



Diffuse: Tracking Standards Development for the Information Society

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The Diffuse Project



Structure of presentation

- ❑ The Diffuse Project -- aims and objectives
 - ◆ What Diffuse offers relating to Web Services and the Semantic Web
- ❑ ISO 13250 Topic Maps and the Semantic Web
- ❑ What's missing for Business Semantics
- ❑ Multilingual Upper-Level E-Commerce Ontology
- ❑ Where to go for more information

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Background

❑ Open Information Interchange (OII) initiative under INFO2000 (1994-2000)

- ◆ Grew from <100 standards to over 2000 in 20 sections
- ◆ Printed list distributed to mailing list
- ◆ Web site started in 1995

❑ IST Diffuse Project (2000-2002)

- ◆ Over 3000 standards referenced in 30 sections
- ◆ 30 Business Guides
- ◆ Over 320 IST RTD projects using/developing standards
- ◆ Monthly/quarterly reports on standards and RTD project developments
- ◆ Over 4000 users from up to 100 countries each week
- ◆ Japanese version of Diffuse.org maintained by Japanese Standards Association

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IST Action Lines

❑ Key Action Line I: Systems and Services for the Citizen

❑ Key Action Line II: New Methods of Work and Electronic Commerce

❑ Key Action Line III: Multimedia Content and Tools

❑ Key Action Line IV: Essential Technologies and Infrastructure

❑ Cross Programme Themes and Future and Emerging Technologies

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The Diffuse Team

- ❑ **Project Manager**
 - ◆ Aatto J. Repo, TIEKE (Finnish Information Society Development Centre)
- ❑ **Editorial Manger**
 - ◆ Man-Sze Li, IC Focus (UK)
- ❑ **Technical Manager**
 - ◆ Martin Bryan, The SGML Centre (UK)
- ❑ **RTD Projects Rapporteur**
 - ◆ Marja-Leena Vespäläinen, TIEKE (Finland)

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Who is Diffuse used by?

- ❑ RTD project teams looking for relevant standards
- ❑ Business managers looking for guidance on how best to apply standards within their organization
- ❑ Members of standards organizations needing to track what is going on elsewhere
- ❑ Public administrators needing to determine how best to direct policies

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□ Reference Material

- ◆ Business Guides
- ◆ Standards List
- ◆ Standards Fora List
- ◆ RTD Project Lists

□ News

- ◆ Electronic Commerce Interoperability
- ◆ Information Management Standardization
- ◆ IST RTD Standards Impact
- ◆ Standards Conferences

□ User Support

- ◆ Index and Searching
- ◆ Help Desk

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□ Provide high-level, business-oriented, overviews of sets of related standards

□ Cover specific business issues:

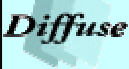
- ◆ Electronic Payment
- ◆ Open Source Licensing
- ◆ Knowledge Management
- ◆ Web Services

□ Or specific technical issues

- ◆ XML and related standards
- ◆ Semantic Web
- ◆ Internationalization/Localization

□ 30 Guides published to date

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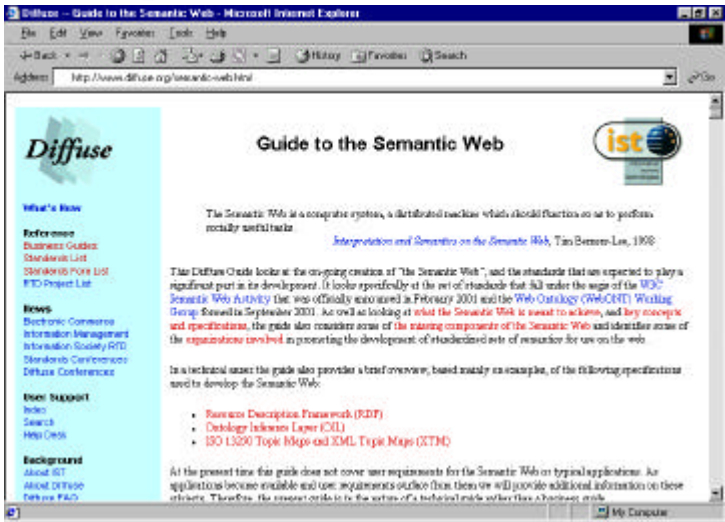
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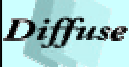
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Example Business Guide



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Diffuse Standards List

- ☐ Provides a single source for information about standards generated by a wide range of standards fora
- ☐ Summarizes objectives of each standard and identifies uses to which it is put
- ☐ Where possible provides link to on-line sources of data (over 10,000 external links)
- ☐ Identifies IST RTD projects that have helped in the development of the standard, or are evaluating its use

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Standard categories

APPLICATION SPECIFIC

Electronic Commerce

- Architectures
- Business semantics
- Electronic data interchange (EDI)
- Information security
- Payment
- Product data

Sectorial Data Interchange

- Geographic information
- Medical informatics
- Museum information
- Scientific information

See also Business Guide to subject
+ Entries updated this month

GENERAL PURPOSE

Information Management

- Data classification
- Metadata interchange
- Directories
- Archiving
- Library information

Data Representation

- Character sets
- Text-based documents
- Multimedia/hypermedia
- Audio
- Video
- Raster graphics
- Vector graphics
- Colour information

Communications

- File transfer
- Electronic mail and newsgroups
- Electronic conferencing
- Mobile data communication
- Webcasting
- Digital television
- Application program interfaces

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- ❑ Summarizes the objectives of standards body and stable industry consortia
- ❑ Provides details of the main areas of activity within each standards forum
 - ◆ For bodies with many technical committees, links are provided to each relevant committee
- ❑ Summarizes the membership criteria
- ❑ Provides a contact address and a URL to the relevant web site

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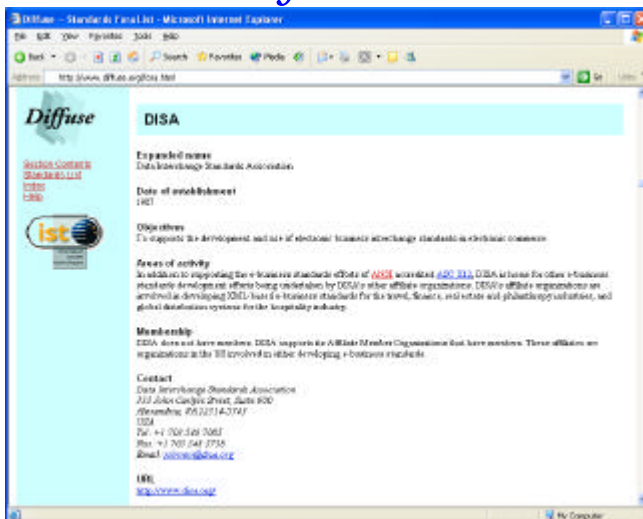
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Types of fora

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Formal Standards Body

- ◆ CIE, ISO, IEC, ITU, UN/CEFACT
- ◆ CEN, CENELEC, ETSI, EBU

Partnerships

- ◆ ISO/IEC JTC1, EESSI, E-Business MoU, ICTSB

Consortia

- ◆ Web: W3C, IETF, OASIS
- ◆ Industrial: DVB, ECBS, EEMA, HL7, SWIFT

Professional

- ◆ IEEE, ICOM, IFIP

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Identifies relationship between IT standards and IST RTD projects

Summarizes details of projects

- ◆ Name and acronym
- ◆ Participants
- ◆ Contacts
- ◆ Website URL

Summarizes project objectives

Explains links to relevant standardization initiatives and referenced standards

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What we say about RTD projects

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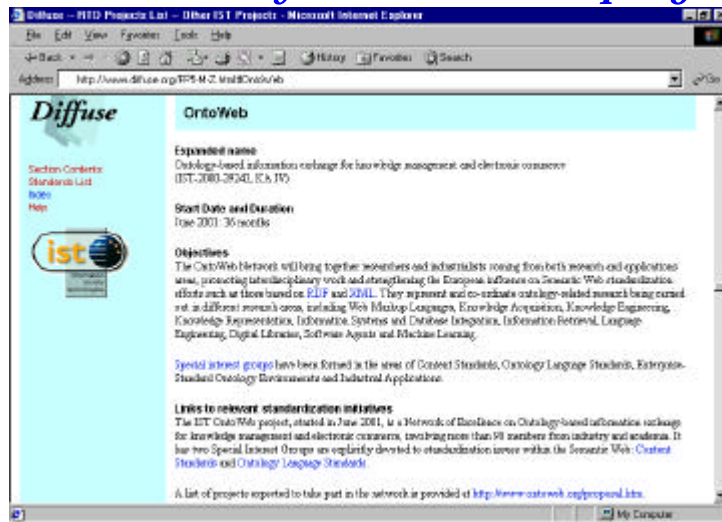
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Keeping you up-to-date

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- ❑ Monthly mailing to user community summarizing what is new on the site
- ❑ Monthly report of standards used for electronic commerce (KAI activities)
- ❑ Monthly report on standards impacting electronic content management (KAII activities)
- ❑ Quarterly reports on impact of standards within IST RTD projects
- ❑ Reports on what happens at key European conferences related to IT standardization

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- ❑ 1st Diffuse Conference, 7th March 2001
Convergence to Consolidation: What's Next in the Information Market?
- ❑ 2nd Diffuse Conference, 6th February 2002
Will Web Services Revolutionize e-Commerce?
- ❑ Final Diffuse Conference, 12th December 2002
Convergence of Web Services, Grid Services and the Semantic Web for delivering e-Services?
Will also look at the role of Open Source Licensing for the distribution of Web Services

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- ❑ Diffuse Guide to the Web Services
 - ◆ Web Services: What are they?
 - ◆ Web Services "standards" and their implementation
 - ◆ What next?
 - ◆ Emerging Web Services specifications
 - ◆ Overview of Grid Services
- ❑ Diffuse Conferences
- ❑ Reports from Standards Conferences
 - ◆ Global Grid Forum 5
 - ◆ First International Semantic Web Conference
- ❑ RTD Projects

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From W3C

- ◆ Web Services Description Language (WSDL)
- ◆ Web Services Conversation Language (WSCL)
- ◆ Web Services Description Requirements
- ◆ Simple Object Access Protocol (SOAP)

Other proposed specifications

- ◆ Universal Description, Discovery and Integration (UDDI)
- ◆ LDAP Schema for UDDI
- ◆ Web Services for Interactive Applications (WSIA)
- ◆ Web Services for Remote Portals (WSRP)
- ◆ Business Process Execution Language for Web Services (BPE4WS)

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Diffuse Guide to the Semantic Web

Information Management Standards

- ◆ Data classification
- ◆ Metadata interchange
- ◆ Directories
- ◆ Archiving
- ◆ Library information

Reports from Standards Conferences

- ◆ First International Semantic Web Conference
- ◆ OntoWeb project meetings
- ◆ IST Semantic Web Technologies Workshop

RTD Projects

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From W3C

- ◆ RDF and RDF Vocabulary (RDFS)
- ◆ OWL Ontology Web Language
- ◆ XLink and HLink

From ISO

- ◆ ISO 13250 Topic Maps
- ◆ ISO 15938 Multimedia Content Description Interface (MPEG-7)
- ◆ ISO 21000 Multimedia Framework (MPEG-21)
- ◆ ISO 11179 Specification and Standardization of Data Elements

and DARPA Agent Markup Language (DAML)

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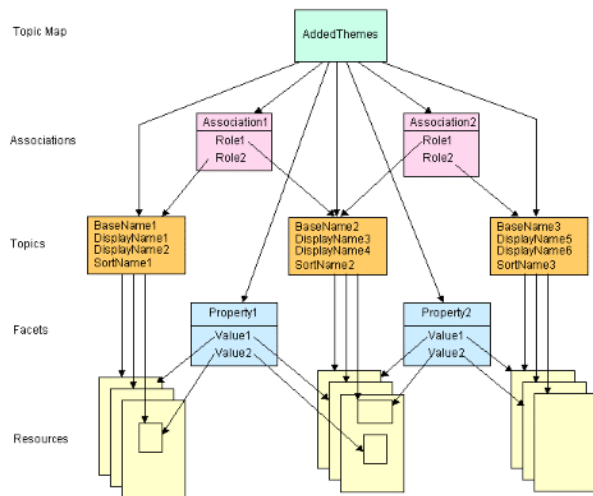


- Based on subject, predicate and object triples
- Relies on matching URLs and strings to identify relationships between triples
- Can be extended using RDF Vocabularies (RDF schemas): but how consistent are these?
- OIL extends RDF to allow some of the techniques developed for Description Logics to be used to reason with the semantics
 - ◆ Not everyone is convinced that DL is the best way to go

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What are Topic Maps?



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What do Topic Maps tell us

- ❑ Topics can have multiple names
 - ◆ Different languages and different communities use different names to identify subjects
 - ◆ The same name may occur in more than one topic
- ❑ References to topics have roles
- ❑ Associations can have more than two ends
 - ◆ Each end plays a specific role
- ❑ You need to be able to merge Topic Maps generated by different communities
 - ◆ You cannot guarantee the use of a specific name by just one community

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How Diffuse uses Topic Maps

- ❑ As an extension to the alphabetical index
- ❑ As an extension to the list of Other references to monthly reports for complex subjects such as XML and RDF
- ❑ As a way of identifying RTD projects using a standard when it is widely adopted
- ❑ Using an XML schema based on stereotypes that map directly to ISO 13250
- ❑ Using XSLT to convert the XML files to HTML for display on a browser

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Example of Diffuse Topic Map

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Topic Map for RDF: Resource Description Framework

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Acronyms: RDF

Full Name: Resource Description Framework
Click here to view the Diffuse Standards and Specifications List entry on this standard.
More detailed information on RDF can be found in [An Introduction to the Resource Description Framework](#).
Click here to view the main information source on RDF maintained by the [World Wide Web Consortium \(W3C\)](#) website.

Linked standards referenced by RDF include:
XML: The Extensible Markup Language

RDF forms the basis for the following standards in the Diffuse list:
[Publishing Requirements for Industry Standard Metadata \(PRISM\)](#)
[RDF Vocabulary Description Language 1.0: RDFS Schema](#)

RDF provides part of the following standards in the Diffuse list:
[Geography Markup Language](#)
[HTTP Distribution and Registration Protocol](#)
[Ontology Inference Layer \(OIL\)](#)
[Platform for Internet Content Selection](#)

More items about RDF can be found in:
[Information Management Standardization Strategy, March 2000](#)
• A collection of [TRINet](#) standards to [Public Ledger](#)

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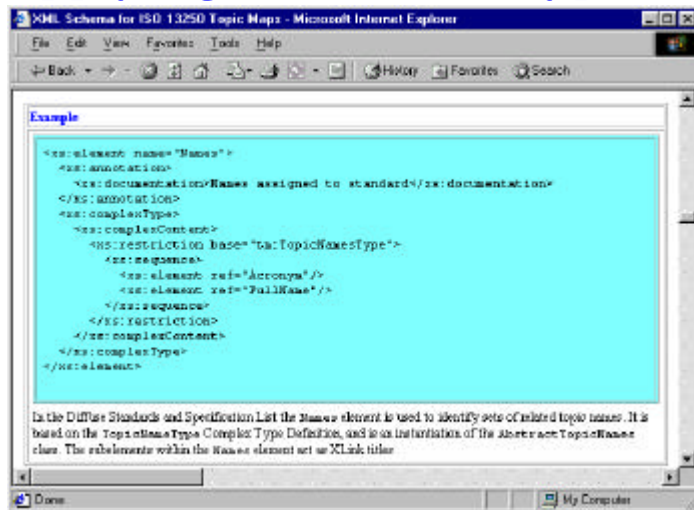
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- ❑ Subset of ISO 13250 designed to make it simple for topic map analyzers to exchange data
- ❑ Does not include facets, or handle alternative names
- ❑ Includes Public Subject Indicators (PSIs) that simplify the merging of topics

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```

UNSPSC-TM.tml - Notepad
File Edit Search Help
<?xml id="entry.10.10.15.00">
  <subjectIdentity>
    <subjectIndicatorDef xlink:href="#urn:unspsc:10.10.15.00"/>
  </subjectIdentity>
  <instanceOf>
    <topicDef xlink:href="#class"/>
  </instanceOf>
  <baseName>
    <baseNameString>livestock</baseNameString>
  </baseName></topic>
  <association>
    <instanceOf>
      <topicDef xlink:href="#assoc-family-class"/>
    </instanceOf>
    <member>
      <roleSpec>
        <topicDef xlink:href="#family"/>
      </roleSpec>
      <topicDef xlink:href="#entry.10.10.00.00"/>
    </member>
    <member>
      <roleSpec>
        <topicDef xlink:href="#class"/>
      </roleSpec>
      <topicDef xlink:href="#entry.10.10.16.00"/>
    </member>
  </association>
</?xml>

```

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What's missing?

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☐ Multilingual semantics

- ◆ Multiple meanings for same string within and between languages
- ◆ Significant overlaps between multilingual terms

☐ Accurate specification of meaning

- ◆ URL fragment identifiers based on Xquery
- ◆ Scoping of meanings
- ◆ Role definition

☐ Semantic Web navigation

☐ Semantics for business processes

☐ Workflow and fallback for integrated services

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Thesuari (ISO 2788/5964)

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❑ Hierarchical relations

Thesauri are hierarchies with broader/narrower relations structuring the hierarchy.

❑ Associative relations

UF, USE and RT. UF is a synonym term with its reciprocal USE, which are used to show that one and only one of a set of terms with equivalent meaning is preferred by the categorisation system and is used for indexing.

❑ All thesauri

Acronym

Multilingual thesauri

❑ Top Term

TT

Exact Equivalent

❑ Broader Term

BT

Inexact Equivalent

❑ Narrower Term

NT

Partial Equivalent

❑ Related Term

RT

One to Many Equivalent

❑ Used For

UF

Language of

❑ Use

❑ Scope Note

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Degrees of Equivalence

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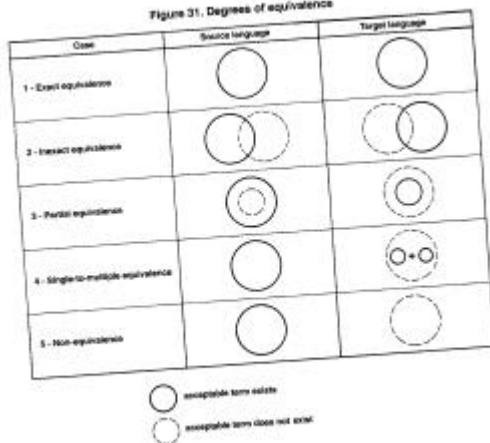
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Figure 31. Degrees of equivalence



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Problems with thesauri

- According to Professor Michael Wilson:
 - ◆ The confusion of type and part-of relations is a classic knowledge representation error - epistemological error (Brachman, 1983)
 - ◆ The confounding of objects and properties is a problem overcome by ontologies by definition (e.g. Apple, and Red do not have the same status as objects/sorts/types/classes, Guarino, 1993)
 - ◆ Ontologies that can be reasoned over by a description logic (DL - a decidable subset of FOL) also offer the ability to check the consistency of the ontology and to infer the existence of objects automatically
- For further details visit
http://www.w3c.rl.ac.uk/pasttalks/slidemaker/XML_UK_SW_Thes/Overview.html

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ISO 12620 Data Categories

- ISO 12620:1999 *Computer application in terminology -- Data Categories*
- Term
 - ◆ Term Type (main entry, synonym, quasi-synonym, common name, full form, abbreviation)
 - ◆ Grammar (part of speech, number, gender, noun class)
 - ◆ Usage, Provenance, Pronunciation, Hyphenation
- Equivalence (degree of, directionality, reliability)
- Subject (classification system and number)
- Plus wide range of Administrative Data Categories
 - ◆ Entry identifier, cross-reference, antonym, search term, language symbol, foreign text, collating sequence

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MULECO findings (1)

1. The ability to uniquely identify the domain (e.g. industry sector) in which each term is employed
2. The ability to formally record the meaning of the term within a particular domain
3. The ability to identify other domains in which the same meaning applies
4. The ability to record alternative terms that have the same meaning within the original domain
5. The ability to identify alternative terms used for the same meaning in other domains
6. The ability to identify an exactly equivalent term used in a different language

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MULECO findings (2)

7. The ability to identify a nearly equivalent term used in a different language
8. The ability to identify terms that form a part of an object defined by a term
9. The ability to identify wholes that a term forms a part of
10. The ability to identify an opposite term or property (e.g. water-resistant/water-soluble)
11. The ability to identify and record relationships between terms or properties
12. The ability to identify opposite relationships (e.g. isMother/isChild)

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13. The ability to declare properties that record measurements
14. The ability to declare properties that record times
15. The ability to associate terms with specific points in process chains

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CWA 02-02.doc - Microsoft Word

Linguistic Terminology	Ontological Terminology	Business Terminology
Plures	Concept	Term/Name
<u>Hypernym</u>	<u>Superclass</u>	Broader Term
Holonym	Subclass	Narrower Term
Synonym	Synonym	Alternative Term
Neer-Synonym		Partially Matches
		Includes
		No Equivalent*
Holonym		Forma Part Of
Meronym		Has Part
		Has Process
Antonym		Opposite
	Restriction	Constraint
		Excludes
	Association	UsedBy
		RelatedTo
		FormaOf
Measurement		MeasurementsRequired
		MeasurementType
		PermittedUnit
Time		TimesRequired
		TimeType

* Indicates that a particular language has no matching term

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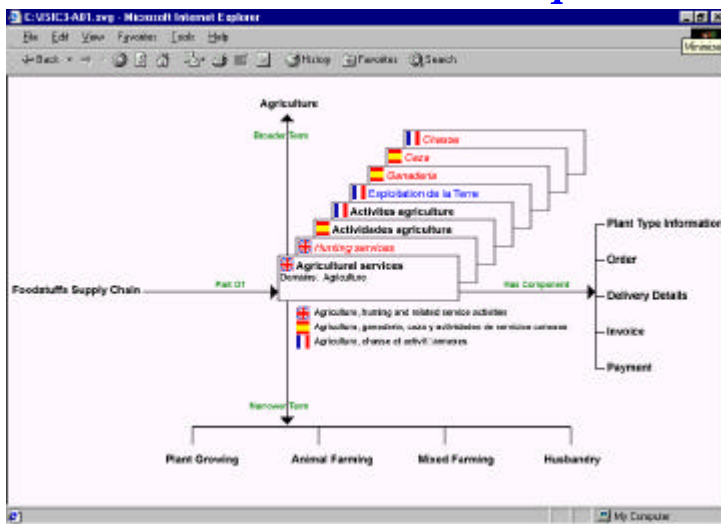
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- ❑ The Diffuse Help Desk is available to help answer questions you may have about the relevance of standards within your organization
- ❑ If the standard you want to know about is not listed, let us know so that we can add it to one of the 31 categories of standards listed
- ❑ Let us know how standards have impacted your research work so that we can share this knowledge through our scheduled reports
- ❑ Join the Diffuse mailing list to get regular updates

The Diffuse Project



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- ❑ TIEKE, Salomonkatu 17A, 10th Floor,
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- ❑ Details of Final Diffuse Conference:
<http://www.diffuse.org/event3.html>
- ❑ MULECO
<http://www.sgml.u-net.com/CWA-04.doc>

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