

Semantic methods for the preservation and interpretation of information over time



LongRec, Records Management over Decades

Per Myrseth
DNV Research & Innovation
per.myrseth@dnv.com

■ Project goal

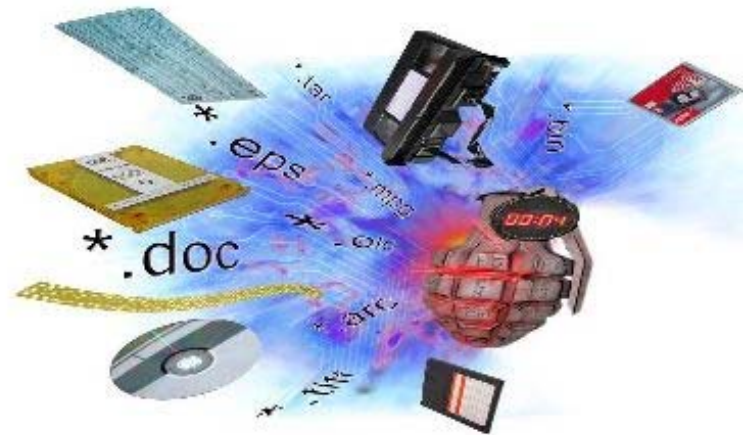
- Persistent, reliable and trustworthy long-term archival of digital documents, with emphasis on availability and use of documents

■ Sub goals:

- Enable transition to digital original documents and digital work processes even for information that must be available and in use over decades
- Explore the potential for commercial products/services in this area

When you can find, read, view and trust your data, you need to understand them, and data must be fit for purpose

- Title: Records Management over Decades
- Home page: www.longrec.com:
- Financed by the Norwegian Research Consul and partners
- Budget 30 mill NOK ++ in the period: 2007-2009
- Project leader: Inger Mette Gustavsen,
inger.mette.gustavsen@dnv.com
- Project owner: Det Norske Veritas



Project partners



Norsk Regnesentral



The National Library



The Ministry
of Foreign
Affairs



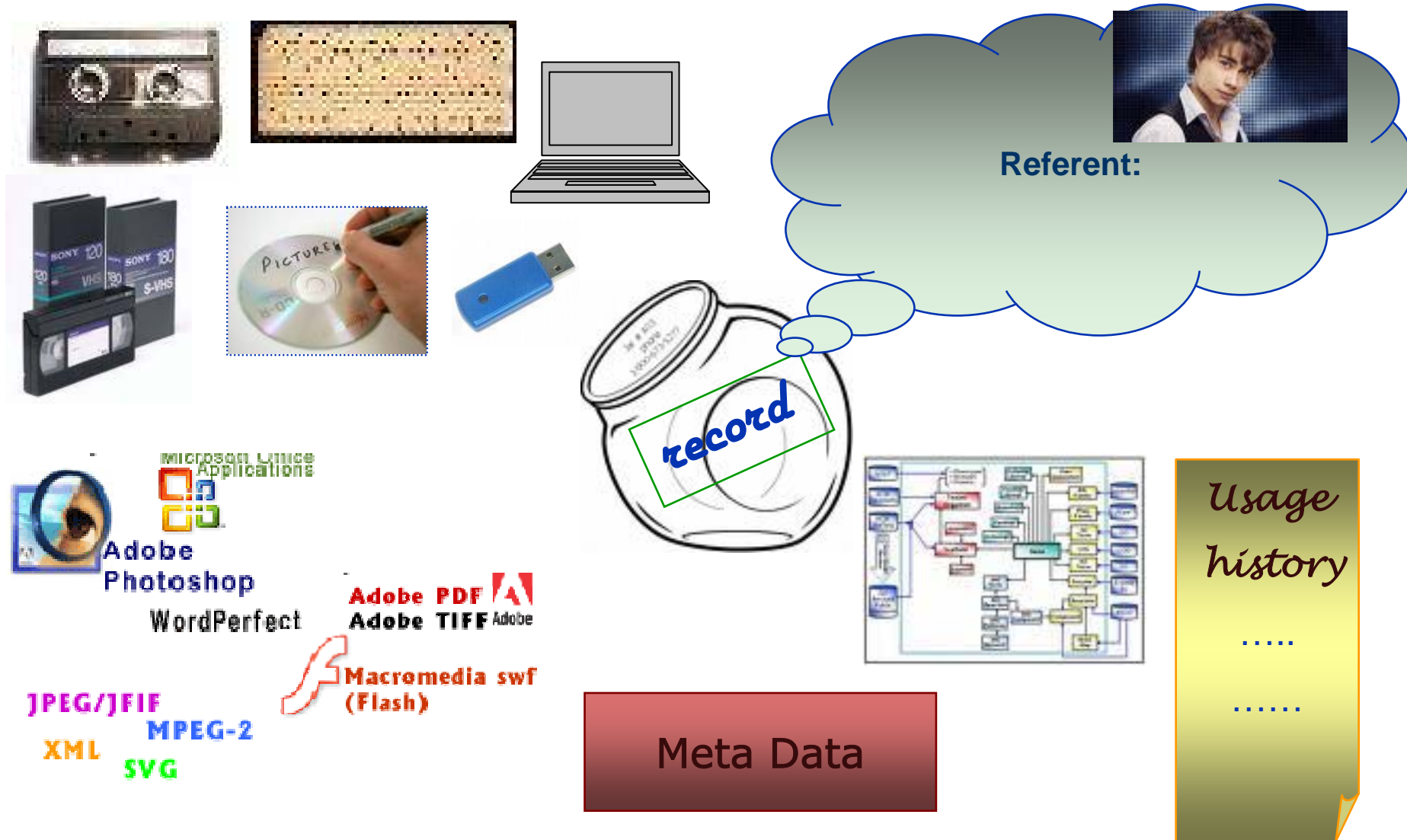
The National
Archival Services
of Norway



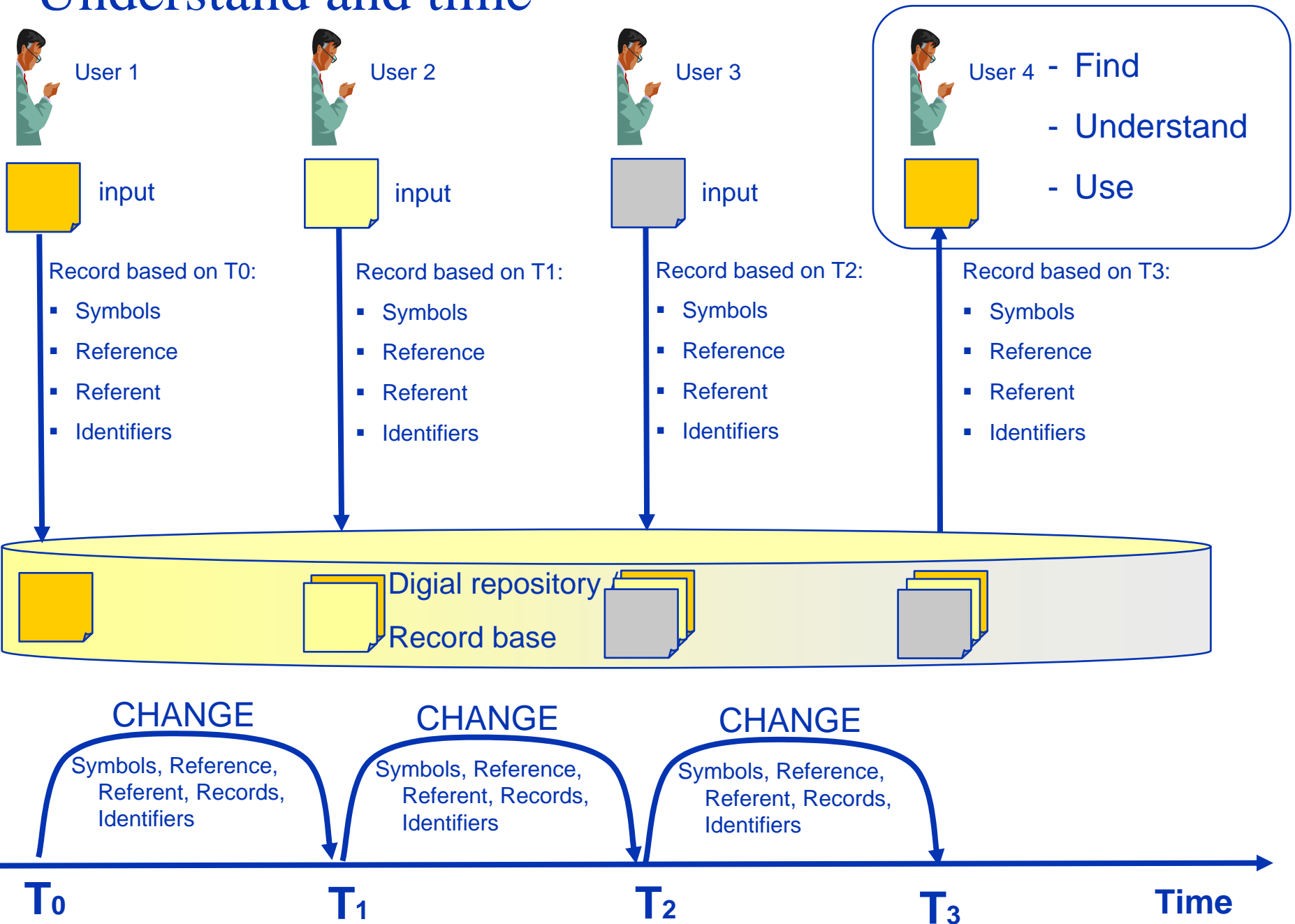
Brønnøysundregistrene

- InterPARES 3: <http://www.interpares.org>
- ICRI (Interdisciplinary Centre for Law and ICT), Katholieke Universiteit Leuven

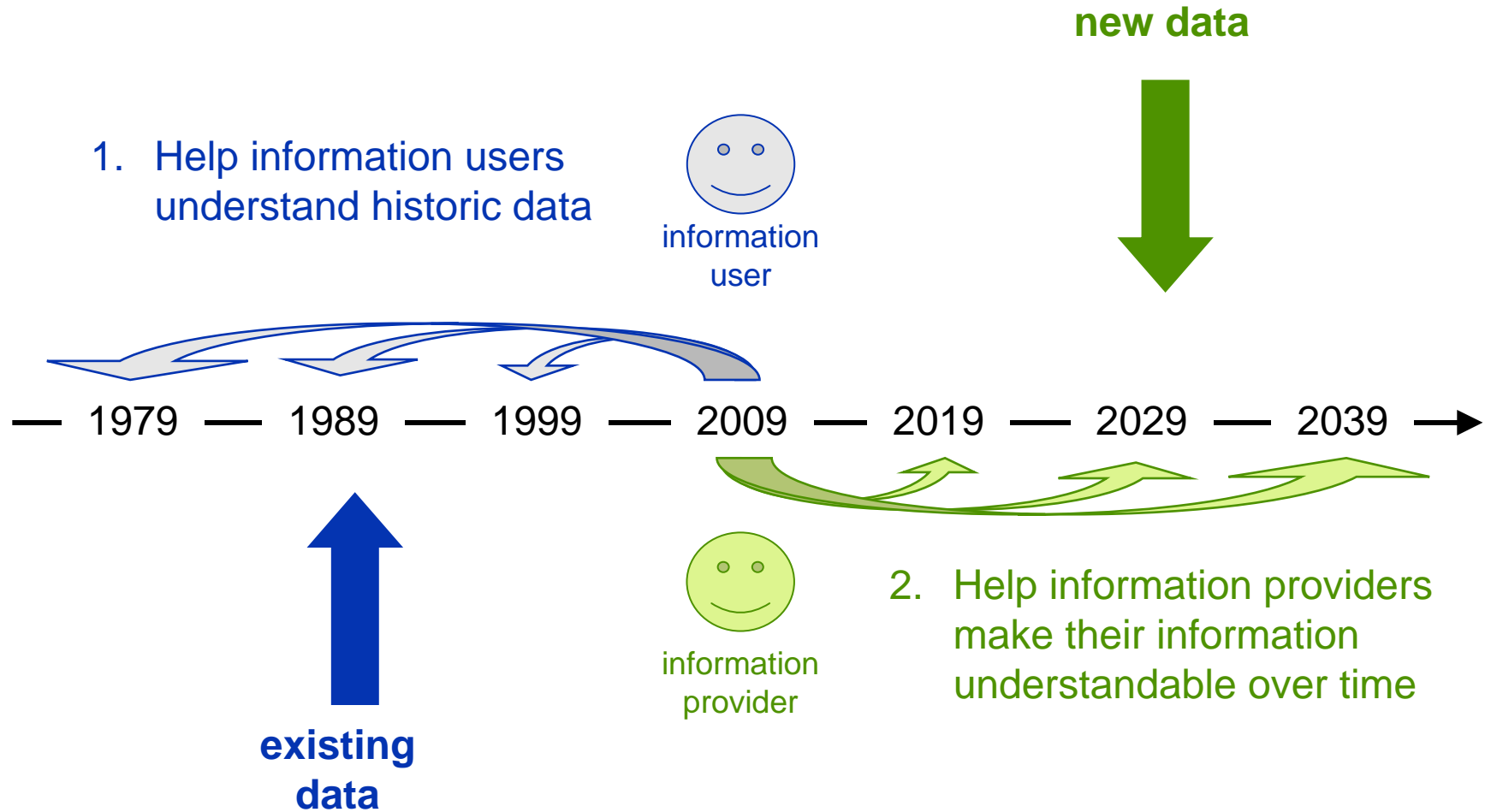
What is an information record?



Understand and time



The general problem



- Type of data in focus: National register of Business Enterprises (national master data) at Brønnøysund Business Register (BR)
- Problem:
 - no tool support for interpreting existing enterprise data in its historic context (silent knowledge in heads of senior BR-employees)
 - no information governance policy for leveraging the implicit semantics of Business Enterprise data in the future
- Today's situation: Semantics of Business Enterprises data are stored in
 - operational procedures
 - regulations and juridical practice
 - tools and systems for registering data in the Business Register
 - Employees head
 - ER models
 - Code tables
 - import and export formats etc.

Enable the interpretation of primary data over time by relating it to and presenting it with relevant secondary data

- Primary data = data in focus, e.g.
 - Norwegian business enterprise
 - Person holding a specific role in a Norwegian enterprise
- Secondary data = relevant context data, e.g.:
 - changes in law and jurisdiction
 - changes in BR's case practice
 - changes in language use (*styreformann* -> *styreleder*)
(can be from both internal and external sources)
 - changes in ID used on referents, concepts, terms, records

- Provide target users with a graphical tool aligning primary data and relevant context data along time.
 - Target users: junior personnel in BR's helpdesk service team
 - External users of data

- Ensure that secondary data is
 - represented more explicitly
 - closely viewable together with the primary data in a suitable graphic interface

- Ability to capture and present secondary data automatically or semi-automatically
- Junior helpdesk personnel at BR perceive the pilot as a good starting point for a useful future support tool

Deliverables related to the pilot

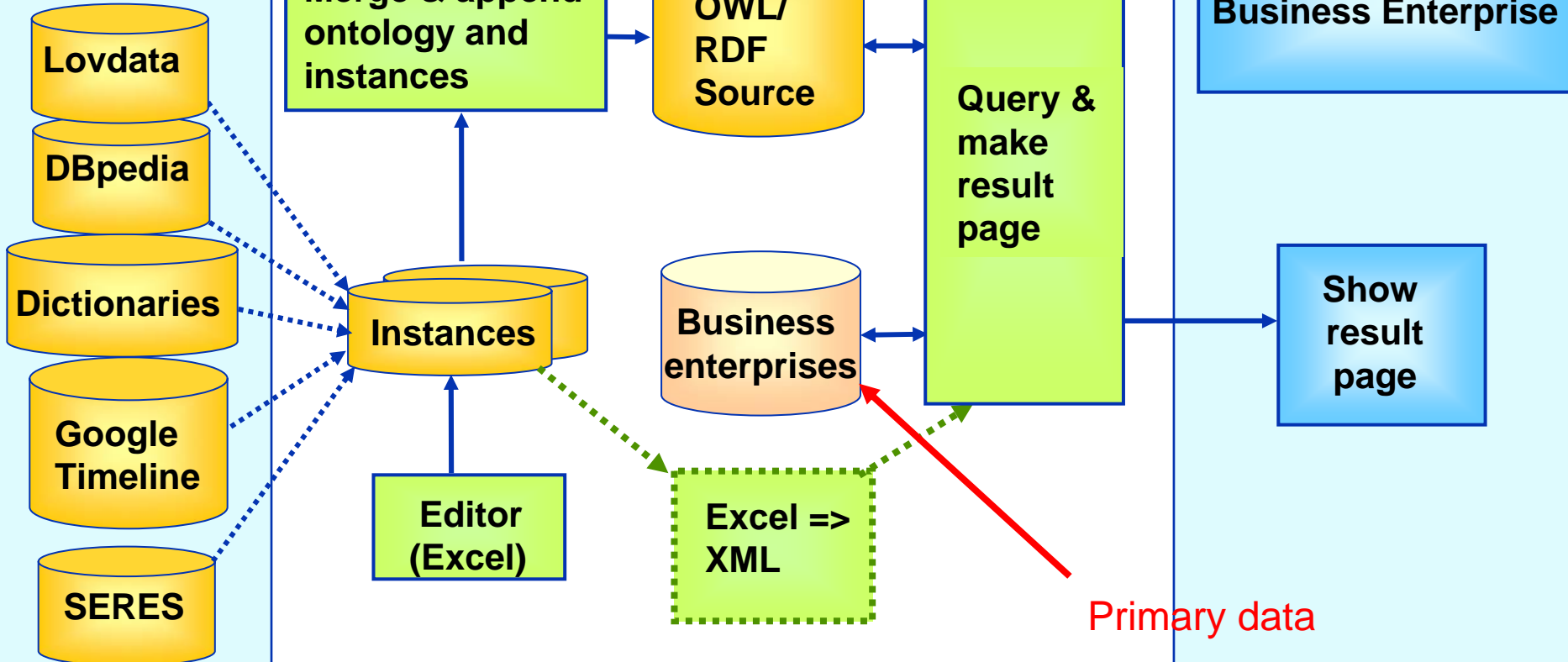
- Pilot software including OWL-model and technical paper
- Paper on legal aspects
 - IPR to data and sw, data quality issues, liabilities, SLA, etc
- Recommendations for an Information Governance Regime for BR ensuring the preservation of semantic value over time

Enterprise History Interpreter

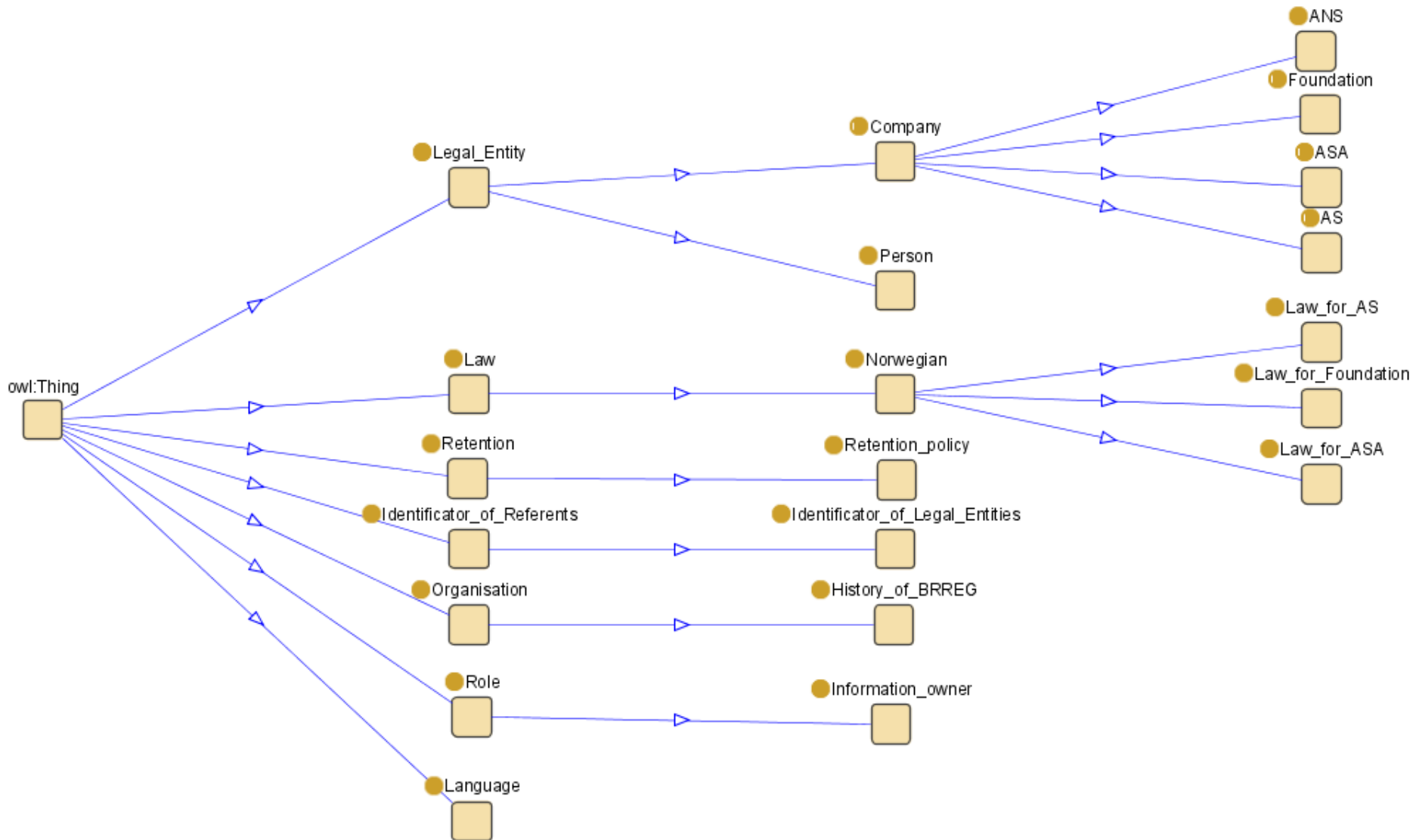
“Open linked data”

Longrec Pilot server

Client
(web-browser)



OWL model (working draft)



Demo: Enterprise History Interpreter

MANAGING RISK



- Business enterprise data
 - Norsk Hydro ASA: 914778271
 - AKER SOLUTIONS ASA: 986529551
- People and their roles in business enterprises
 - Kjell Inge Røkke
- Next Week: Retention of data at StatoilHydro

- Demo to be published at <http://longrec.brreg.no/>

- Improve positive effect of pilot to different types of users
 - Further study of users needs
- Ontology evolution
- Merging of different open data sources (ontology alignment)
- Both human and software interpretation of semantic long term data
- Detecting and measuring semantic drift of concepts
- Access to relevant open data sources
- Strong identifiers, to link different sources of data
- Flexibility in what's primary and what's secondary data.

Interesting Related Examples

- Hans Rosling, Global health expert; data visionary at TED Talks
 - Simulation world health and economic development from 1800 - 2050
 - http://www.ted.com/index.php/speakers/hans_rosling.html
- Google Timeline
 - [Google News Timeline](#) is a web application that organizes search results chronologically. News and other data sources on a browsable, graphical timeline.
 - <http://newstimeline.googlelabs.com/>
- Wolfram|Alpha.
 - Making the world's knowledge computable. Today's Wolfram|Alpha is the first step in an ambitious, long-term project to make all systematic knowledge immediately computable by anyone.
 - <http://www.wolframalpha.com/>
- Google Squared
 - Google Squared returns search results in a spreadsheet format. It structures the unstructured data on web pages.
 - <http://www.twine.com/item/1294x98r7-v30/what-is-google-squared-it-is-how-google-will-crush-wolfram-alpha-exclusive-video>

People involved in the Pilot

- Jostein Dyrkorn, Brønnøysund Register Center
- Even Thorbergesen, Dr.ing, Brønnøysund Register Center
- Alyass Muhammad, Brønnøysund Register Center
- Per Fjelde, Brønnøysund Register Center
- Tor Skjørdal, Brønnøysund Register Center
- Jon Atle Gulla, Professor, NTNU
- Geir Solskinnsbakk, PhD stud. NTNU
- Veronika Haderlein, Dr., Det Norske Veritas
- Olga Cerrato, Det Norske Veritas
- Per Myrseth, Det Norske Veritas

We have been using:

- Protégé 3.4 editor for OWL DL ontology
- Jena to manipulate the ontology
- Sparql for querying
- Java software developed in the project
- Similie.mit.edu Timeline ajax application

Lifespan of Norsk Hydro

Test data from the Brønnøysund Register Center



Styre
Godkjente årsregnskap

Regnskaploven

Lov om årsregnskap m.v. (regnskapsloven).
Fri, 01 Jan 1999 00:00:00 GMT

[Discuss]

Link

§ Regnskaploven

Link => pop-up

1995 1996 1997 2001

BM, RS/6000.

- § Enhetsregisterloven
- § Aksjeloven, endring EØS tilpasning
- Enhetsregisteret settes i drift.
- BR flyttes til Næringsdepartemenetet
- BR får fast internett-tilknytning

● Sammarbeid som leder til Altinn etableres

- Foretaksregisteret satt i drift.
- Siste ND maskin taes ut av drift
- Nettbasert registrering etableres
- BR starter sin metadatasatsning

Language

- AS
- ANS
- I
- Company
- Reter
- Norwegian Person
- Foundation
- Legal_Entity
- Forprosjekt Altinn

http://www.lovdatab.no/cgi-wift/wiftldes?doc=/usr/www/lovdatab/all/nl-19980717-056.html&emne=regnskap*&&

Link => Lovdata

Kjell Inge Røkke

Brønnøysund Register Center.

and 59 roles, roles are truncated in this view.

1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Member of TOMREN VERFT AS					Board member of SKAARFISH GROUP AS				Chairman of AKER RGI HOLDING AS														Chairman of MOLD	
Member of SAGVEIEN 25 AS					Board member of FRIONOR AS				Board member of AKER YARDS AS															Board member of TR
Member of KIR HOLDING AS					Board member of AVANTOR AS				Board member of AKER YARDS AS															Board member of TR
	Board member of HELOX EIENDOM AS							Representative of STIFTELSEN AKER STADION I																Board member of A
	Board member of AVANTOR AS							Chairman of STIFTELSEN AKER STADION I																Chairman of AKER
	Board member of AVANTOR AS							Representative of STIFTELSEN AKER STADION II																Board member of A
	Board member of AVANTOR AS							Board member of AVANTOR AS							Chairman of AKER RGI HOLDING AS									
	Board member of AKER RGI HOLDING AS							Representative of KJELL INGE RØKKE							Chairman of AKER RGI HOLDING AS									
	Board member of AKER RGI HOLDING AS							Board member of AKER YARDS AS							Board member of AVANTOR AS									
	Board member of TOMRA EIENDOM AS							Chairman of STIFTELSEN AKER STADION II																Chairman of TRG H
	Board member of TOMREN VERFT AS							Board member of MIDELFART HOLDING AS																Board member of O
	Board member of AKER LANGSTEN AS							Board member of STADION EIENDOM AS UTELEIEBYGG																Chairman of KV?R
	Board member of SKAARFISH GROUP AS							Board member of MOLDE FOTBALL AS																Board member of AKER RGI HOLDING A
Member of Brattvaag Skipsverft A/S								Board member of AKER SEAFOODS HOLDING AS																General manager of TRG HOLDING AS
Member of AKER LANGSTEN AS								Board member of AKER SEAFOODS HOLDING AS																Chairman of TRG HOLDING AS
Member of SANDAKERVEIEN AS								Board member of AKER SEAFOODS HOLDING AS																Procurement of AKER RGI HOLDING AS



www.dnv.com

The end