Aims and Objectives of the Course

- Goals of the Semantic Web
- Foundations of the Semantic Web
- Standards for the Semantic web
- Ontological Engineering
- Programming the Semantic Web
- Semantic Web Applications
- Principles of Linked Data

External Resources

- W3C websiter on Notesale.co.uk http://www.wp.ag/standards/semanticweb
- Additional material on the Blackboard
- Some books
 - Grigori Antoniou, Frank van Harmelen, A Semantic Web Primer, MIT Press, USA, 2008.
 - Hitzler, Pascal, Foundations of Semantic Web technologies, Chapman & Hall, 2009.
 - Semantic Web for the Working Ontologist, Dean Allemang, Jim Hendler, Morgan Kaufmann, 2nd edition.
 - Free online book: Linked Data: Evolving the Web into a Global Data Space.
 - More can be found at: http://www.w3.org/wiki/SwBooks

Preview from Notesale.co.uk Preview page 7 of 65 Introduction to the Semantic Web



Searching the Syntactical e. Hard Work!

- Success of the Webra Search Econes, but
 Results of Web Search have to be interpreted by humans.
- Information overload: The complexity and volume of search results is too large to be handled by humans.
- High recall, low precision: e.g. 20 relevant pages for every 100 irrelevant ones. Too much is as bad as too little.
- Results are sensitive to vocabulary: a big problem with keyword search.
- Most searches target only single web pages. Results of Web searches are not readily accessible by other software tools;

How feasible are some other tasks? • Making complex quelles 65

- - "Find activitation that serves only vegetarian meals from Greece, is does to a central London tube station and where main meals cost less than £10"
 - Find a picture with two animals in it, one is chasing the other.
- Extracting data from repositories:
 - Online shopping, job hunting etc.
- Discovering and using Web services: e.g. booking a holiday
 - Flight Booking, Accommodation Booking Tourist attraction search etc.





We still need a mechanism that allows equivalent resources to be identified and **understood** by machines without programming this knowledge into software.

What is an Ontology?

- History and Origin Notesale.co.uk
 In Charter of the second se
 - In Classical Philosophy.
 - The term "Ontology" is a compound word, originated in Greek, onto (i.e. being or the nature of things.) and logia (i.e. theory).
 - means "nature of existence
 - Definition in the Dictionary (Merriam-Webster)
 - "A branch of metaphysics concerned with the nature and relations of being"
 - "A particular theory about the nature of being or the kinds of • existents (the kind of things that exists) "



Introduction to Description Logic (DK)					
Symbol	.	Serintion.			
	(atomic concertifit	65			
$C, D \longrightarrow A $ $\top $	(unional concept) 58	top			
1 pre	(bottom Dast)	bottom			
$C \sqcap D$	(intersection)	the intersection of two concepts			
$C \sqcup D$	(disjunction)	the union of two concepts			
$\neg C \mid$	(negation)	the complement of a concept			
$\forall R.C \mid$	(value restriction)	the universal restriction of a concept by a role			
$\exists R.C \mid$	(existential quantification)	the existential restriction of a concept by a role			

Example:	Woman	=	Person □ Female
	Man	=	Person □ ¬Woman
	Mother	=	Woman □ ∃hasChild.Person
	Father	=	Man □ ∃hasChild.Person
	Parent	=	$Father \sqcup Mother$
Grai	ndmother	=	Mother □ ∃hasChild.Parent
MotherWithMany Children		=	Mother $\Box \geqslant 3$ hasChild
MotherWithout	Daughter	=	Mother □ ∀hasChild.¬Woman
	Wife	=	Woman ⊓ ∃hasHusband.Man

We'll get back to this later when studying OWL!!



We'll get back to this later when studying reasoning over OWL ontologies!!