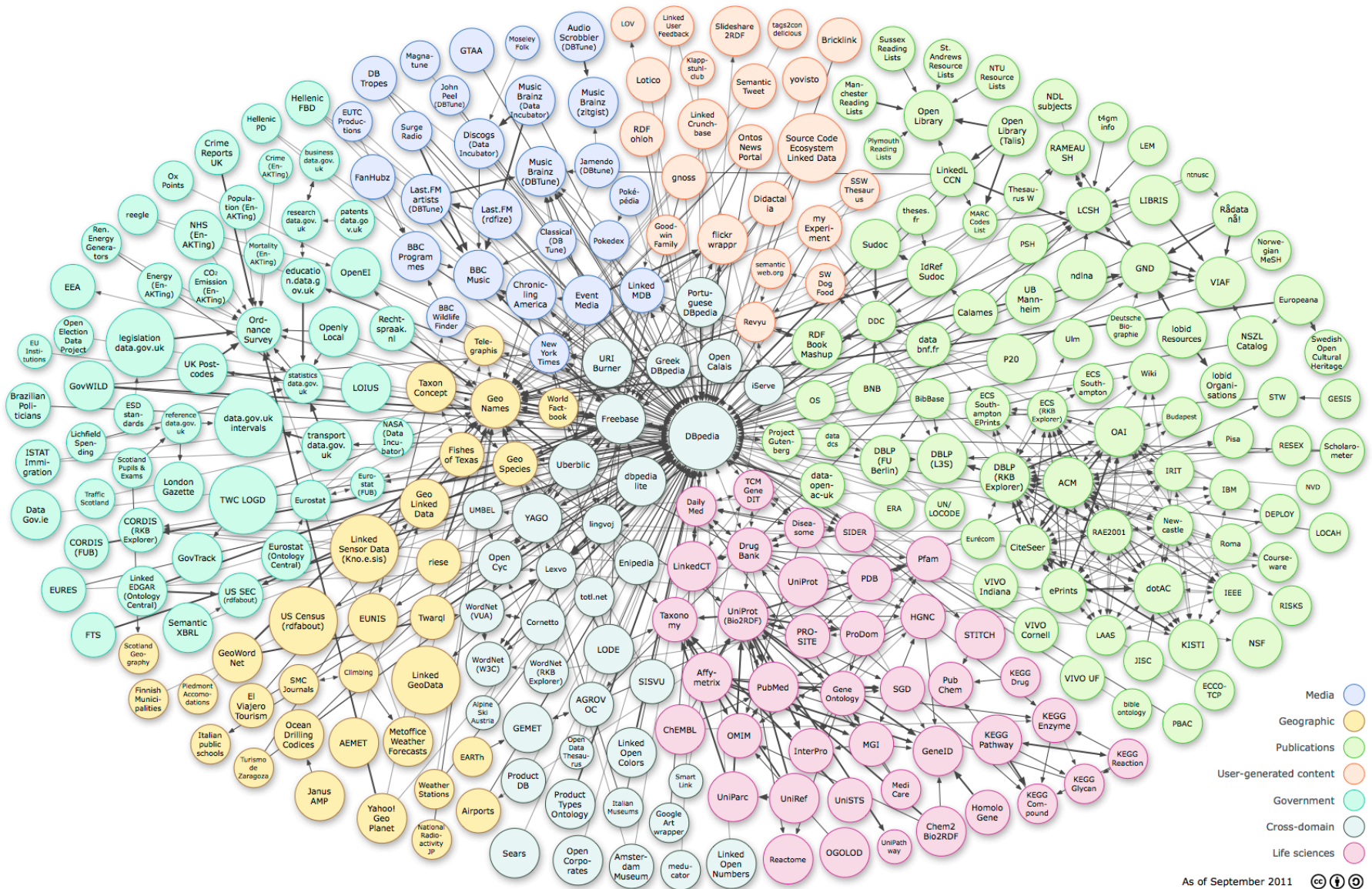# Ontology Driven Data Integration
&
Big Linked Open Data

By *Kingsley Idehen*
Founder & CEO, OpenLink Software

Linked Open Data (LOD) Cloud

As of September 2011

Media
Geographic
Publications
User-generated content
Government
Cross-domain
Life sciences

Situation Analysis – Big Data

Data is growing exponentially

along the following dimensions:

- Volume

- Velocity

- Variety

All of this happens while the total

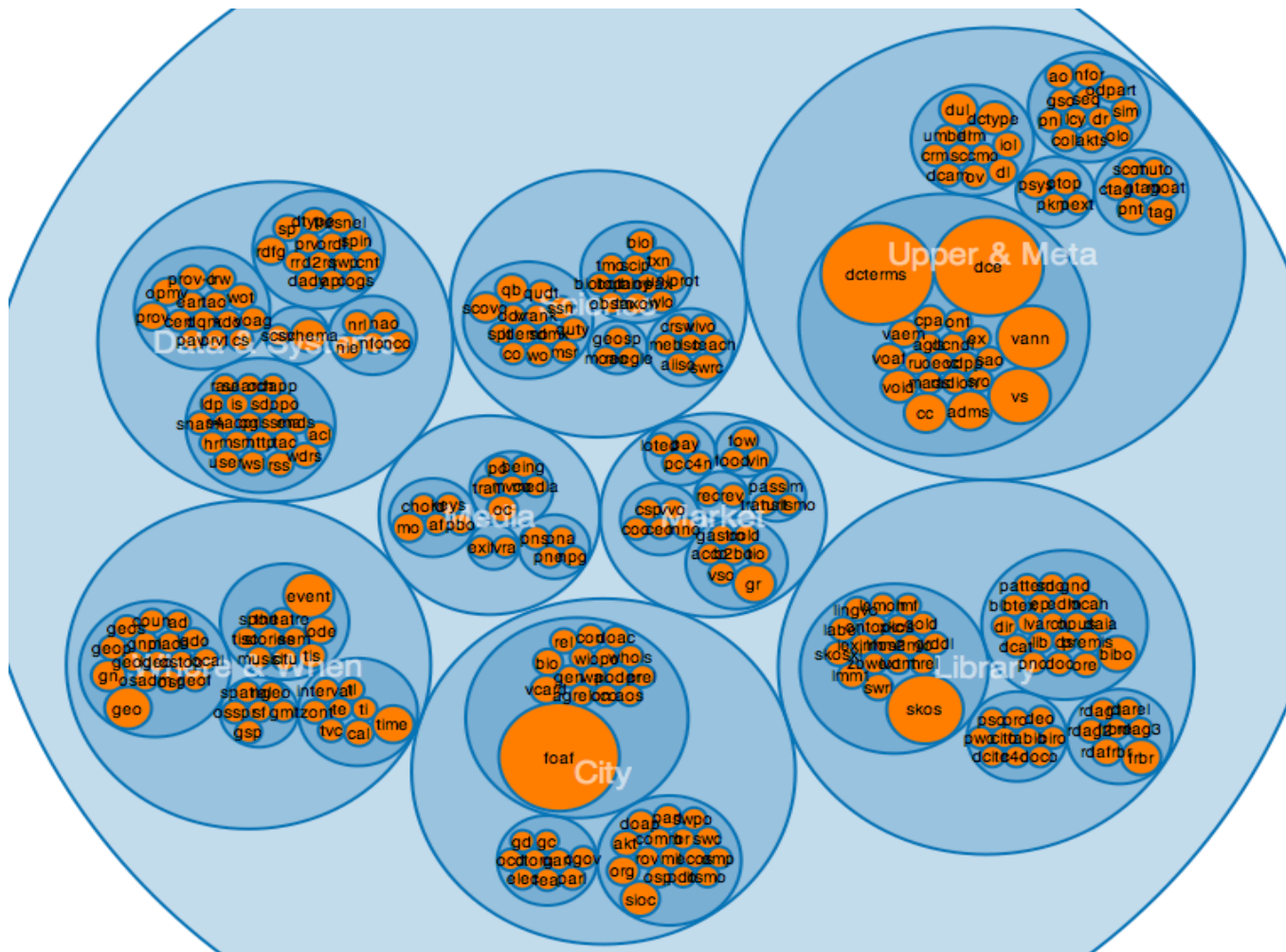hours in day remains 24 hrs.

Situation Analysis – Ontologies

- Definition Conflicts

- Creation Conflicts

  - Notations

- Publication Conflicts

  - Formats

- Discovery Conflicts

- Usage Conflicts

Linked Open Vocabularies (LOV) Cloud

Linked Open Data Creation

- Observe

- Describe Observations in a Document
  - Entity Types (TBox)
  - Relation Types (RBox)
  - Entity Relationships (ABox)

- Publish Document

Shared Ontology Creation

- **Know a Domain (or World)**

- **Describe Domain in a Linked Open Data Document**
  - ○ Entity Types (TBox)
  - ○ Relation Types (RBox)

- **Publish Document to the Web**

Order of Operations?

- Build Ontology First?

- Create & Publish Linked Open Data First?

- A bit of both?

Problem – LOD Document Creator

- Procrastination due to quest for perfect ontology

- Inability to comprehend perfect ontology
  - Due representation notation
  - Relation semantics

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Ontology Creator

- Terminology Disputes

- Relation Semantics Disputes

- Representation Notation Disputes

- Discovery Challenges in regards to related Ontologies.

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Ontology Documents Directory

Index of /DAV/home/kidehen/Public/Linked Data Documents/

Name	Date Modified	Size	Content Type	Owner	Group	Permissions
..						
Offers-Licenses-Products	2012-09-12 18:12:47			kidehen	kidehen	rw-r--r--rm
.DS_Store	2012-09-19 12:19:26	6 K	application/octet-stream	kidehen	kidehen	rw-r-----r
._dbpedia_to_sumo_links.nt	2013-03-21 13:30:59	4 K	application/octet-stream	kidehen	kidehen	rw-r--r--rm
._fao_to_sumo_mappings.txt	2013-03-21 13:30:53	4 K	text/plain	kidehen	kidehen	rw-r--r--rm
._sumo_to_fao_mappings.txt	2013-03-21 13:30:56	4 K	text/plain	kidehen	kidehen	rw-r--r--rm
MyProfile.ttl	2013-01-28 17:56:26	3 K	text/turtle	kidehen	kidehen	rw-r--r--rm
dbpedia_to_fao_mapping.nt	2012-09-06 15:04:17	28 K	text/plain	kidehen	kidehen	rw-r-----r
dbpedia_to_fao_mapping.nt,acl	2012-10-30 10:08:21	924 B	text/turtle	kidehen	kidehen	rw-r-----r
dbpedia_to_sumo_links.nt	2013-03-21 13:30:59	16 K	application/octet-stream	kidehen	kidehen	rw-r--r--rm
fao_to_sumo_mappings.txt	2013-03-21 13:30:38	30 K	text/plain	kidehen	kidehen	rw-r--r--rm
foaf_addressbook.ttl	2013-01-16 17:37:10	445 B	text/turtle	kidehen	kidehen	rw-r--r--rm
ldp_to_sioc_mapping2.ttl	2013-01-29 10:17:31	2 K	text/turtle	kidehen	kidehen	rw-r--r--rm
martin-udogie-podcast-with-ifueko-omogui-okauru	2013-02-01 13:55:11	2 K	text/turtle	kidehen	kidehen	rw-r--r--rm
operating_systems.ttl	2013-01-04 10:27:04	899 K	text/turtle	kidehen	kidehen	rw-r--r--rm
opsys.rdf	2013-01-04 10:32:38	3 M	application/rdf+xml	kidehen	kidehen	rw-r--r--rm
opsys.ttl	2013-01-04 10:22:44	899 K	text/turtle	kidehen	kidehen	rw-r--r--r
personae.ttl	2013-01-03 12:49:15	1711 B	text/turtle	kidehen	kidehen	rw-r--r--r
profile.ttl	2013-01-08 17:32:24	2021 B	text/turtle	kidehen	kidehen	rw-r--r--rm
sumo_to_fao_mappings.txt	2013-03-21 13:30:55	30 K	text/plain	kidehen	kidehen	rw-r--r--rm
test.ttl	2013-01-09 19:22:41	2 K	text/turtle	kidehen	kidehen	rw-r--r--rm
vcard_addressbook.ttl	2013-01-16 17:50:11	492 B	text/turtle	kidehen	kidehen	rw-r--r--rm
vcard_foaf_mapping.ttl	2013-01-16 17:42:26	815 B	text/turtle	kidehen	kidehen	rw-r--r--rm

Class Equivalence Reasoning

foaf:Organization Class Description (LOD Cloud)

Class Equivalence Reasoning

schema.org Organization Class Description – No Inference rules

Class Equivalence Reasoning

schema.org Organization instances -- Inference rules enabled

Class Equivalence Reasoning

schema.org Offers instances -- Inference rules enabled

About: Offering Sponge Permalink
An Entity of Type : owl:Class, within Data Space : lod.openlinksw.com associated with source dataset(s)

New Facets Session with This Class

QRCode

An offering represents the public, not necessarily binding, not necessarily exclusive, announcement by a gr:BusinessEntity to provide (or seek) a certain gr:BusinessFunction for a certain gr:ProductOrService to a specified target audience. An offering is specified by the type of product or service or bundle it refers to, what business function is being offered (sales, rental, ...), and a set of commercial properties. It can either refer to (1) a clearly specified instance (gr:Individual), (2) to a set of anonymous instances of a given type (gr:SomeItems), (3) a product model specification (gr:ProductOrServiceModel), see also section 3.3.3 of the GoodRelations Technical Report. An offering may be constrained in terms of the eligible type of business partner, countries, quantities, and other commercial properties. The definition of the commercial properties, the type of product offered, and the business function are explained in other parts of this vocabulary in more detail. Example: Peter Miller offers to repair TV sets made by Siemens, Volkswagen Innsbruck sells a particular instance of a Volkswagen Golf at $10,000. Compatibility with schema.org: This class is a superclass to http://schema.org/Offer, since gr:Offering can also represent demand.

Attributes	Values
type	Class
equivalentClass	Offer
	Offer
disjointWith	Business entity
	Product or service
	Price specification
	Type and quantity node
	Quantitative value
	»more»
isDefinedBy	GoodRelations Ontology
label	
comment	
is type of	Pilsner Glasses
	Brushed Stainless Beverage Dispenser

Ontology Problem Resolution

Use Inference Rules, conditionally

Using Inference Rules, Conditionally

Enabling or Disabling a specific Inference Rule

Additional Information Links

- An Glossary of terms that includes term descriptions for:

  - Data

  - Big Data

  - Open Data

  - Public Open Data

  - Linked Data

  - Linked Open Data

  - Semantic Web

  - Resource Description Framework (RDF)

Additional Information

- **OpenLink Software:**
  - OpenLink Software
  - OpenLink Virtuoso
  - Universal Data Access Drivers

- **Social Media Data spaces**
  - http://www.linkedin.com/in/kidehen (LinkedIn)
  - https://plus.google.com/112399767740508618350/about (Google+)
  - https://twitter.com/kidehen (Twitter)
  - Hashtag: #LinkedData (Anywhere) .

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