

IKT og Videnrepræsentationer - ICT and Knowledge Representations.

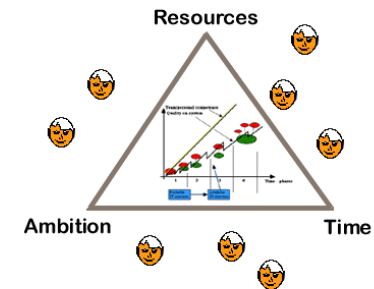
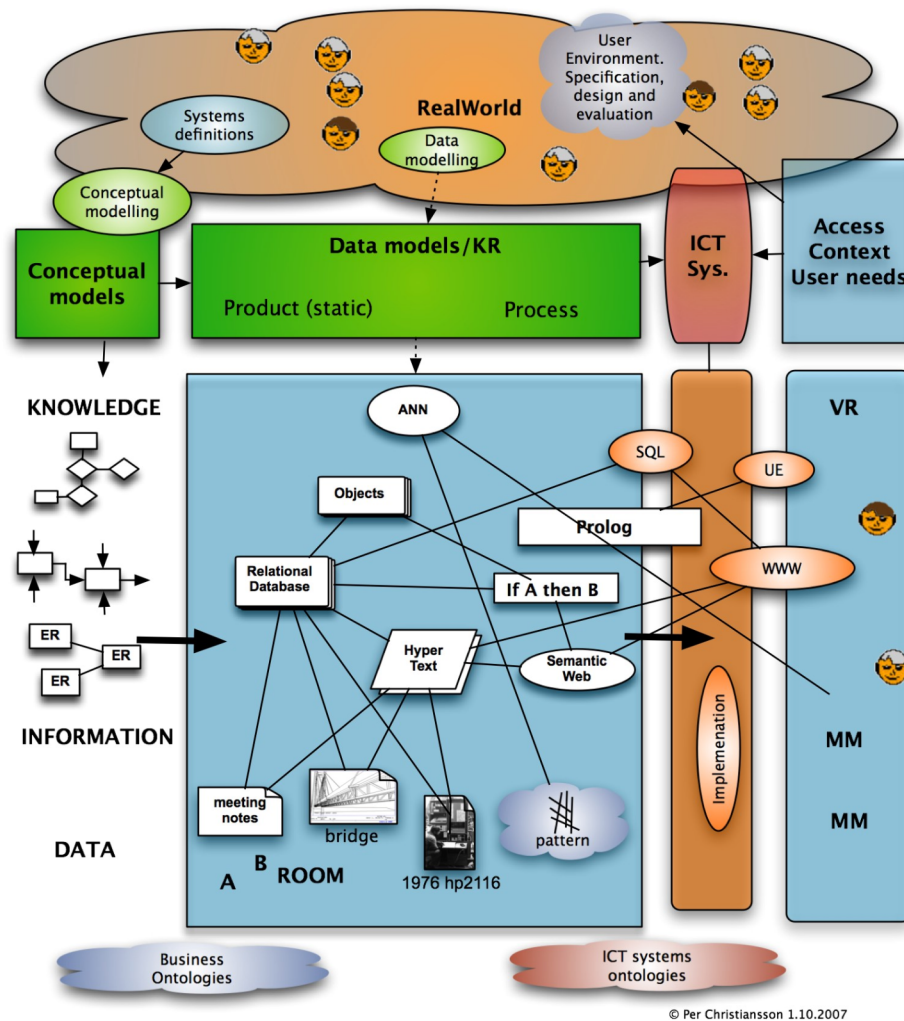
7. Semantic Web

Cand. Scient. Bygningsinformatik.
Semester 2, 2010.

CONTENT

- XML
- XSD, XSLT,
- Semantic Web, RDF RDFS

SYSTEM DEVELOPMENT



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Always achieve a good balance between Time, Ambition and Resources.

From the real world to implemented systems in use

What is XML?

From <http://www.w3.org/standards/xml/core>

What is XML?

The Extensible Markup Language (XML) is a simple text-based format for representing structured information: documents, data, configuration, books, transactions, invoices, and much more. It was derived from an older standard format called SGML (ISO 8879), in order to be more suitable for Web use.

What is XML Used For?

XML is one of the most widely-used formats for sharing structured information today: between programs, between people, between computers and people, both locally and across networks.

Main differences from HTML

- all elements must be closed
- attribute values must always be quoted
- no inbuilt names (tags)

XML is simple to read and self-describing

Example:

```
<Project>
<ProjectName>Semester 7, 2001</ProjectName>
<Site>
  <SiteName>Harbour dwelling area, Aalborg</SiteName>
  <Building>
    <BuildingId>Building 1</BuildingId>
    <Storey>
      <StoreyLevel>level 3</StoreyLevel>
      <Space SpaceType="room" SpaceFloorArea="38">
        <usage>living room</usage>
      </Space>
      <Space SpaceType="kitchen" SpaceFloorArea="25">
        <usage>open kitchen</usage>
      </Space>
    </Storey>
  </Building>
</Site>
</Project>
```

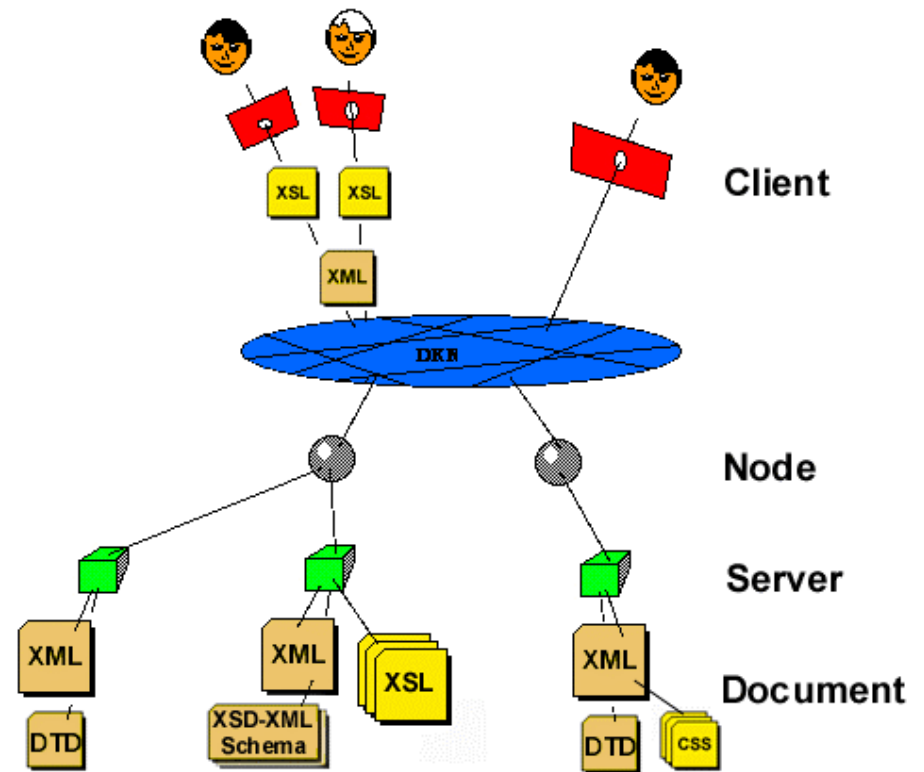
XML INTRO

XML, Extensible Markup Language, is a simplified subset of SGML, Standard Generalized Markup Language. XML coded files are extensively used to transport information between applications on the Internet.

• http://it.civil.aau.dk/it/education/slides/xml_introduction_tot.html

See the project.xml example at

• http://it.civil.aau.dk/it/education/slides/xml_introduction.html



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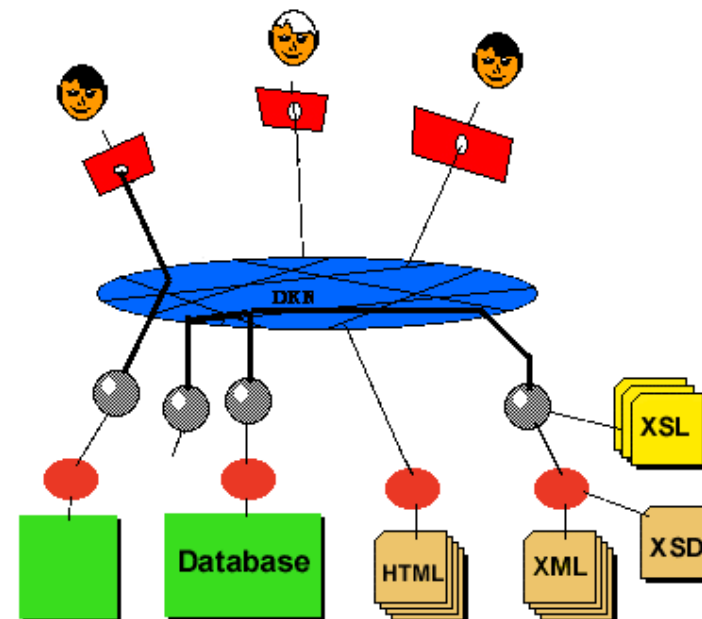
SEPARATION OF CONTENT AND ACCESS

Applications and information containers can communicate using XML formatted information. The specification of the container data is expressed in (XML coded) **XSD** schema files (schema files).

The validity of exchanged information can be checked via the schema files and even translated between applications by **XSL** transformation files.

We thus here have a efficient way to support interoperability between applications.

In the early system prototyping phases we often start by making simple information containers using HTML, XML and XSL files during user needs and requirements capture.



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XML, XSD, XSLT

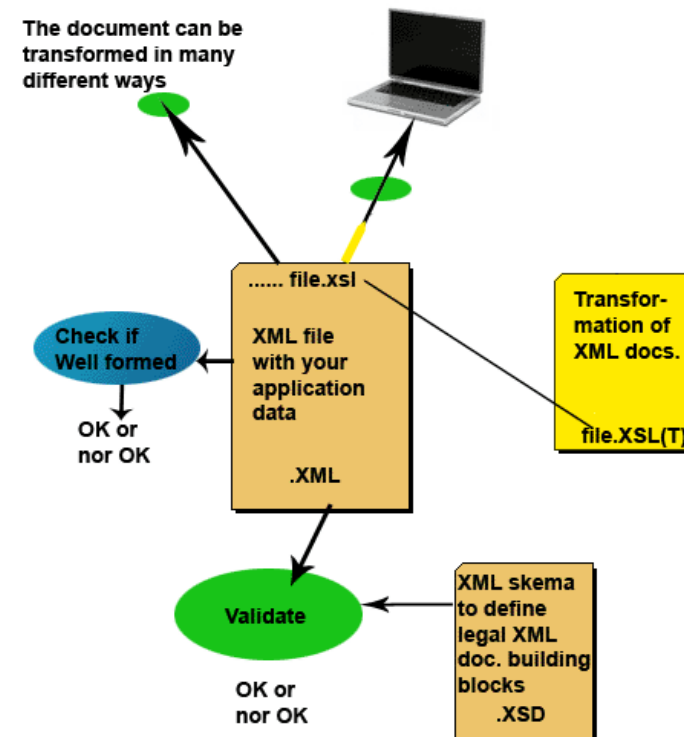
Further clarification of the relation between XML file containing application data and model, skema file, and transformation file.

Example on **validation** tool is XMLSpy from <http://www.altova.com>.

Most XML editors can check if a XML document is **well formed**. (<http://www.exchangerxml.com/>,...)

XML schema: <http://www.w3schools.com/schema/>

XSL Transformations: <http://www.w3schools.com/xsl/>



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SEMANTIC WEB

In addition to the classic “Web of documents” W3C is helping to build a technology stack to support a “Web of data,” the sort of data you find in databases. The ultimate goal of the Web of data is to enable computers to do more useful work and to develop systems that can support trusted interactions over the network. The term “Semantic Web” refers to W3C’s vision of the Web of linked data. Semantic Web technologies enable people to create data stores on the Web, build vocabularies, and write rules for handling data.

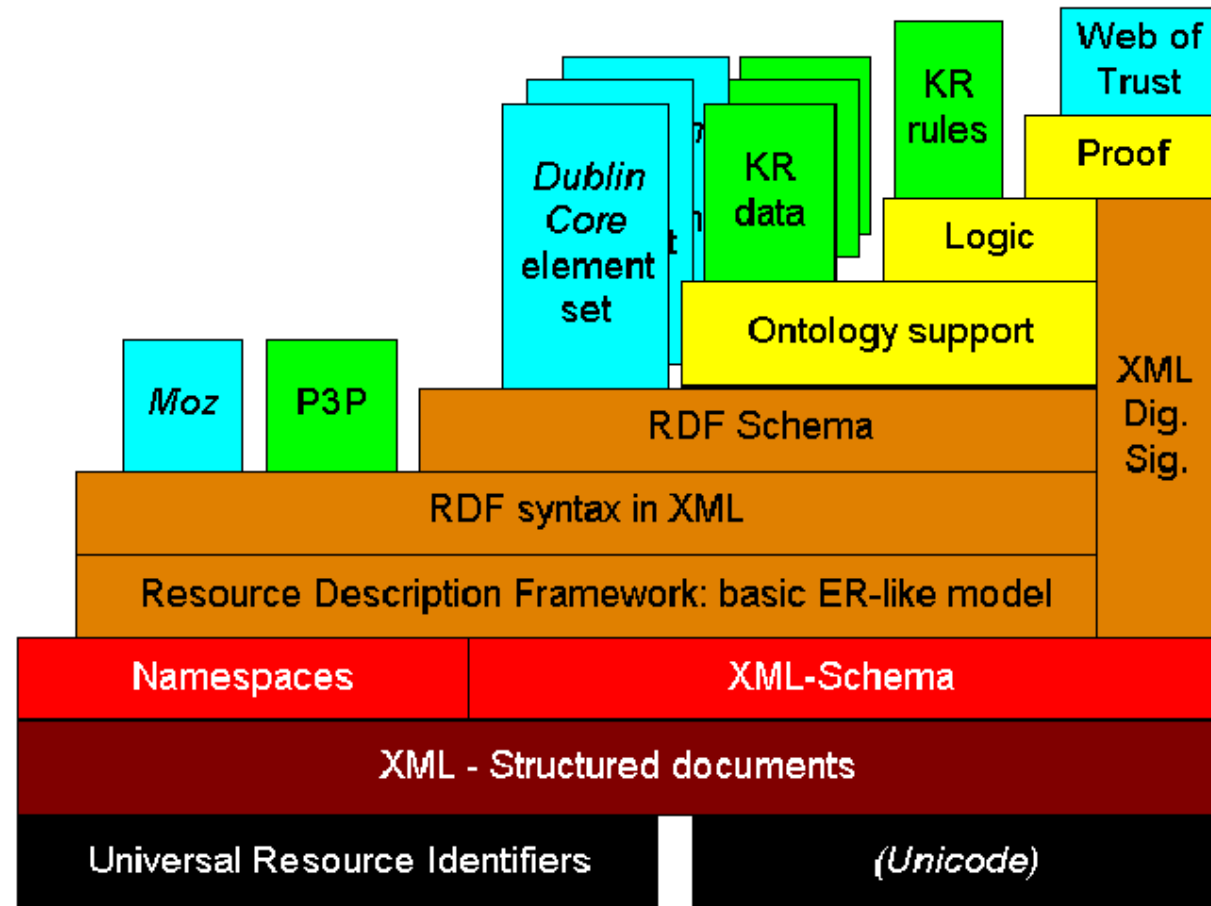
<http://www.w3.org/standards/semanticweb/>

SEMANTIC WEB

"The Semantic Web is an extension of the current web in which information is given well-defined meaning, better enabling computers and people to work in cooperation."

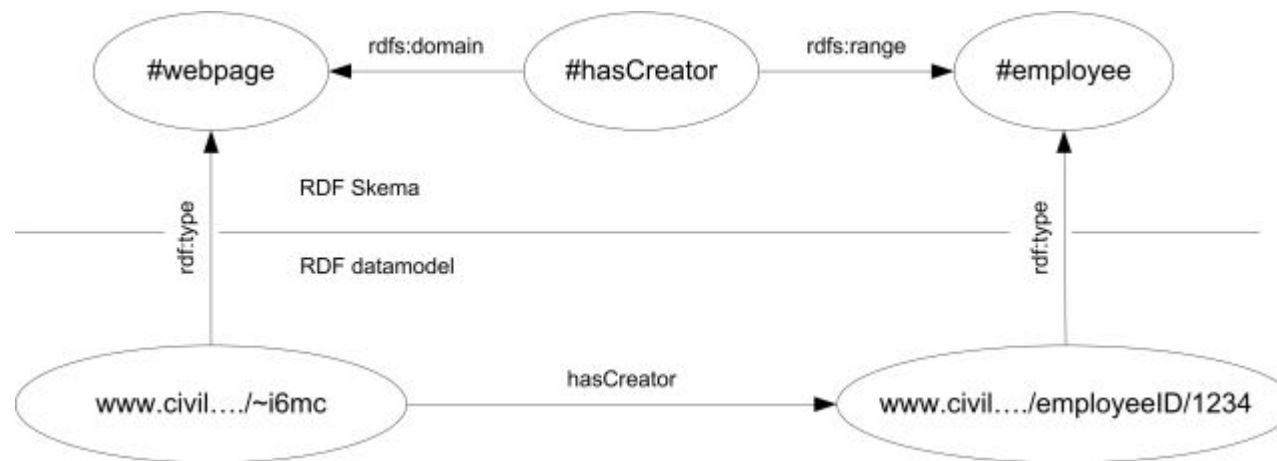
-- Tim Berners-Lee, James Hendler, Ora Lassila, The Semantic Web, Scientific American, May 2001

Berners-Lee T, Hendler J, Lassila O, 2001, "The Semantic Web. A new form of Web content that is meaningful to computers will unleash a revolution of new possibilities". Scientific American, May 2001. http://www-personal.si.umich.edu/~rfrost/courses/SI110/readings/In_Out_and_Beyond/Semantic_Web.pdf



Tim Berners Lee, <http://www.w3.org/2000/Talks/1206-xml2k-tbl/slide10-0.html>

SEMANTIC WEB CONTENT



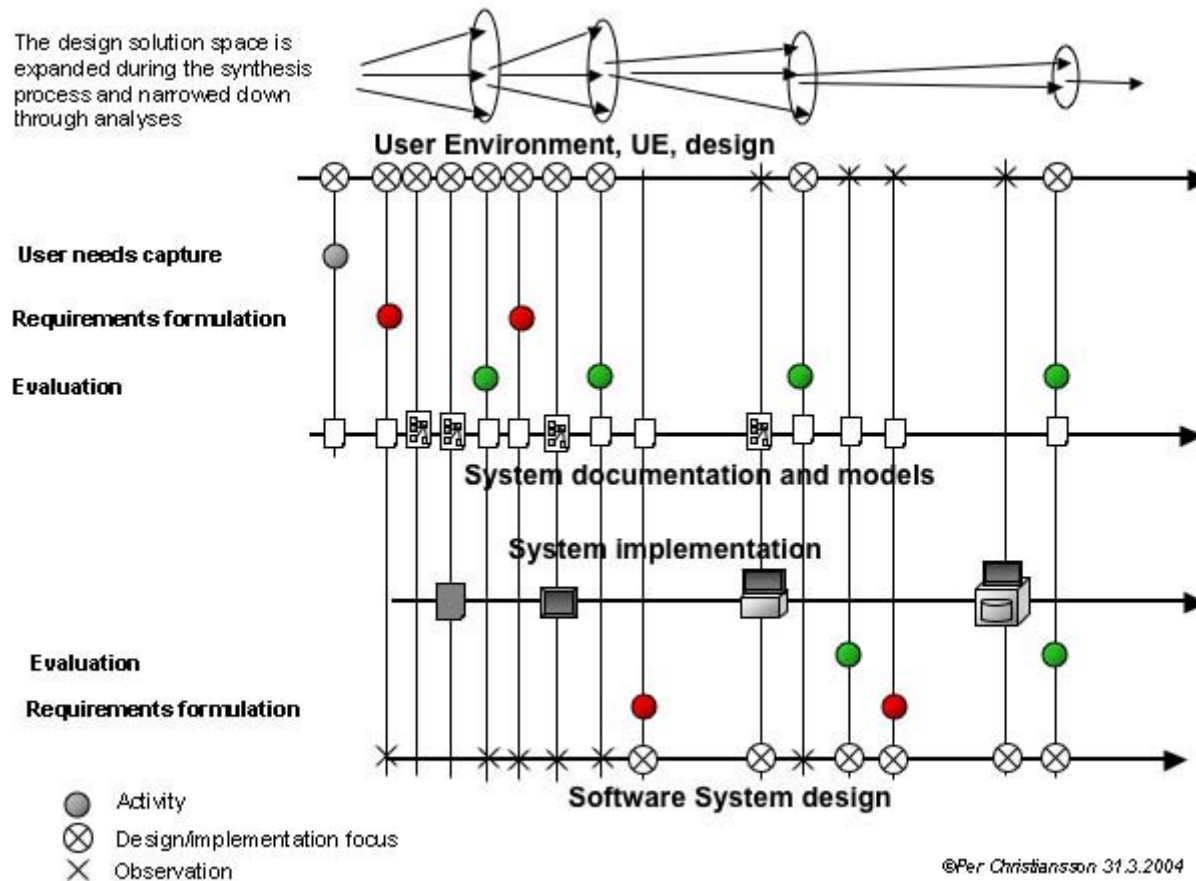
Semantic Web Data and Ontologies.

- http://it.civil.aau.dk/it/education/slides/semantic_web_metadata_ontology.html

END

<http://it.civil.aau.dk>

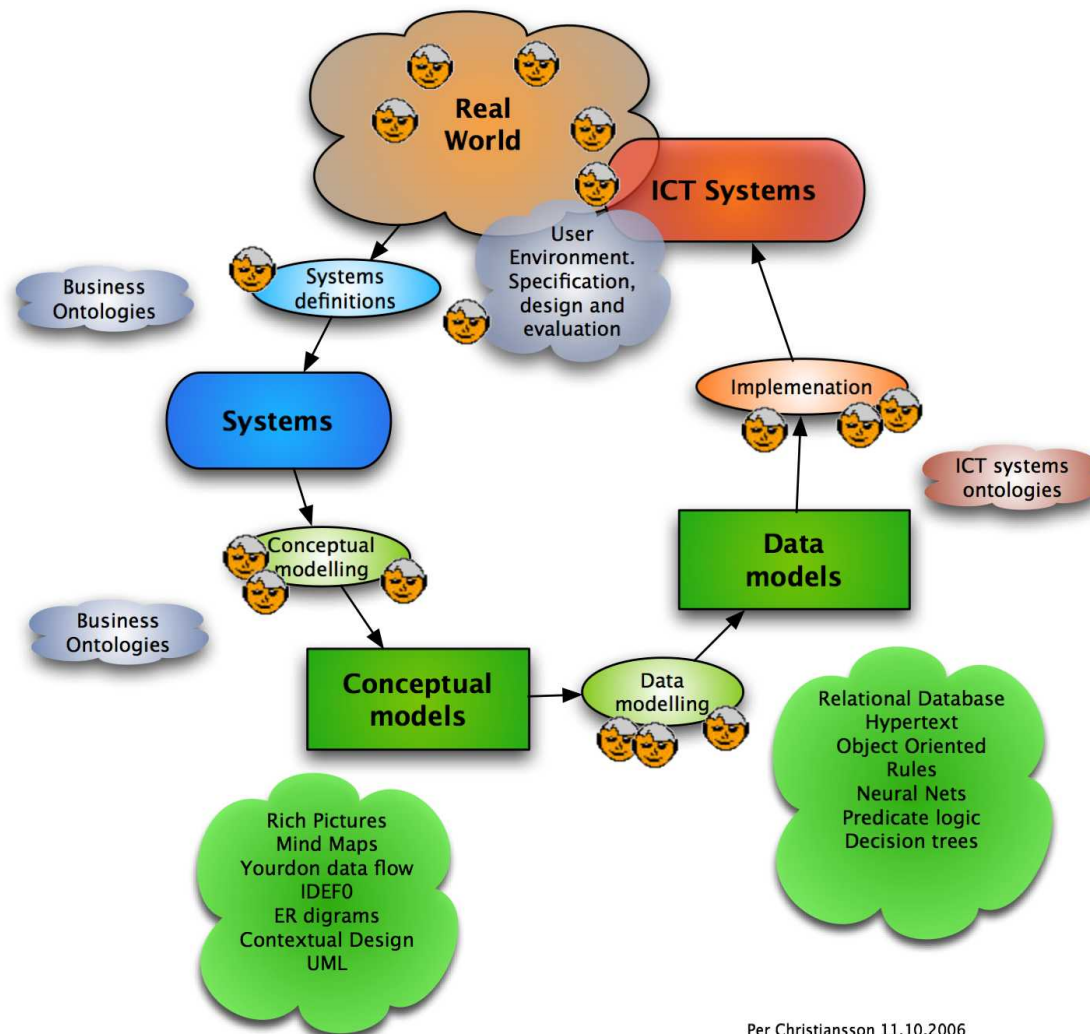
MODELS OF THE REAL WORLD



The early design process focuses on user environment, UE, design/implementation and the later phases on software development and implementation.

The UE design including user needs capture and user requirements formulations can be supported by contextual design methodology. Different evaluation paradigms can be used as design/implementation progresses.

SYSTEM DEVELOPMENT



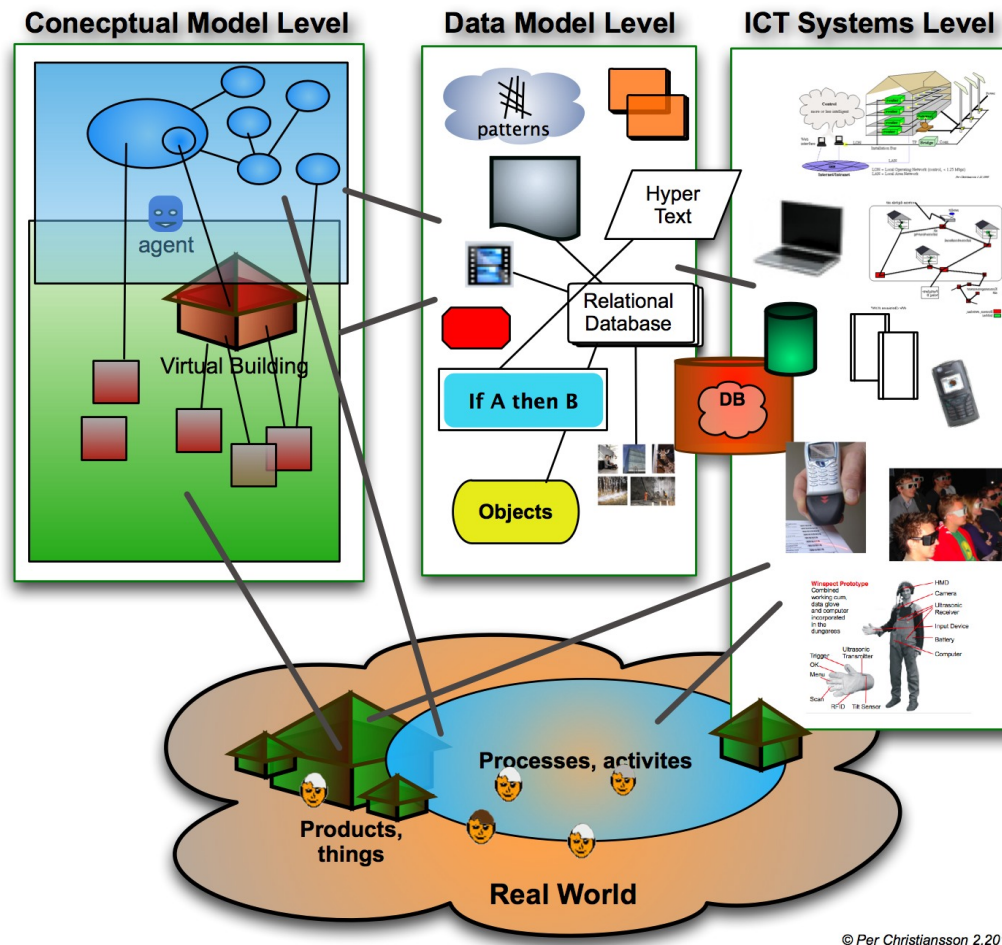
Per Christiansson 11.10.2006

In the real world we identify activities, things, processes, context, and persons.

The real world can be described as (interrelated) systems (no de-facto structure is available today) to accomplish different functions e.g. a comfort system to provide personal living and working quality, personal transport system, load carrying building system, escape system, and communication systems (collaboration, knowledge transfer, mediation, virtual meeting).

MODELS OF THE REAL WORLD

The Real World, Models and Systems



The **HOLISTIC** view
The holistic view.

We use different kinds of ICT support in the building process and the built environment.

The ICT systems support different functionalities in the building process and built environment.