Content

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- What is Metadata
- Design and Thing
- Catalogs
- INSPIRE and digital Geo Data
- News Requirement: Pragmatics
- ...and the w-holy REST

Who we are: Me, Myself and I

We are geospatially aware since 1991

- OGC Architecture Board Member
- Current President of OSGeo
- OpenStreetMap advocate

My alter ego Seven is an Ex-Borg

Metaspatial

When? Consultation since March 2010

Why? To leverage your spatial data

What? Consultation and Implementation of
- Spatial Data Infrastructures
- Metadata

How: Open Source Software and Data
with Open Standards
and Agile management

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What is Metadata?

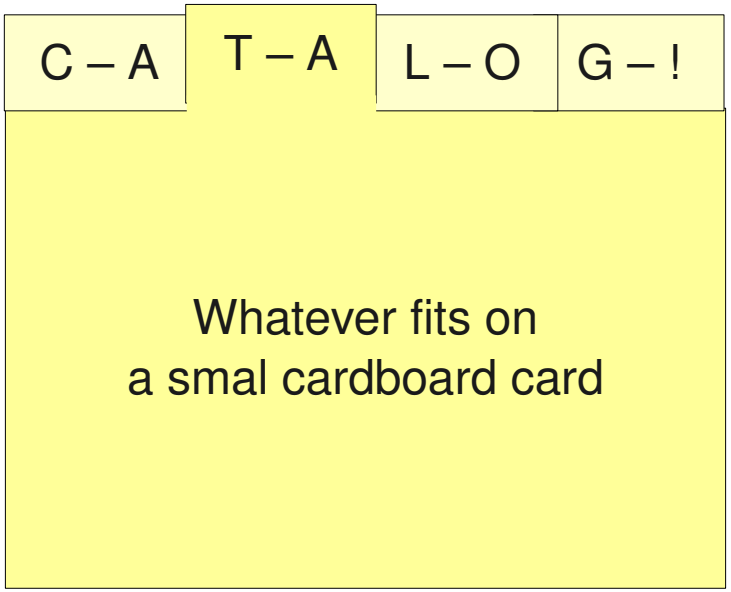
- [...]
- Metadata is data.
- However, it is impossible to identify metadata just by looking at it.
- We don't know when data is metadata or just data.

http://en.wikipedia.org/wiki/Metadata

Meta Data in Analog Catalogs...

The typical meta data of a book (the material object) can be:

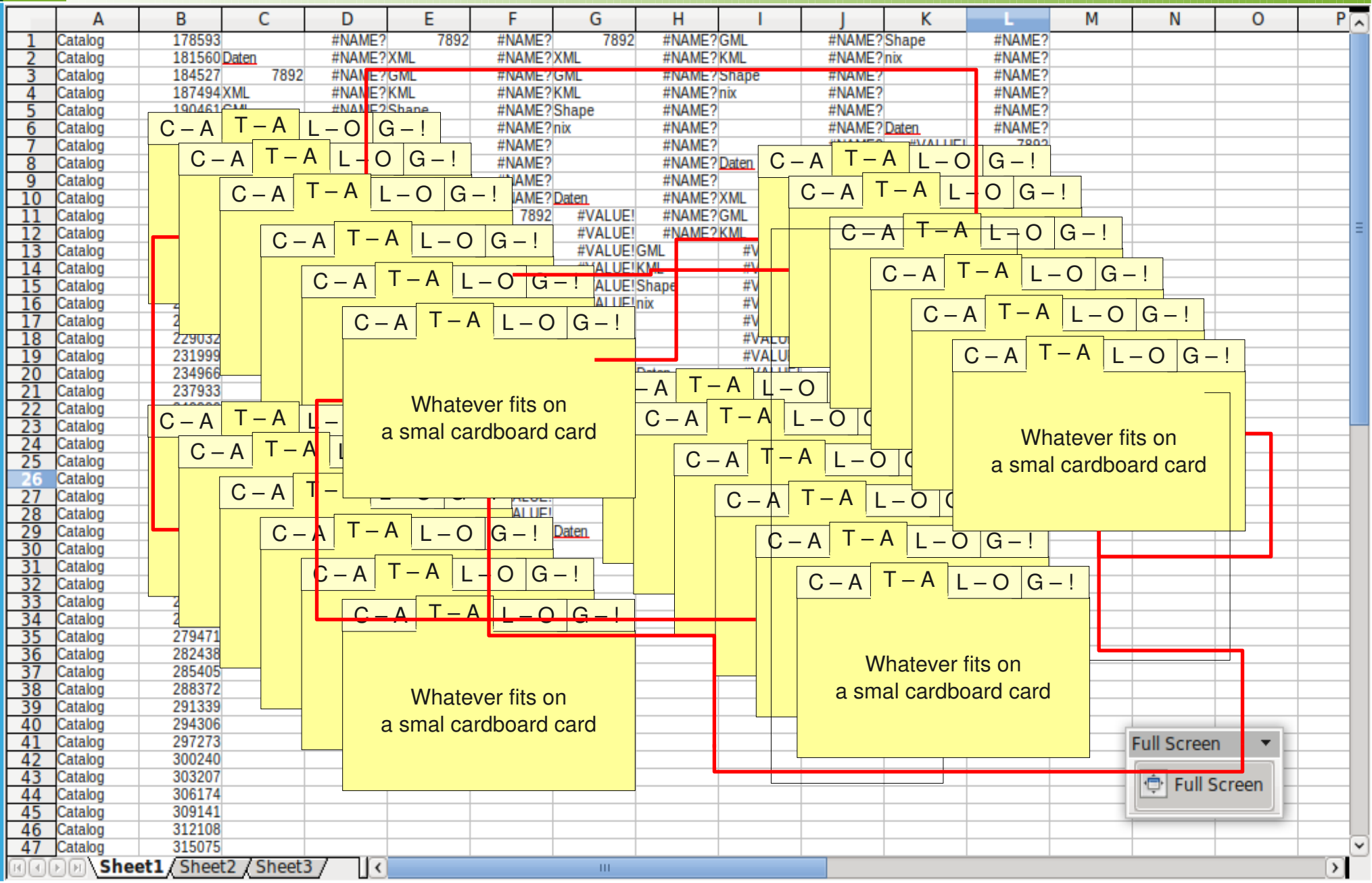
- the name of the author
- the edition
- the year of publication
- the publisher
- and the ISBN number …



Therefore

it may be natural to think that digital meta data will look like a complex catalog

>


C – A T – A L – O G – !
Whatever fits on
a smal cardboard card
Whatever fits on
a smal cardboard card
Whatever fits on
a smal cardboard card
Whatever fits on
a smal cardboard card
Full Screen
Full Screen
Sheet1 Sheet2 Sheet3

But...

digital
electronic
(Meta)–Data

...is a very different beast

Just for the fun of UTF-8
let's call this:

Metædata

what about the "e" as in electronic
or digital?

Design vs. Thing

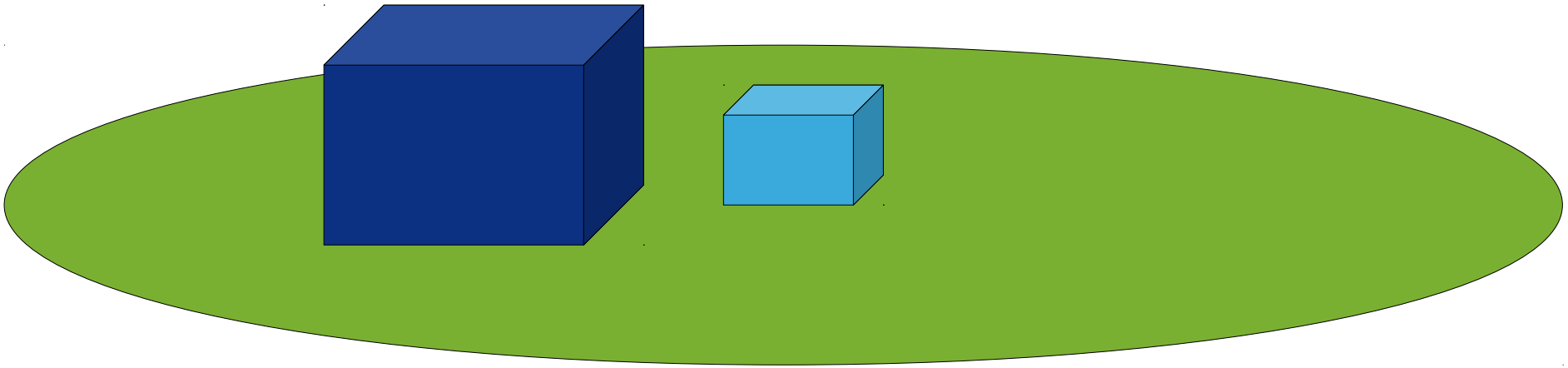
This presentation, information, any data in electronic format is nothing but design based on our concepts

The World of Things

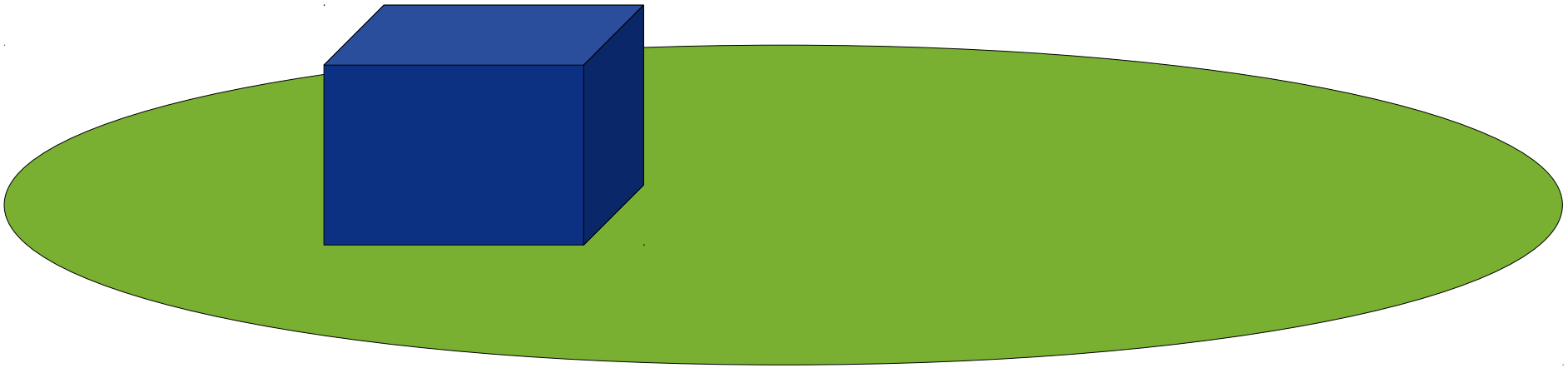
Things
take up space:

Matter is compounded of atoms and molecules and bound by gravity and ***order***

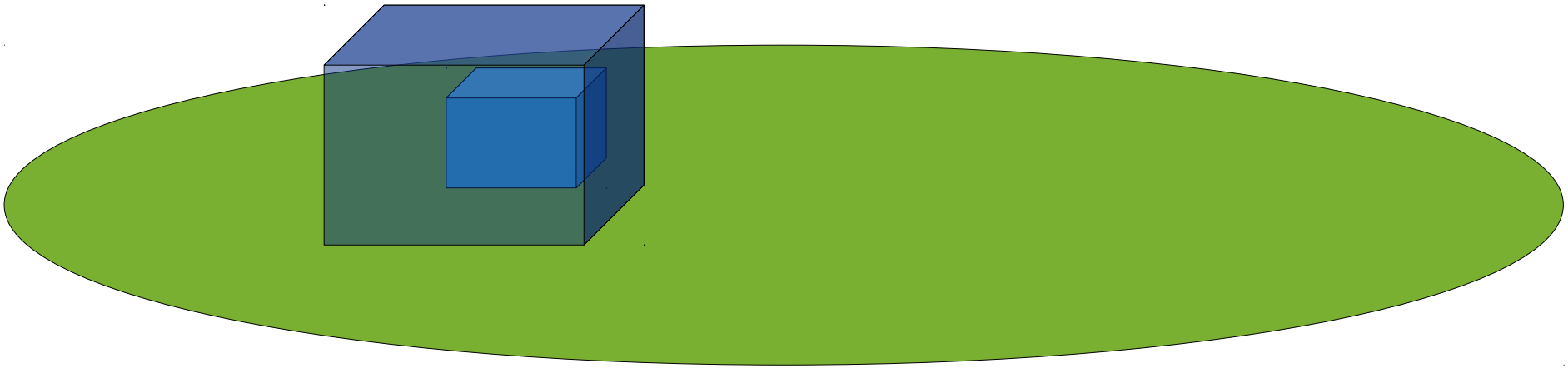
Matter (a thing) can only be in one location at one time.



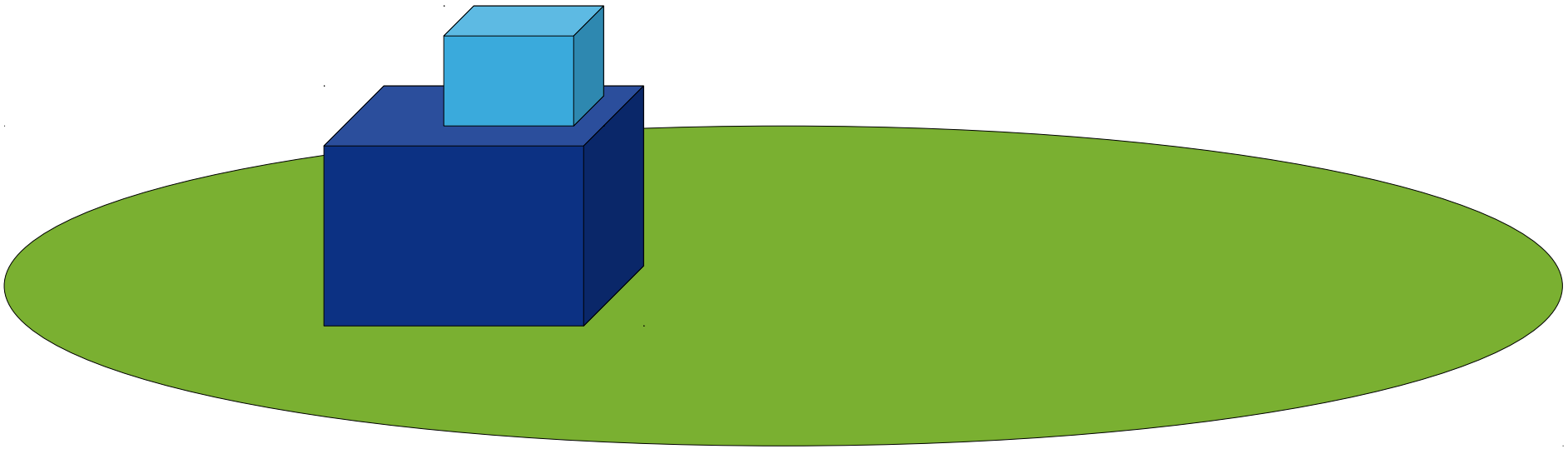
Things are always ordered and can thus hide each other.



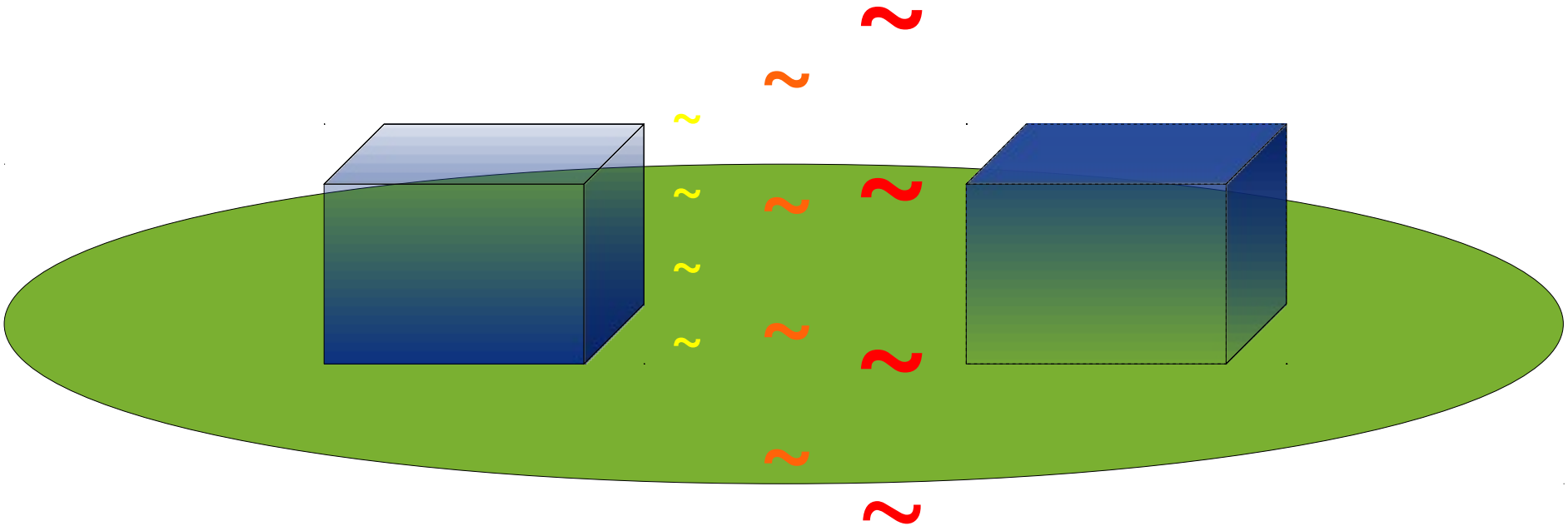
Just in case you didn't believe...



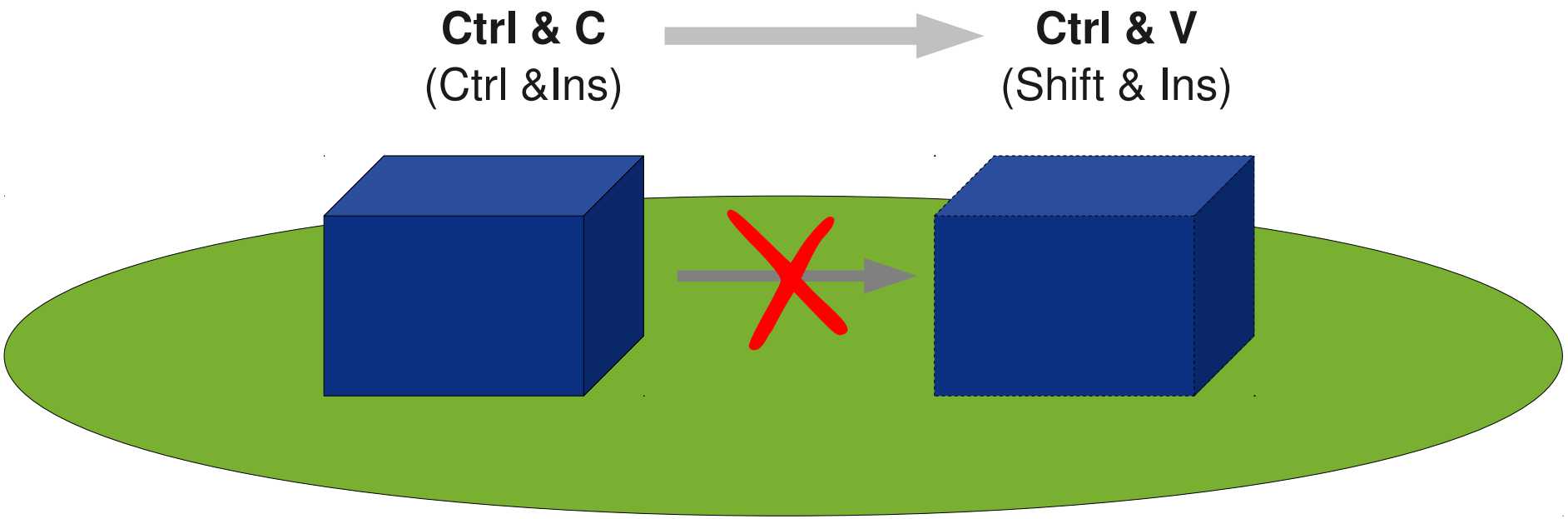
Two things cannot be at the same location at the same time.



One thing cannot be at two locations at the same time.

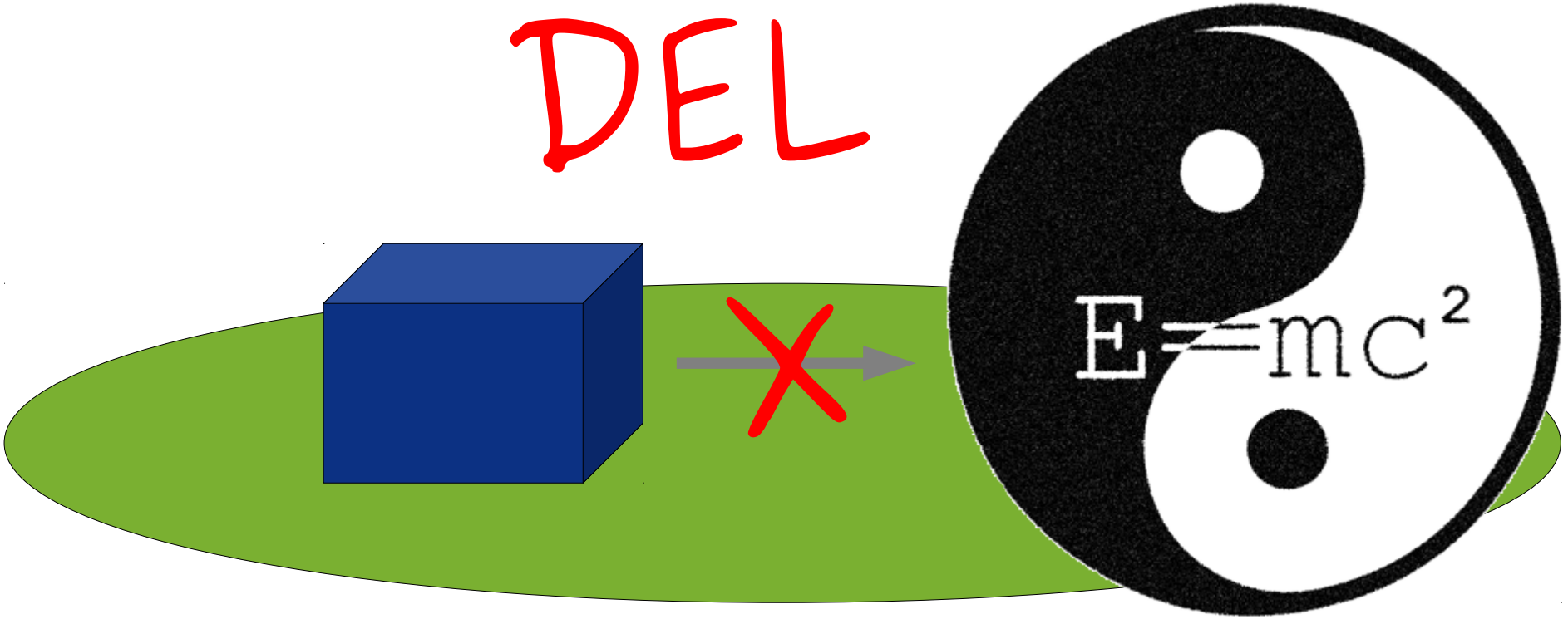


Things cannot be copied!



(The Star Trek universe is an exception to this rule)

Things cannot be deleted!



http://commons.wikimedia.org/wiki/File:E=mc2.png

Summarizing Matter

- Matter cannot exist without space.
- Matter takes up space.
- Matter can only be in one place at a time.
- Matter can not be copied.
- Matter can not be deleted.
- Matter can not be **linked**.

you know where this is leading...

Data can.

*...and Metædata is even **meant** to...*

…be copied,
*modified, **linked** and deleted.*

Excursion

Copying is not theft!

...only if audio available

Digital metædata can be at any place at any time

Metædata can be duplicated, copied, modified, deleted and **linked**!

... a bit.ly Open Source...

...digital Metadata?

Examples of computer data file metadata:

- The file name
- Access permissions
- The data of last access
- ...and so on...
- The file format (odt, shp, kml, xml, rss, rdf)!

...Geospatial Meta æ Data

can contain and **is** metædata in itself:

kml - Keyhole Markup Language (OGC)

xml - eXtensible Markup Language (W3C)

rss - Really Simple Syndication (W3C)

rdf - Resource Description Framework (W3C)

All information is linked! File extensions are Metædata, implicitly linked to specifications

INSPIREd Metadata?

"Profiles! Why, but why?"

...you can hear them complain.

The reason is simple enough, the idea is from the last millennium.

This is not to say that all old ideas are bad!

But yes, they should be allowed
to follow Life's § 1:

Evolve!

INSPIRE

The definition of "Metadata" in the INSPIRE directive is rather thin.

[…]

6. ‘metadata’ means information describing spatial data sets and spatial data services and making it possible to discover, inventory and use them;

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:108:0001:0014:EN:PDF

INSPIRE

2. Metadata shall include information on the following:

[...]

(b) conditions applying to access to, and use of, spatial data sets and services and, where applicable, corresponding fees;

[...]

(e) limitations on public access and the reasons for such limitations, in accordance with Article 13.

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:108:0001:0014:EN:PDF

End-User License Agreement

Example 1

The metadata for an orthorectified aerial photography image could contain:

- Spatial extent
- Coordinate reference system
- Projection
- Format, access options
- Date of exposure
- Resolution of original image
- Number of Bands
- Recording device
  - Digital
  - Analog
- Processing steps
  - Rectification
  - Geo referencing
  - Contrast adjustment
  - Brightness adjustment
  - etc.

Example 2

The metadata of a Traffic Information Service can consist of:

- Spatial extent
- Coordinate reference system
- Projection
- Format, access options
- Source of geometric data
- Actuality
- Acquisition method
  - Official data
  - Vounteered data
  - Forecasting method
- Consideration of construction sites, events, speedometers,
- etc.

Syntax and Semantics

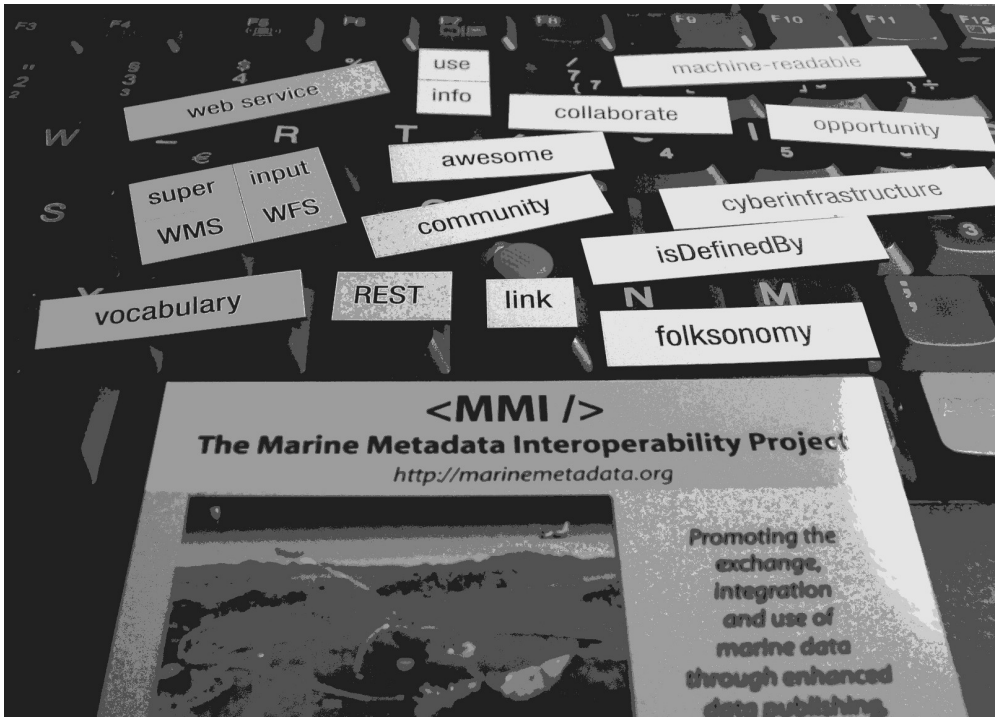
Syntax and semantics are disciplines of the science of Semiotics.

In geoinformatics **syntax** describes spatial data **formally**, whereas **semantics** describes it's **meaning**.

To be able to store this information in a catalog it has to be indexed and structured.

Ontology

Every Domain has to create their own Ontology.



Example:

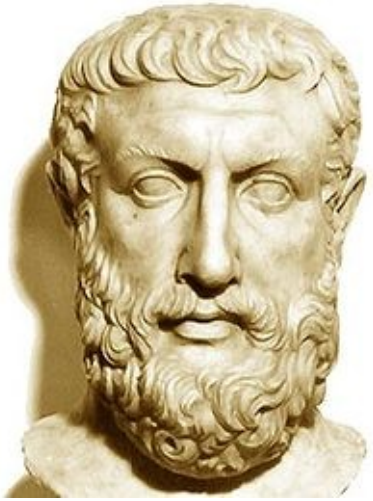
The Marine Metadata Interoperability Project

http://marinemetadata.org

Ontology

Ontology is the philosophical study of the **nature of being**, existence or reality in general, as well as the basic categories of being and their relations.

Relations



Parmenides

http://twitter.com/sevenspatial/status/19854195289

Pragmatics

In Semiotics, **Syntax** and **Semantics** are complemented by **Pragmatics.** It defines:

>>> The **relation** between signs and their effects on those who use them.

>>> People, machines?

Informatics in general and geospatial data management e-spatially lack **Pragmatics**!

The Data Provider Perspective:

- All spatial data is described by the same smallest common denominator (Dublin Core, FGDC, ISO 19115 and so on) an specific incompatible profiles.
- Metadata creation and maintenance are typically artificial extra jobs for the data creators.
- Metadata is provided through complex interfaces (Catalog Services Web) and formats (ISO 19139 and specific profiles).
- Metadata quality is mostly limited on syntax.
- There is little to no interaction with users.

The Data Consumer Perspective

- Users do not understand the "language" of the providers
- Metadata descriptions are always incomplete if not related to one or better even – many ontologies.
- The service offering is too complicated, incompatible and unreliable.
- "Geo portals" do not satisfy user's need.
- Interaction between consumers and providers is minimal.
- Metadata is not linked well enough.

Nu Req'

- Extend offer
- Simplify Search.
- Allow browsing.
- ...user evaluation.
- Supersede categories by user's tags.
- Automize creation and maintenance of metadata
- Allow and enhance interaction between users and providers

Concepts of the Web (2.0)

- Resource-oriented architecture patterns (REST and ROA) allow simple creation, maintenance and search.
- Propagation of spatial data uses GeoRSS.
- User communities must grow their own specific ontologies.
- Users and providers need to talk.
- All data belongs in open buckets!

Filter on the way out!

David Weinberger (2008):
Everything is Miscellaneous

REST – linking with sense

Four concepts:

- the resource
- the name (URL)
- the representation
- their relations(links)

Four properties:

- Addressability
- Statelessness
- Connectedness
- Well formed operations

The corresponding architecture pattern is the Resource Oriented Architecture (in short: ROA).

Now what?

Current catalog technology does not use the potential of metædata. We need "buckets".

- **Open Access to Spatial Data**

The "Internet" is the lowest common layer of any SDI. Use it as it was meant to be used:

- **REST paradigms and the ROA shall permeate standards (OGC, ISO, CEN, etc.) offerings (OS UK, CGDI, Geoportal RLP etc.) and regulations (INSPIRE)**

How about you?

If you are interested in this vision and want to join on this mission impossible, consider joining the OSGeo Public Geospatial Data Committee and Mailing List.

We can build a bucket for **your** metædata and **your** use case.

Interested?

Thank you for your attention!

The international
Open Source Conference for the
Geospatial Domain
http://2010.foss4g.org

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