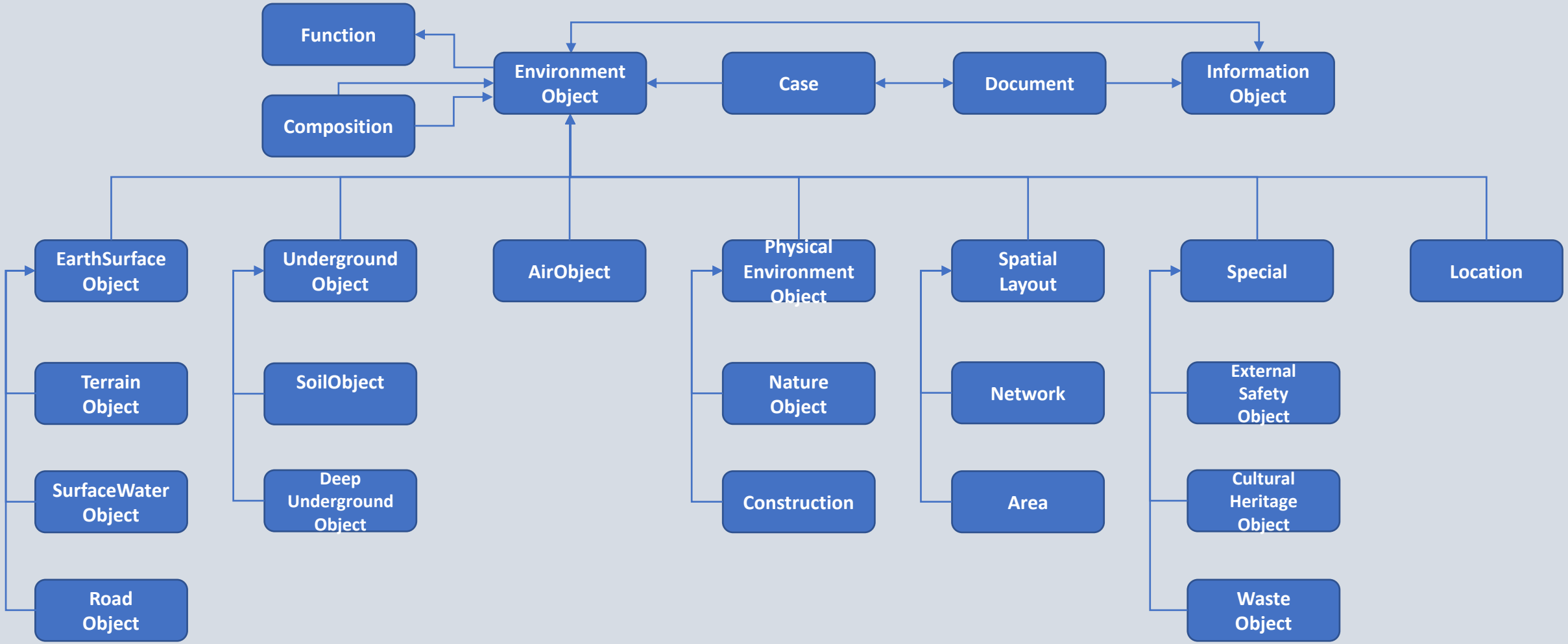
Environment data model



classes

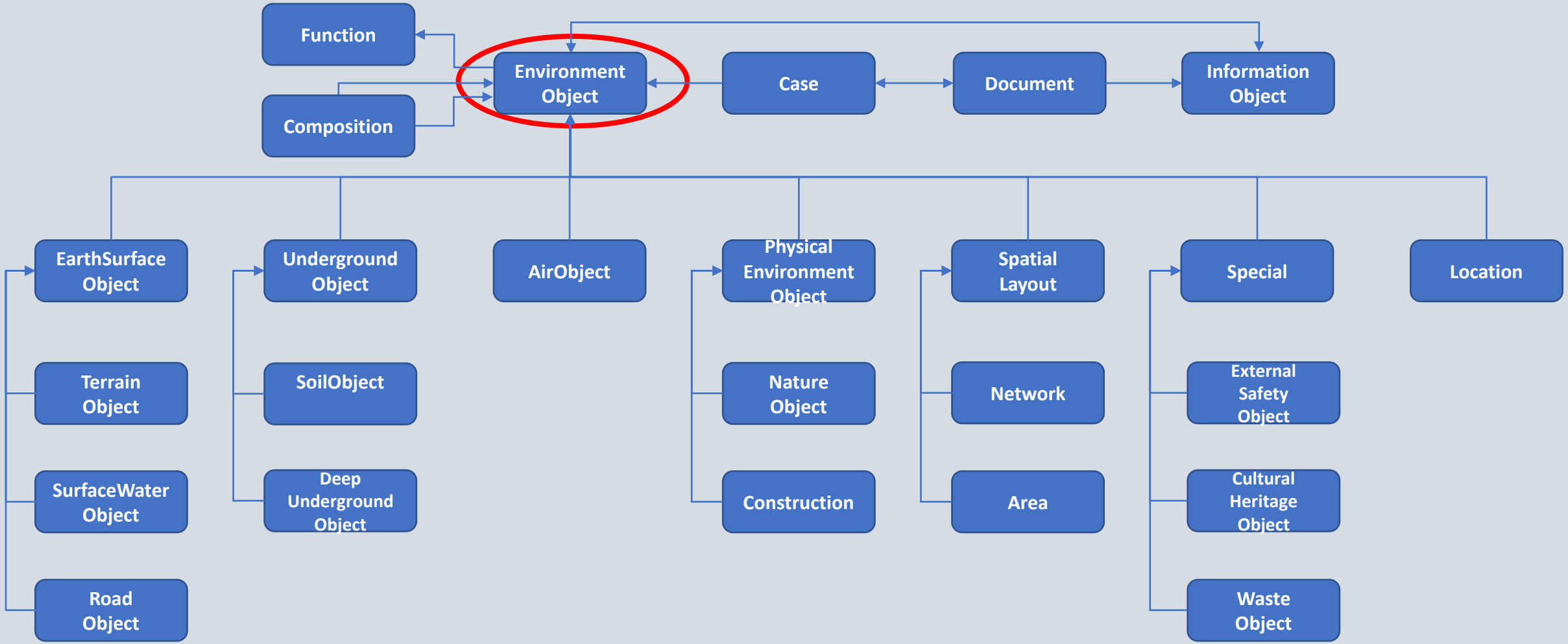
3. Environment data model

provisional



3. Environment data model

provisional



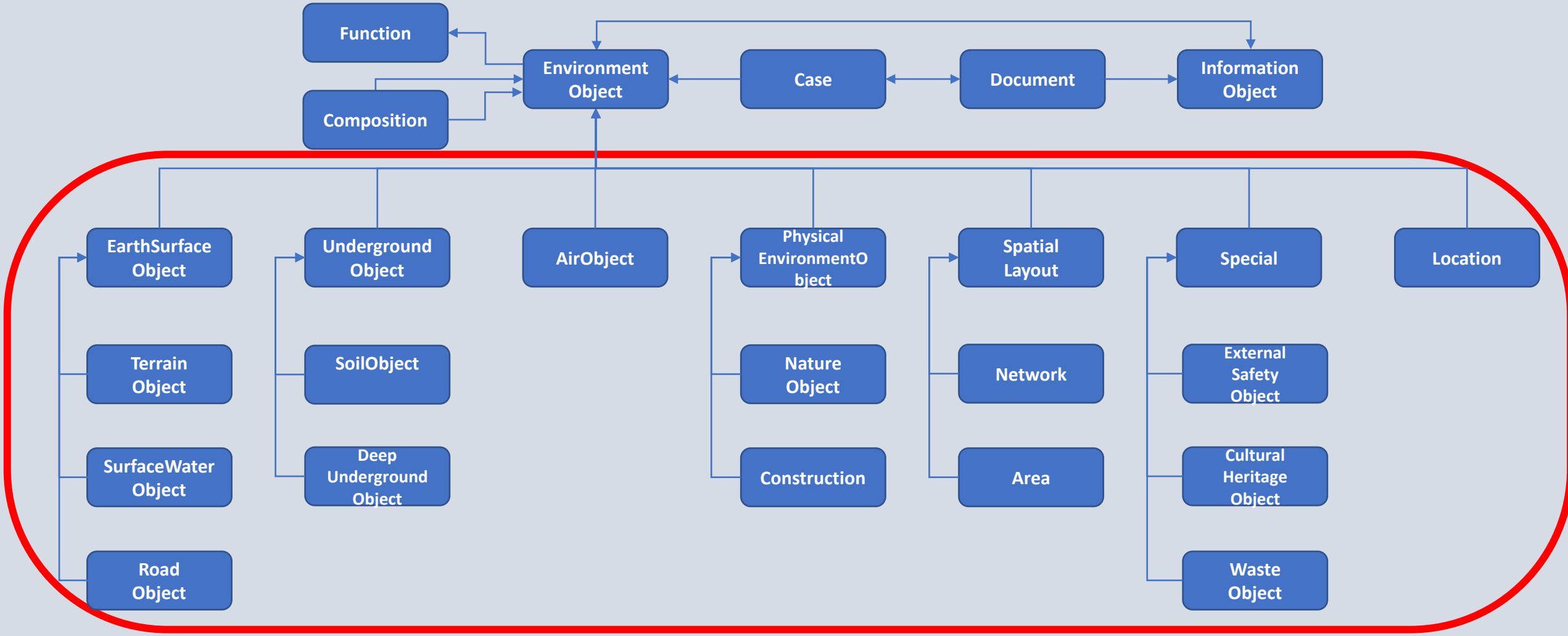
Definitions

- An EnvironmentObject is a SpatialArea, relevant to environment policy (PROVISIONAL DEFINITION)
- A SpatialArea is a demarcation in space (NTA 8035 (a Dutch technical agreement): Semantic modelling of data in the built environment).

  ➔ CEN standard Semantic Modelling and Linking Standard (SMLS)

3. Environment data model

provisional



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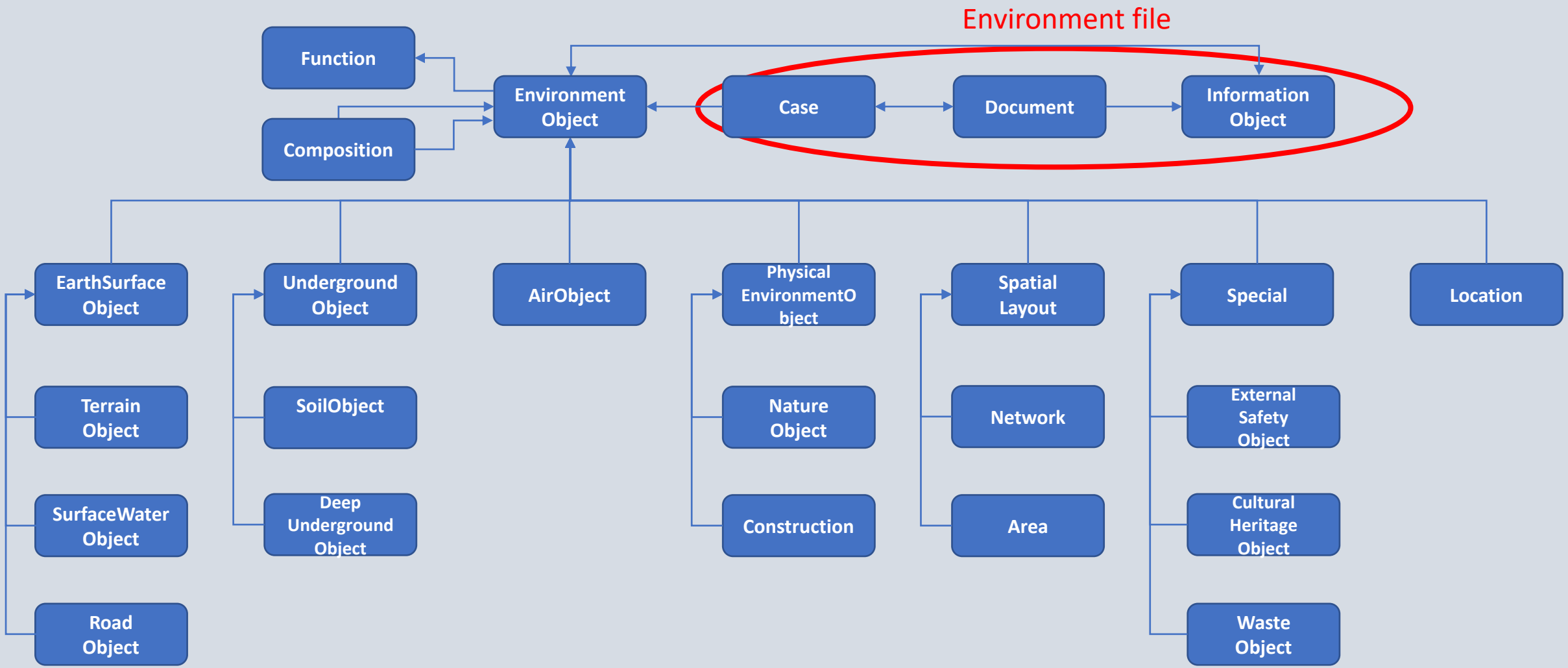
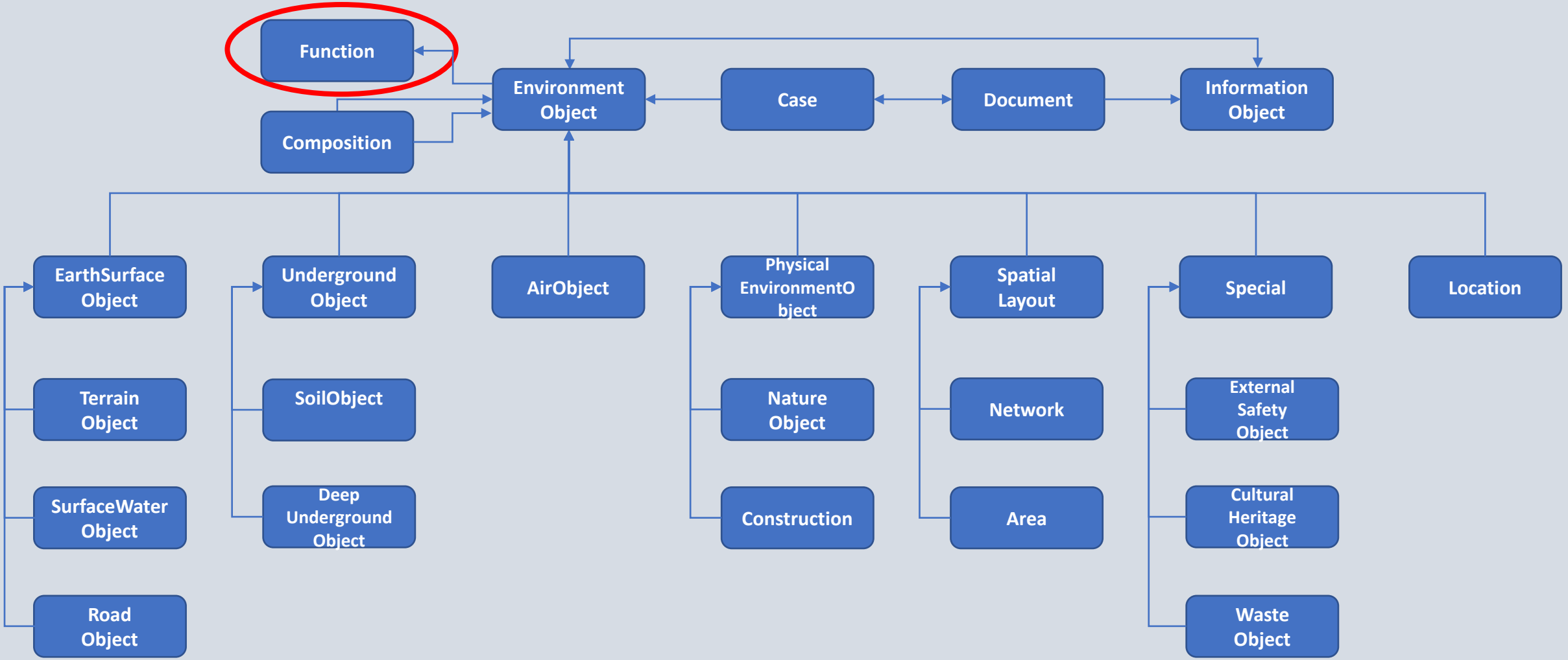
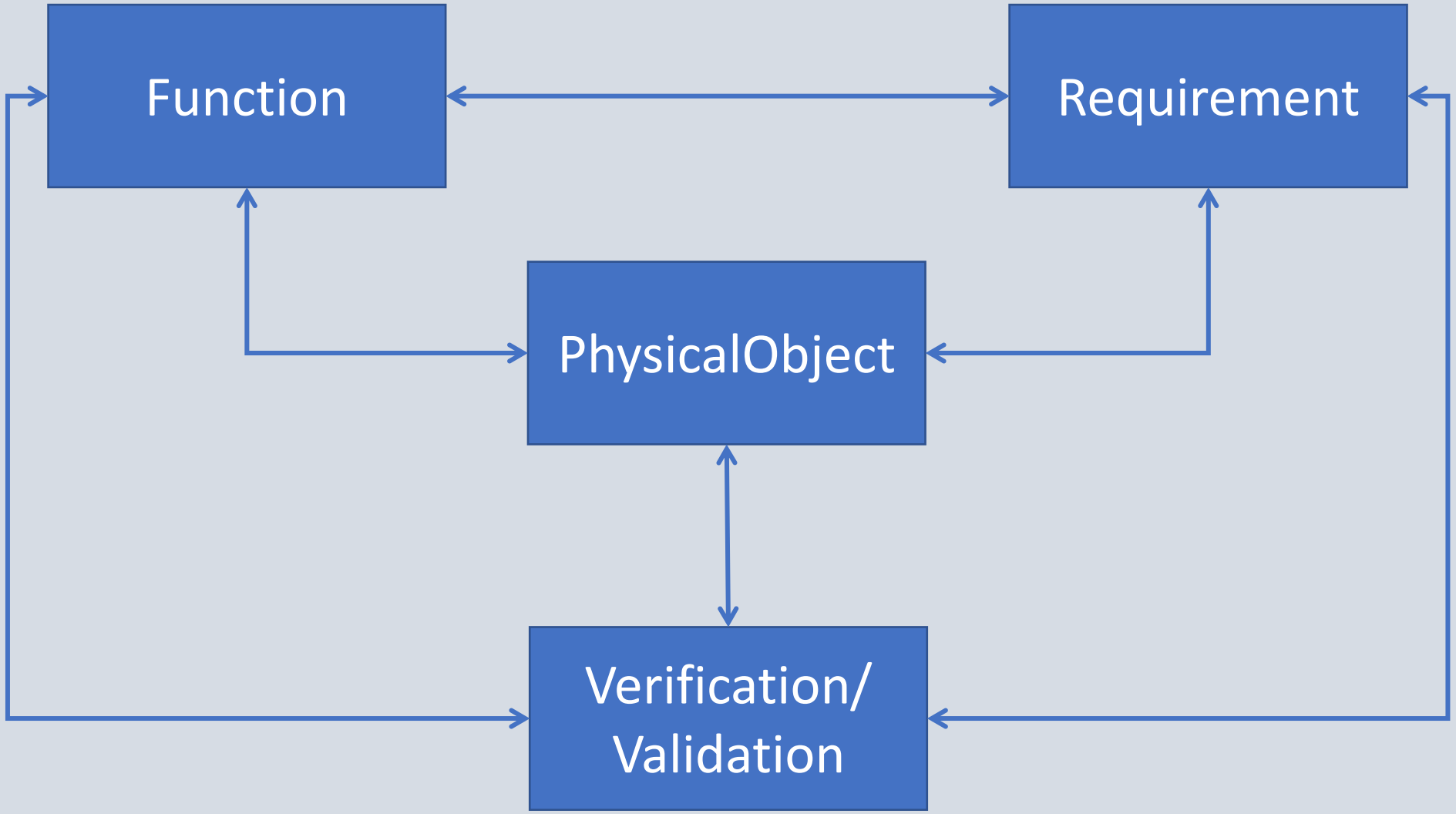


3. Environment data model

provisional

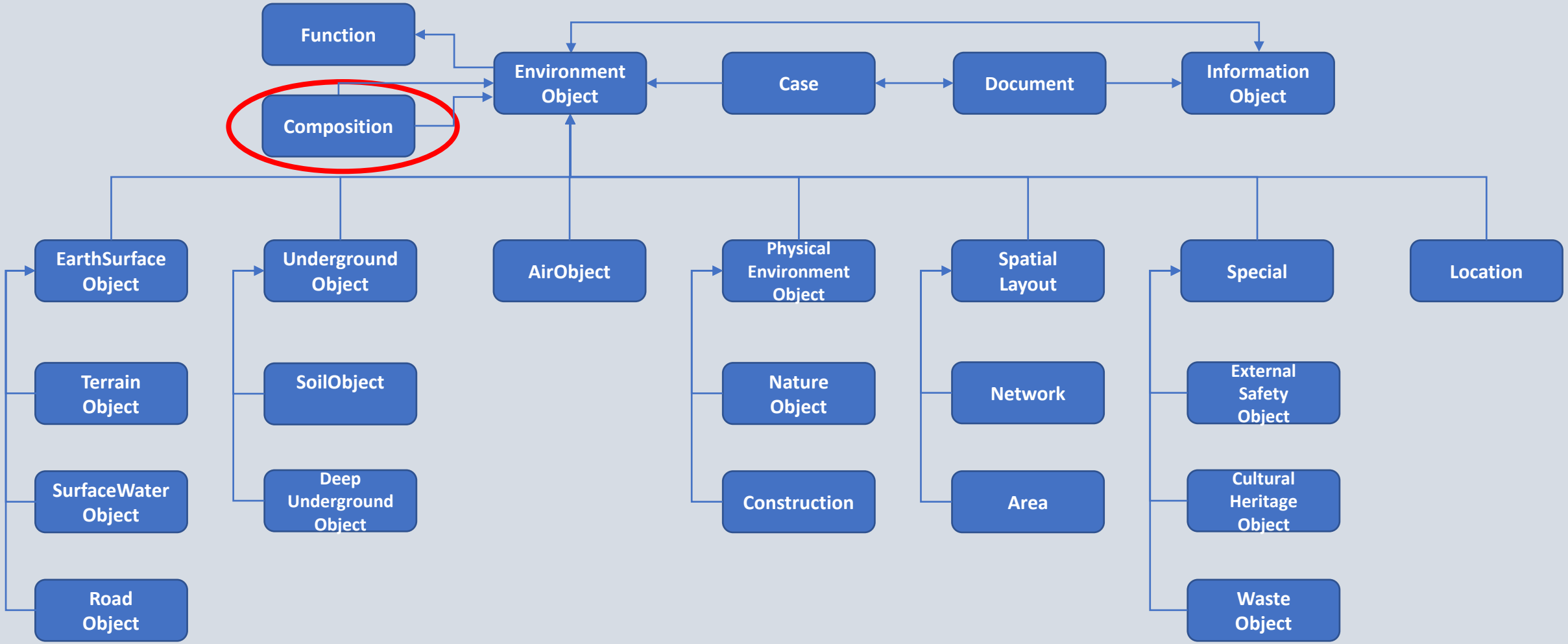


Systems Engineering

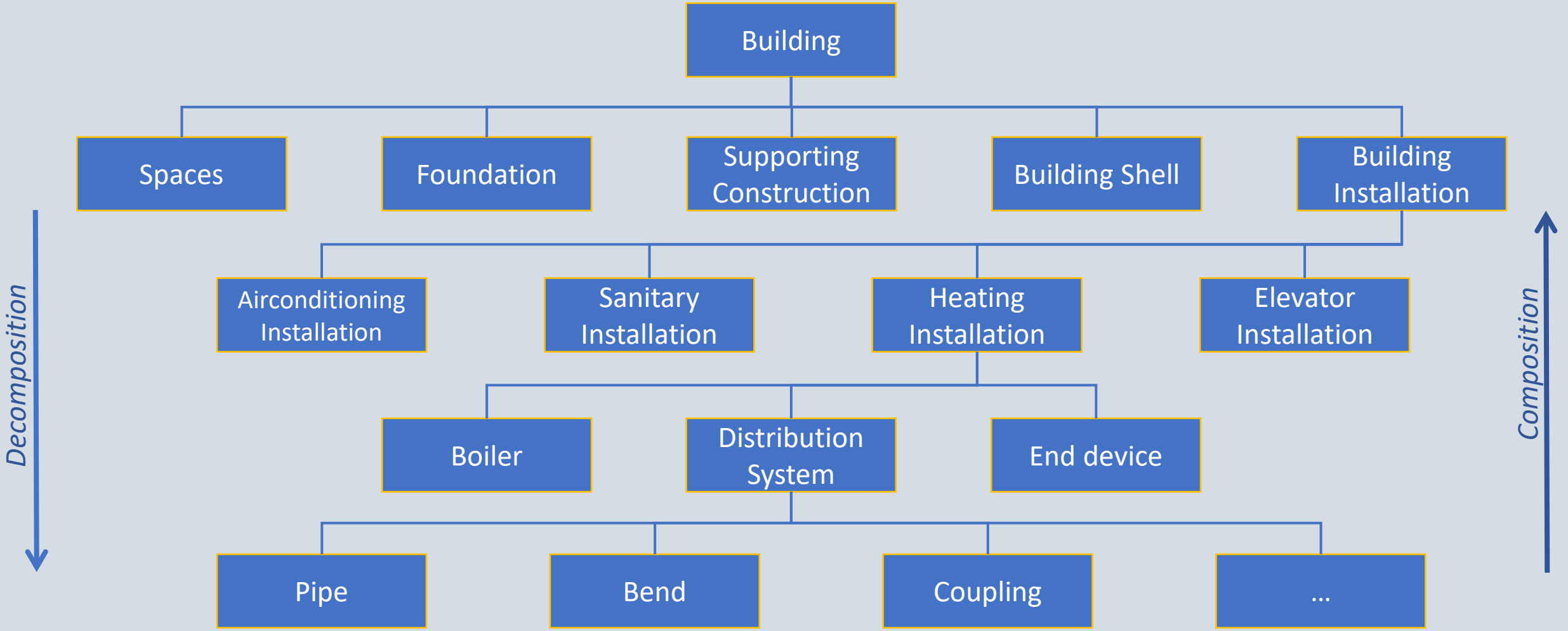


3. Environment data object

provisional

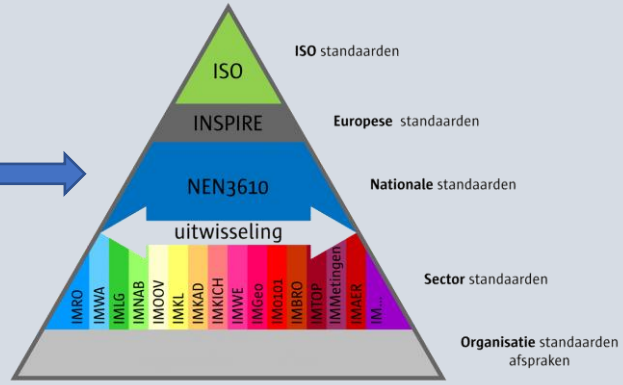


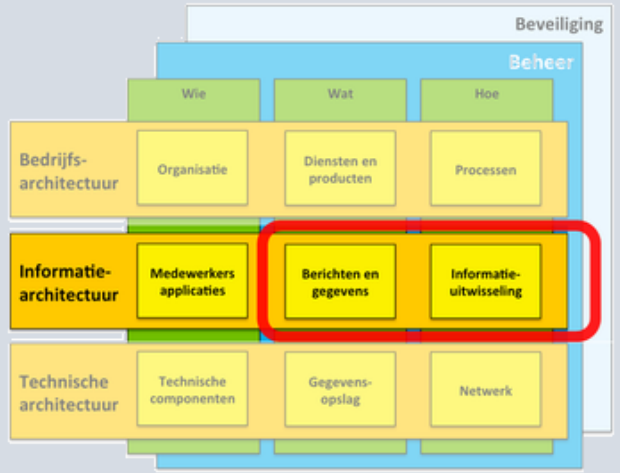
Composition



Work out with (Dutch and international) standards

- Environment Law Regulations and data models
- NEN-EN-ISO 19115/NEN 3610 + sector models
- Spatial Basic Registrations (Coherent Object Registration)
- Transport and traffic networks
- INSPIRE
- CityGML
- BIM standards
- Government standards on data infrastructure
- …… and more.

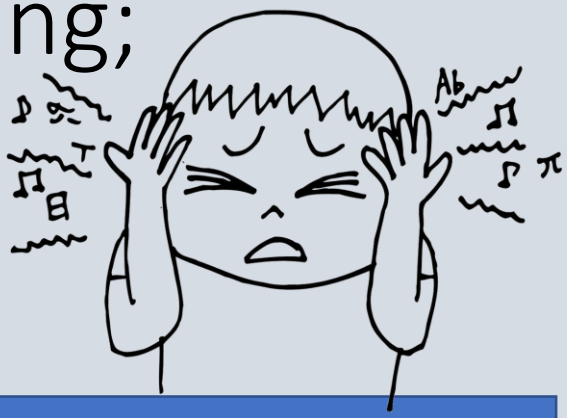


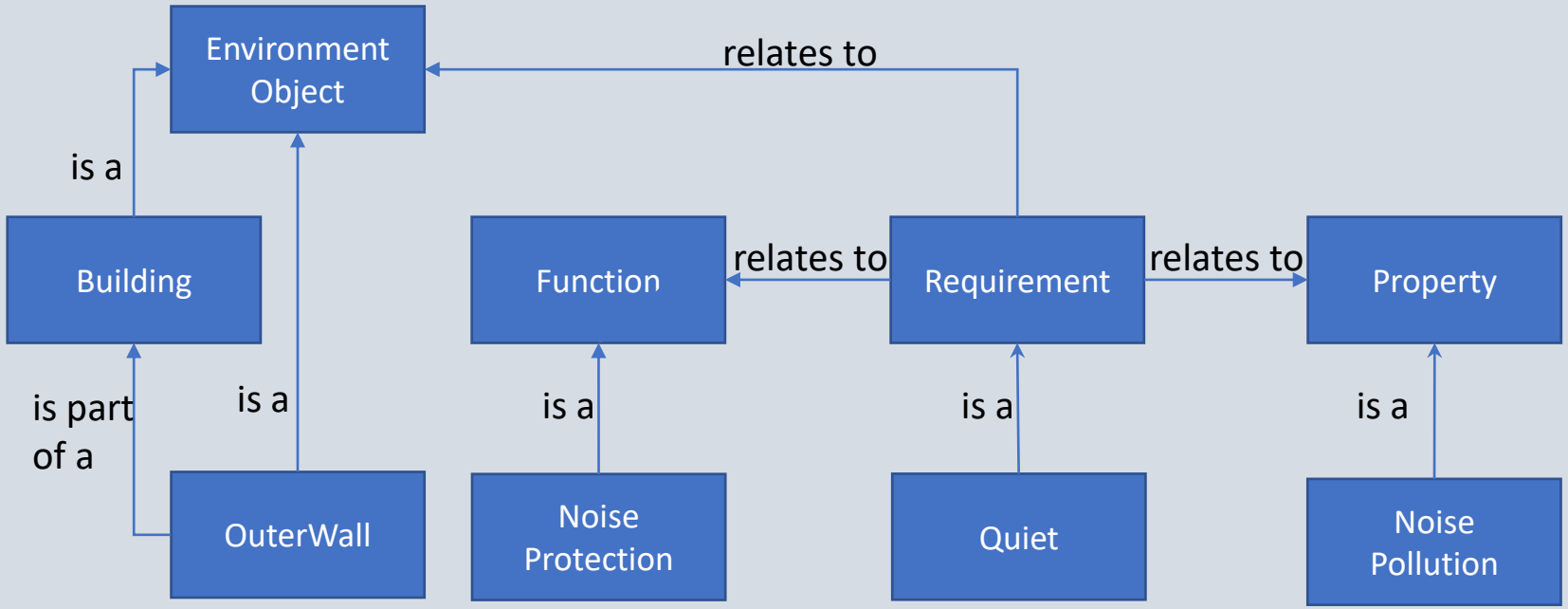


and existing thesauri and ontologies

- System Catalog of the Environment and Planning Act, ENVO, AQUO, NTA 8035, etc.

Use case: properties of objects for planning; design and monitoring & evaluation





instantiation

Noise Pollution
OuterWall nr I
Building 1234567

- present: 58 db(A)
- required <=55db(A)
- designed 52 db(A)
- verified: OK
- validated: still louder than expected!

4. Related models/ developments

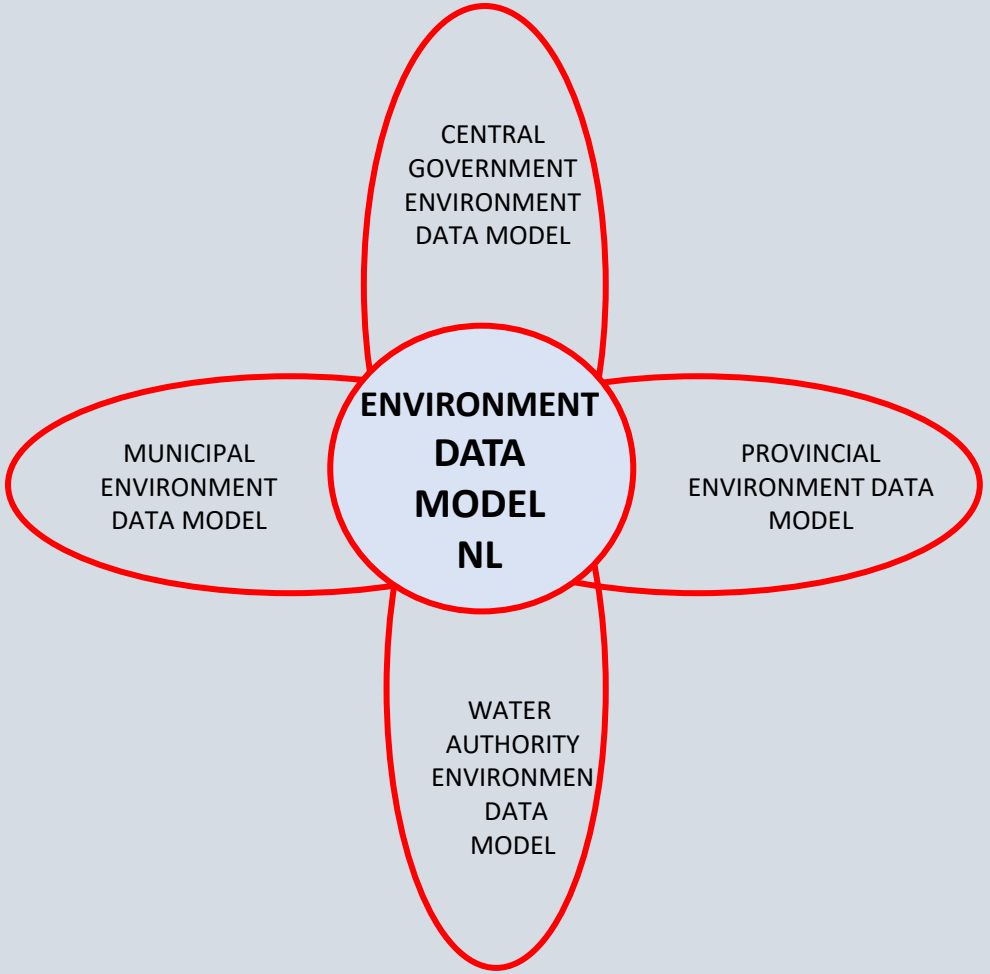
To discuss here:

- National context
- Digital System of the Environment and Planning Act

To discuss later/ elsewhere:

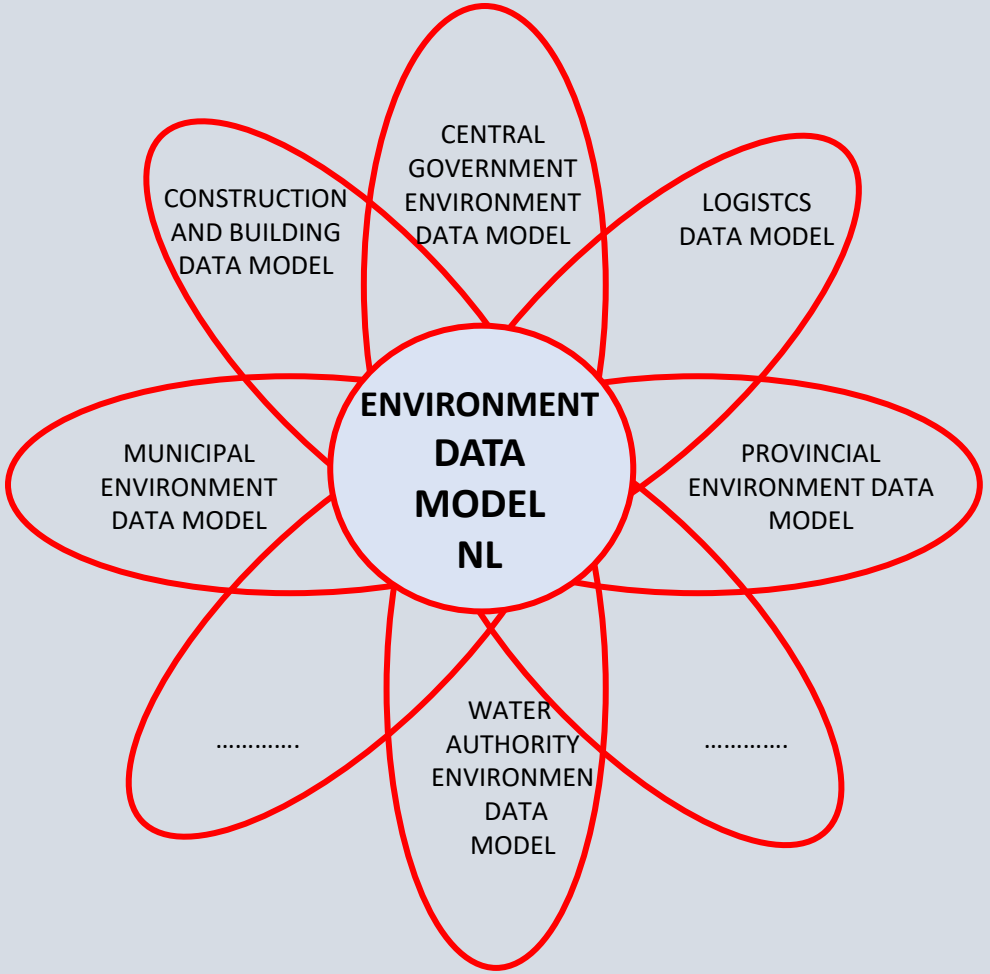
- Governmental Data Architecture
- Key Registers

Environment Data Model NL



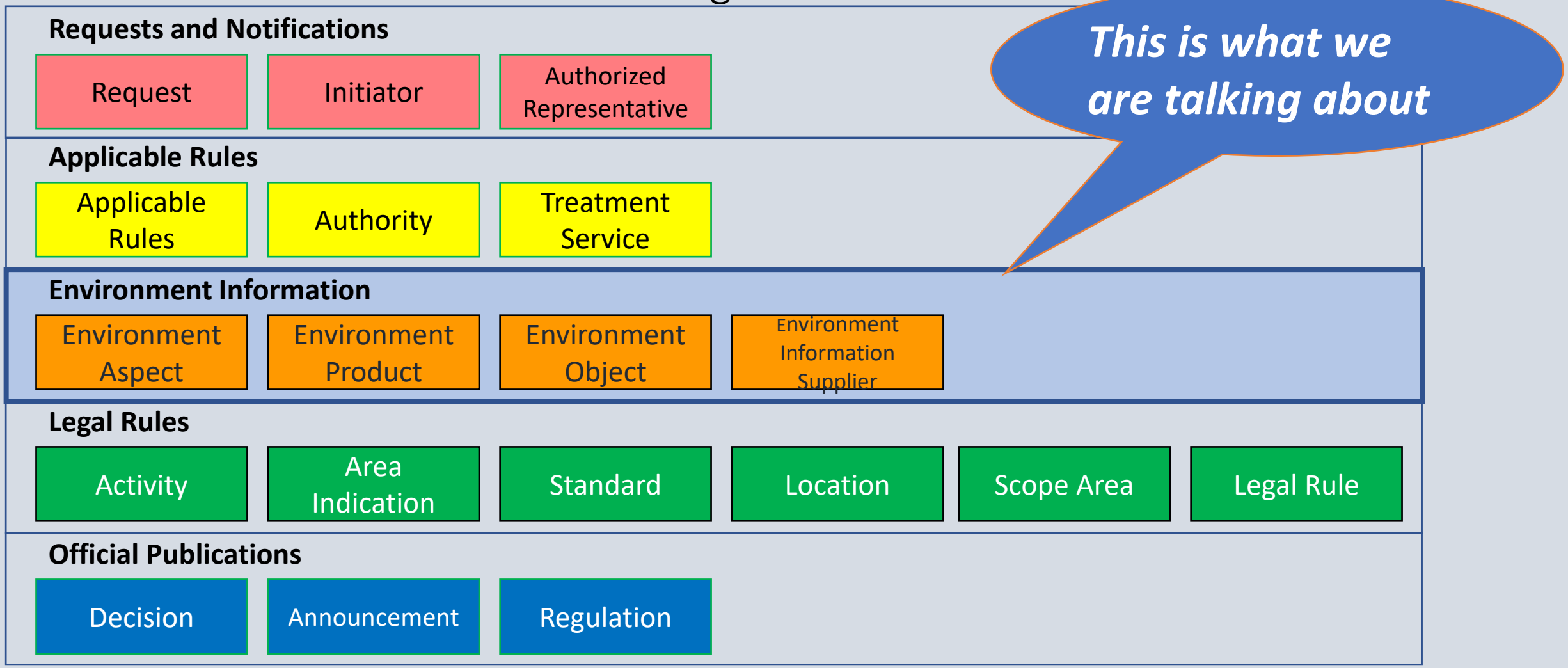
Government environment data model

Environment Data Model NL



Government Environment Data Model with extensions

Information Models and Business Objects of the Digital (Eco)System of the Environment and Planning Act NL



5. Conclusions

1. Implementation of the Environment and Planning Act requires an **Environment Model**.
2. The data architecture for that is captured in an **Environment Data Model** (expandable to an **Environment Ontology**).
3. The **Environment Data Model NL** can be seen as a component of the national information architecture, but one which is aligned with private sectors such as construction and building.
4. Ideally, priority would be given to the Conceptual Information Model on Environment Information in the context of the Dutch Environment and Planning Act.

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Thanks for your attention!

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