Research Infrastructures in the Humanities and the role of Language Technologies

CLARIN: A European Research Infrastructure Project

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Teksty kultury uczestnictwa
Polish Academy of Sciences, Warsaw, 2013-11-07

Paradigm of eScience

- John Taylor
  - Director General of Research Councils, UK Office of Science and Technology
  - “eScience is about global collaboration in key areas of science and the next generation of infrastructures that will enable it”
- **Research Infrastructures** are not another set of short-term technological projects, but
  - long-term investments in services that enable the first class research by combining and sharing resources
  - contain a technological component that demands wisely defined standards for storing and accessing data
- ESF published SPB42 *Research Infrastrucures in the Digital Humanities*

What is research infrastructure?

- different meanings of term “research infrastructure” (RI)
  - a network of funding agencies (FA)
  - a network of research institutions
  - a network of professional associations or initiatives
  - a network of facilities that supports research
    - LHC, accelerators, telescopes, oceanographic ships,...
  - a network of archives of research results
    - digital libraries
    - Open Access initiative (supported by ESF)
  - a network of archives of research data and tools to access them
    - empirical data submittable to impartial examination
    - Permanent Access initiative (supported by ESF)
- this last meaning is important for Humanities (as well as for Social Sciences) (HSS)

What is research infrastructure?

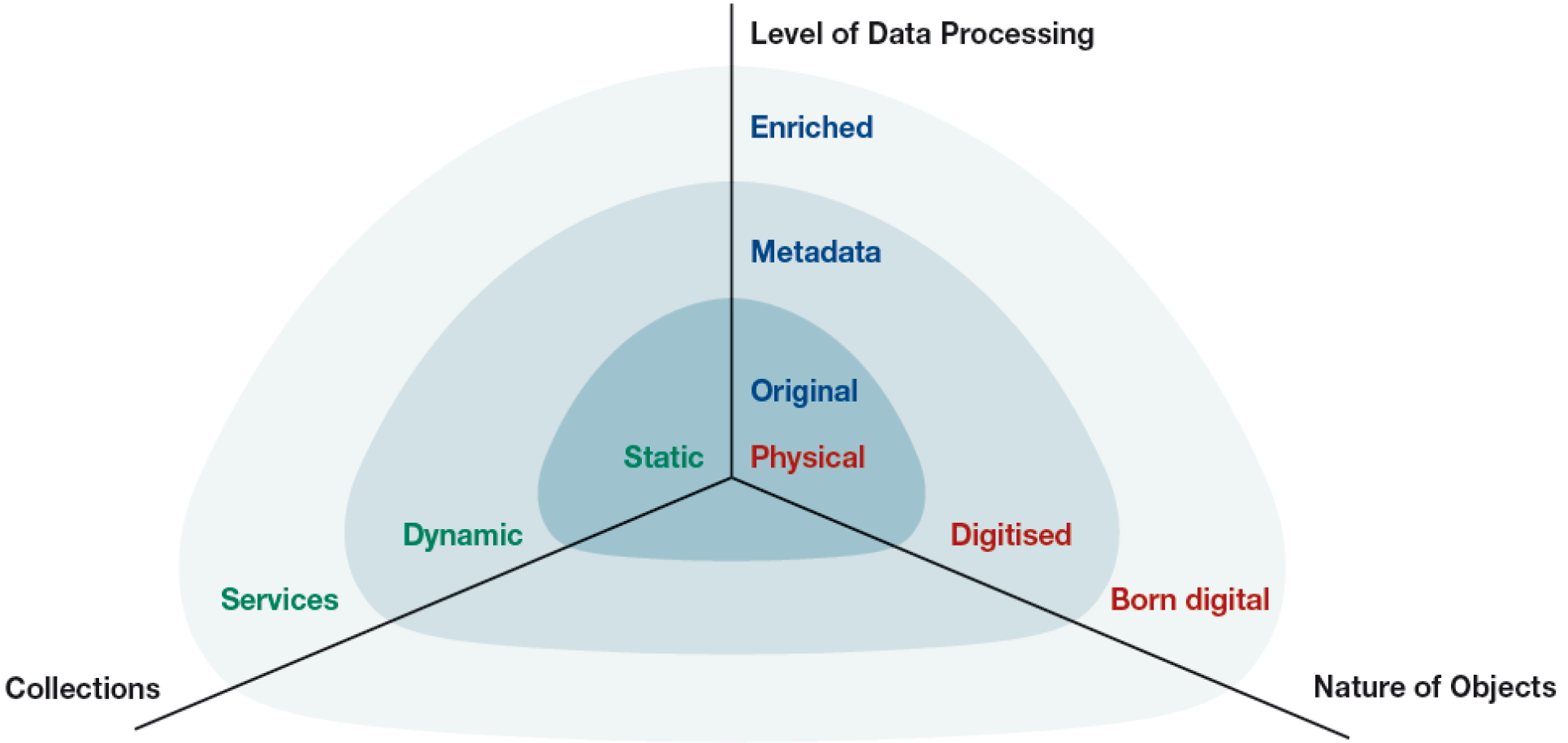
- behind the last meaning of “RI” lays a fundamental epistemological hypothesis: **text is important for HSS**
  - object of research is text itself (and its language/speech)
    - linguistics, all (neo)philologies, phonetics, etc.
  - object of research is mediated through text
    - theory of literature, history, sociology, psychology, cognitive science, information sciences, etc.
- research data for HSS in e-text format: growing rapidly
  - massive digitalisation of traditional texts from paper
  - massive production of new e-text (e.g. Wikipedia, social media...)
- (computational) linguistics (i.e. formal approaches to language)
  - mathematics in HSS (at least for text-based sciences)
- Language Technologies (LT) = its technological application

What is research infrastructure?

- **physical infrastructures**
  - collections of physical objects/installations/vessels/instruments (single-sited or hosted by more than one institution/country)
- **digital data infrastructures**
  - single sited or interconnected data repositories
- **e-infrastructures**
  - networks and/or computing facilities spread over various locations
  - the technical backbone of a given RI: e.g. GRID computing, cluster or cloud computing and the networks that connect them
- **meta-infrastructures**
  - conglomerates of independent RIs, residing in different institutions/ countries with different data formats and data structures (i.e., resulting from different activities)
  - connected using compatible metadata formats or processes, thus enabling access to different data archives

What is research infrastructure?

- Set of concurrent criteria for defining the RI in Humanities



The problems of eHSS

- most of data in digital archives are textually based
  - written language, but also combined with pictures and/or sounds
- many archives known only to local insiders
- archives are mostly not connected
- most of archives have their own standards for storage and access
  - usually only simple retrieval of files (text, audio or video documents) with proprietary indexing and annotation system
  - usually only simple search through files (Ctrl-F or F3)
- HSS researchers are often not aware of the potential benefits of using language technology tools to access e-text
- these tools are hard to use for non-specialist
- usually HSS researchers are not language technologists

The CLARIN Mission

- what?
  - create a Research Infrastructure that makes language resources and technologies (LRT) available to scholars of all disciplines, especially HSS
- how?
  - provide **European federation of digital archives** with language data and tools (text, speech, multimodal, gesture…)
  - target audience: **humanities and social sciences scholars**
  - access: **single uniform sign-in** access to the archives
  - means: **language and speech technology tools** to retrieve, manipulate, enhance, explore and exploit data
  - coverage: **all languages** are equally important
  - location: **all EU and associated countries** included

Why a European RI?

- too much fragmentation
- lack of
  - coordination
  - visibility
  - interoperability
  - sustainability

  achievable by using unifying standards (TEI, IsoCAT,...)
- expertise exists but not in all countries
- language independent tools can be shared
- language dependent tools can often be ported
- most countries not able to bear the cost of infrastructure alone

Why now?

- exponentia
  - e-text en
- maturity of
  - allows fo
  - allows fo
  - allows fo
  - allows fo
- growing int
- ESFRI Roa
  proposals f
  - HSS: CE
- European
  - since 20

Human-Generated Internet Content: Zettabyte of Unstructured BIG Data

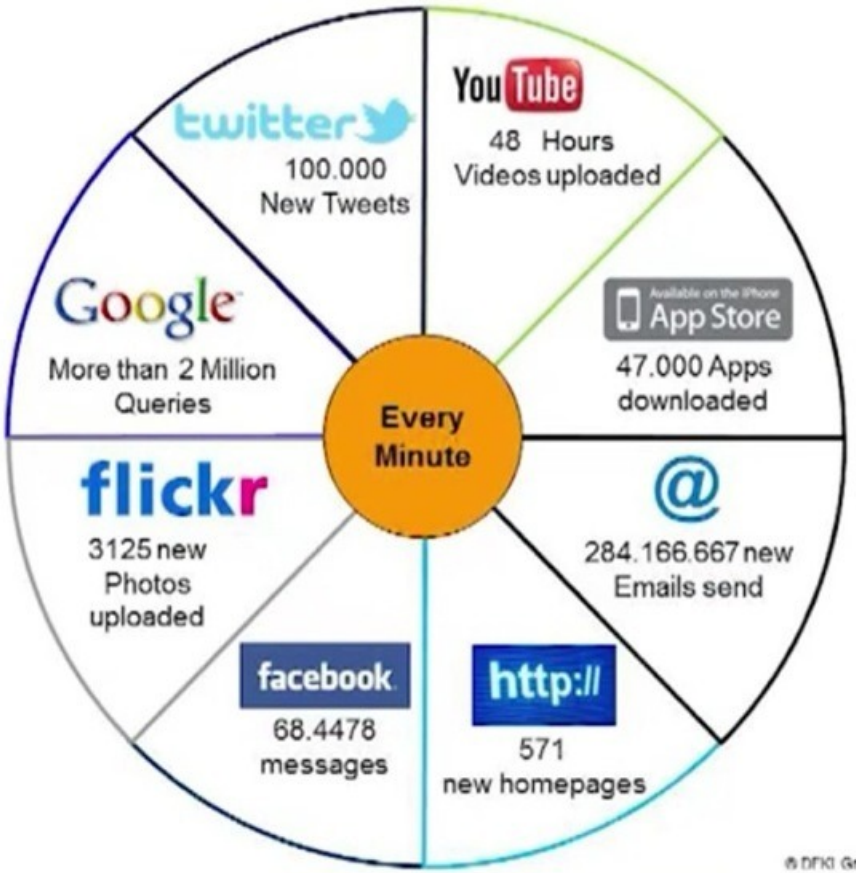
META FORUM 2013

Exponential Growth of Internet Data:

Commercial Spoken Language Access:

Siri (Apple)
Google Now (Google)
S Voice (Samsung)
Cortana (Microsoft)

Still Missing:
Crosslingual Information Retrieval



Wolfgang Wahlster: Language Technology for Big Data Analytics. META-FORUM 2013-09-19, Berlin

What was CLARIN project?

- CLARIN stands for
  - Common Language Resources and Technology Infrastructure (for the Humanities and Social Sciences)
- FP7 RI project
  - started 2008-01-01, ended 2011-06-30
- development of RI in 3 phases
  - preparatory phase
    - 2008-2011: planning, building a prototype
    - budget: 4.1 M€ from EC, ca 5 M€ from participating countries
  - construction phase
    - 2011-2015: building and populating with resources and tools
    - national CLARIN consortia (CLARIN-NL, CLARIN-D, CLARIN-PL...)
  - exploitation phase
    - 2016-: CLARIN infrastructure in full service

What was CLARIN project?

- CLARIN consortium
  - 33 partners from 23 EU and accessing countries
- CLARIN community
  - 151 member from 33 countries
  - interest from Americas, Asia, Australia and Africa
- leading partners
  - Utrecht University (Steven Krauwer, coordinator)
  - Max Planck Institute, Nijmegen (Peter Wittenburg)
  - Oxford University, OTA (Martin Wynne)
  - Hungarian Academy (Tamás Váradi)
  - ...
- CLARIN was based on four previous initiatives
  - LangWeb, EARL, TELRI I & II, DAM-LR

What was CLARIN project?

- CLARIN started as a Preparatory Phase project
  - bottom-up building procedure (incl. national CLARIN teams)
  - large LRT registry (840 LR, 150 LT, 195 languages) produced
  - technical specification defined
  - a series of usage scenarios for HSS as demo prototypes
- procedures
  - using/adapting standards (if necessary also creating new)
  - using metadata (as a “glue” between digital archives)
  - using persistent identifiers (PID), authorisation/autentification
  - offering web-access to LR
  - offering LT as webservices

What CLARIN project wasn't?

- building infrastructure
  - it was only being planned
- creating new resources
  - we were combining and adapting existing resources
- doing new research
  - we were using available results
- focusing on the big languages
  - we found all languages equally important

What is CLARIN ERIC?

- established 2012-04-18
- 9 founding members (countries or international entities)
  - Austria, Bulgaria, Czech Republic, Danmark, Estonia, Germany, Netherlands, Dutch Language Union, Poland
  - some countries signed the memorandum of understanding (Norway, Croatia, Lithuania...)
- each member is supporting a national CLARIN consortium
  - building the infrastructure at national level
  - connecting the infrastructure with CLARIN-ERIC at European level
- http://www.clarin.eu

Summing up

- one day the HSS scholar should be able to use the same unified web interface to infrastructure and ask questions like:
  - "List all uses of enthusiasm in 19th century English novels written by women."
  - "Display all maps between 15th and 18th century showing Danube and Vienna."
  - "Show me all possible translations of saudade in Camões' works and which of them appeared in Lithuanian translations."
  - "Summarize *Le Monde* of June 11th 2009 – in Polish."
  - "Who was mentioned in the same documents with Konrad Adenauer during 1951?"
  - full-blown named entity recognition of web version of daily newspaper for under-resourced language (Croatian) →

Home

Aktualnosti
Vijesti
Crna kronika
Sport
Scena
Kultura
Gospodarstvo
Poslovni svijet
Zanimljivosti
Regije

Free Time
Kompas
Događanja
Kino
TV Vodič
Vrijeme
Lifestyle
Nedjeljni Večernji

NOVO
Vijesti bez slika
Moja karijera
e-Shop

→ Gospodarstvo → Poslovni svijet

25.01.2005 18:45

Hrvatski izvoz još na niskim razinama

90 posto tvrtki uopće ne izvozi!

Autor **Piše Josip Bohutinski**

Hrvatski izvoz napokon je prošle godine počeo rasti brže od uvoza te je, prema podacima za prvih 11 mjeseci 2004. godine, izvoz u kunama rastao 15,7 posto a uvoz 5,7 posto. Iz Hrvatske je izvezeno robe u vrijednosti nešto manjoj od 44 milijardi kuna ili 7,25 milijardi američkih dolara, dok je vrijednost uvoza bila 91,19 milijardi kuna ili više od 15 milijardi dolara.

No podaci o izvozu po glavi stanovnika upozoravaju da je hrvatski izvoz još na niskim razinama u usporedbi s drugim i sličnim zemljama. Prema podacima udruge Hrvatski izvoznici, u 2003. godini vrijednost hrvatskog izvoza po glavi stanovnika bila je samo 1106 dolara.

Koliko je je to mala vrijednost, govori podatak o slovenskom izvozu po glavi stanovnika od čak 4774 dolara. Irska na svakog svoga stanovnika izveze 22.119 dolara roba i usluga. Amerikanci, pak, po glavi stanovnika izvezu robe u vrijednosti 2360

Ostale vijesti
- Novi igrači zajedno protiv T-HT-a?
- Hrvatska ipak nije prezadužena
- Povjerenstva odvaguju veletrgovine
- Državne banke kreću u investicijsko bankarstvo
- Dubrovnik ne bi smio dominirati u promidžbi
- Fokus na Sirelu i Somboled
- Dioničari ne žele novac nego banku

Prijava
Korisničko ime
Lozinka
Prijava
→ Registrirajte se!
→ Zaboravili ste lozinku?

Kolumna

→ Nakon revolucije, slijedi evolucija

→ Devizno tržište
→ Tržište novca
→ Tržište obveznica
→ Tržište kapitala
→ Karijere

Večernji list, 2005-02-17, Gospodarstvo

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No vrijednost izvoza velikih zemalja po glavi stanovnika u pravilu je manja od izvoza malih zemalja zbog velikog domaćeg tržišta koje može apsorbirati veliki dio domaće prozivodnje. To potvrđuju i podaci o izvozu po stanovniku i "malih zemalja" poput **Belgije**, **Nizozemske** i **Finske**.

Uz malu vrijednost izvoza po glavi stanovnika, za **Hrvatsku** je nepovoljan i podatak o broju domaćih tvrtki čija godišnja vrijednost izvoza premašuje **milijun kuna**.

Njih je samo **pet posto** od ukupno aktivnih poduzeća. Naime, prema podacima Hrvatskih izvoznika, od 70-ak tisuća aktivnih kompanija u **Hrvatskoj**, svoje proizvode i usluge na strana tržišta izvozi samo njih 6700. Pritom je izvoznika čija vrijednost izvoza premašuje **milijun kuna** samo 3144. Ta grupa izvoznika, prema podacima udruge Hrvatski izvoznici, ostvaruje čak **96 posto** ukupnog hrvatskog izvoza.

Koliko je bitna uloga izvoznika u cjelokupnom hrvatkom gospodarstvu, potvrđuje podatak da 2688 izvoznika izdvaja **83 posto** ukupne dobiti u **Hrvatskoj**, odnosno 16,6 od **19,9 milijardi dolara**.

Upozoravajući na podatke o hrvatskom izvozu po glavi stanovnika, predsjednik Hrvatskih izvoznika **Darinko Bago**, prilikom prošlotjednog potpisivanja Sporazuma o suradnji s **Hrvatskom** bankom za obnovu i razvitak, najavio je sklapanje sličnih sporazuma s drugim udruženjima i institucijama koje mogu pridonijeti afirmaciji hrvatskog izvoza, bez kojeg, naglasio je **Bago**, **Hrvatska** nema budućnosti.

A velike zasluge za prošlogodišnji brži rast hrvatskog izvoza sigurno ima upravo **HBOR** i njegovi programi poticanja izvoza. Preko programa Kreditiranje priprema roba za izvoz i izvoza roba **lani** je odobreno 170 kredita u vrijednosti **1,25 milijardi kuna**, što je čak **448 posto** veći iznos nego **2003. godine** kada su odobrena 52 kredita, ukupno vrijedna nešto više od **279 milijuna kuna**.

I Program osiguranja izvoza zabilježio je **lani** veliki rast. U **2004. godini** osiguran je promet od **580 milijuna kuna**, što je povećanje**180 posto** prema **prethodnoj godini**, a odobreno je 357 zahtjeva, što je povećanje od **306 posto**. **Lani** je **HBOR** osigurao izvoz 67 izvoznika, za razliku od 35 u **2003. godini**. Od početka poslovanja **HBOR** je dosad isplatio 12 odšteta u iznosu **3,2 milijuna kuna**, a od toga je **lani** četvero izvoznika dobilo odštetu od **538.000 kuna**.

Predsjednik Uprave **HBOR-a** **Anton Kovačev**, potpisujući sporazum s Hrvatskim izvoznicima, rekao je da je **2004.** bila godina izvoza za njegovu banku te da se nada da će ova biti izvozna za cijelu **Hrvatsku**, čemu bi trebao pridonijeti i sporazum o suradnji **HBOR-a** i **HIZ-a**.

Kovačev je upozorio i da rast hrvatskog izvoza **lani** nije isključivo rezultat brodogradnje.

- Oko **90 posto** kredita koje smo dali za priremu roba za izvoz i izvoz roba odnosi se na prerađivačku industriju, poput prehrambene, metalske, farmaceutske i drvne industrije. A te industrije su ostvarile porast izvoza **6,5 posto**, što je veći rast od prosječnog ukupnog rasta od **15,7 posto** - rekao je **Kovačev**.

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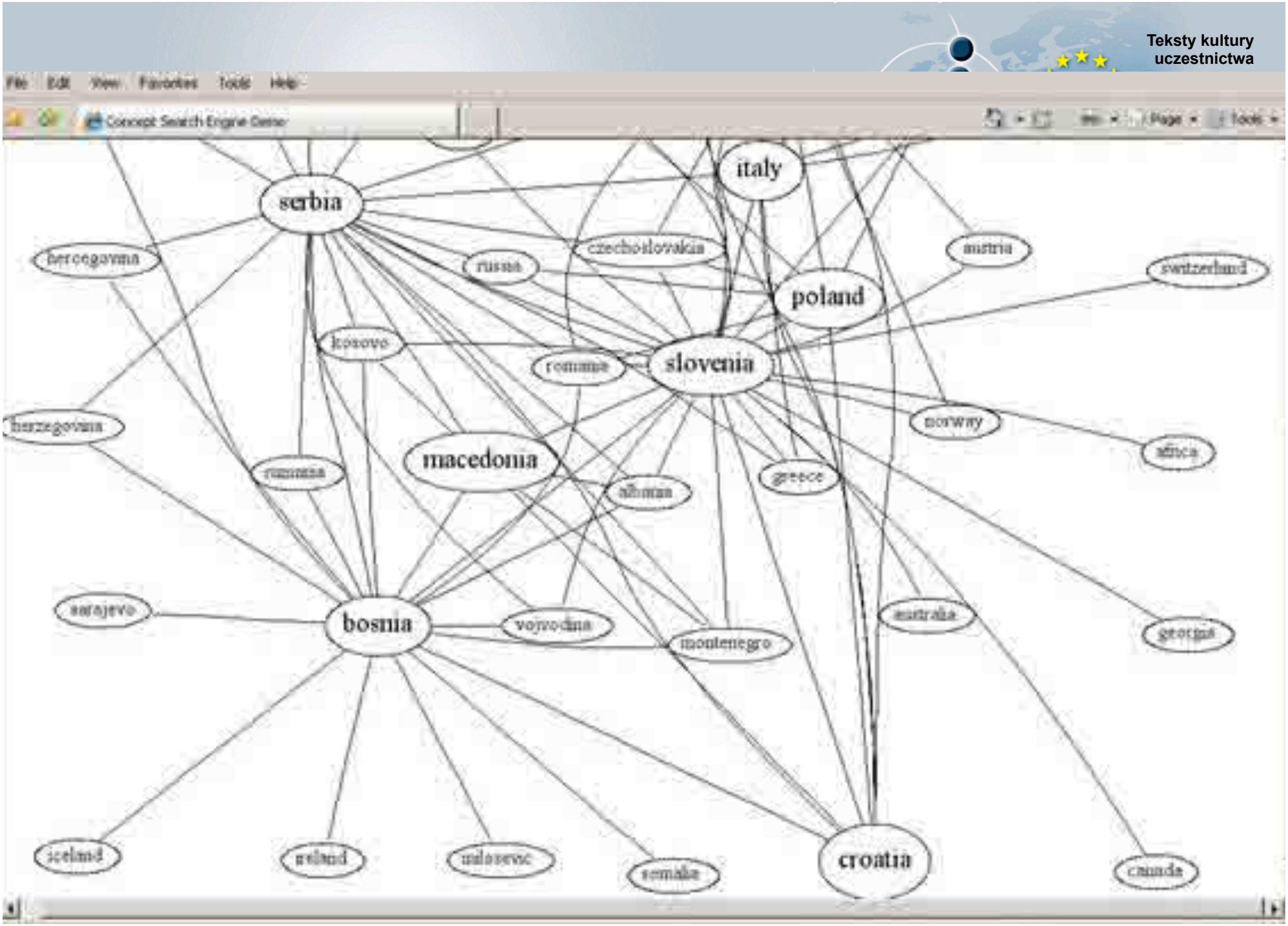
numerical and percentual values
temporal expressions
persons
locations
organizations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Concept Search Engine Demo
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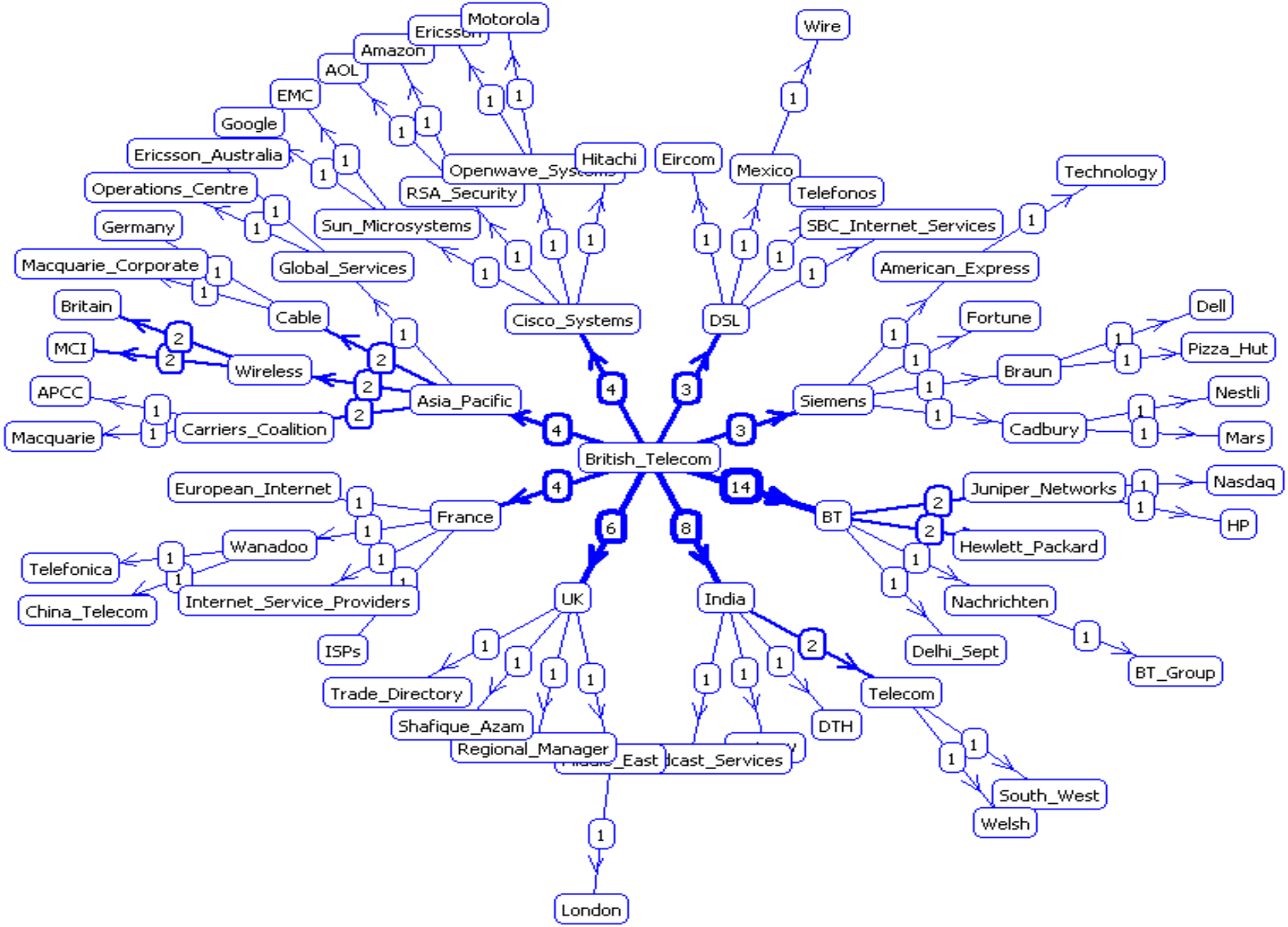
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Germany
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Britain
MCI
APCC
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Eircom
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Wire
Telefonos
SBC_Internet_Services
American_Express
Technology
Fortune
Braun
Cadbury
Dell
Pizza_Hut
Nestli
Mars
Juniper_Networks
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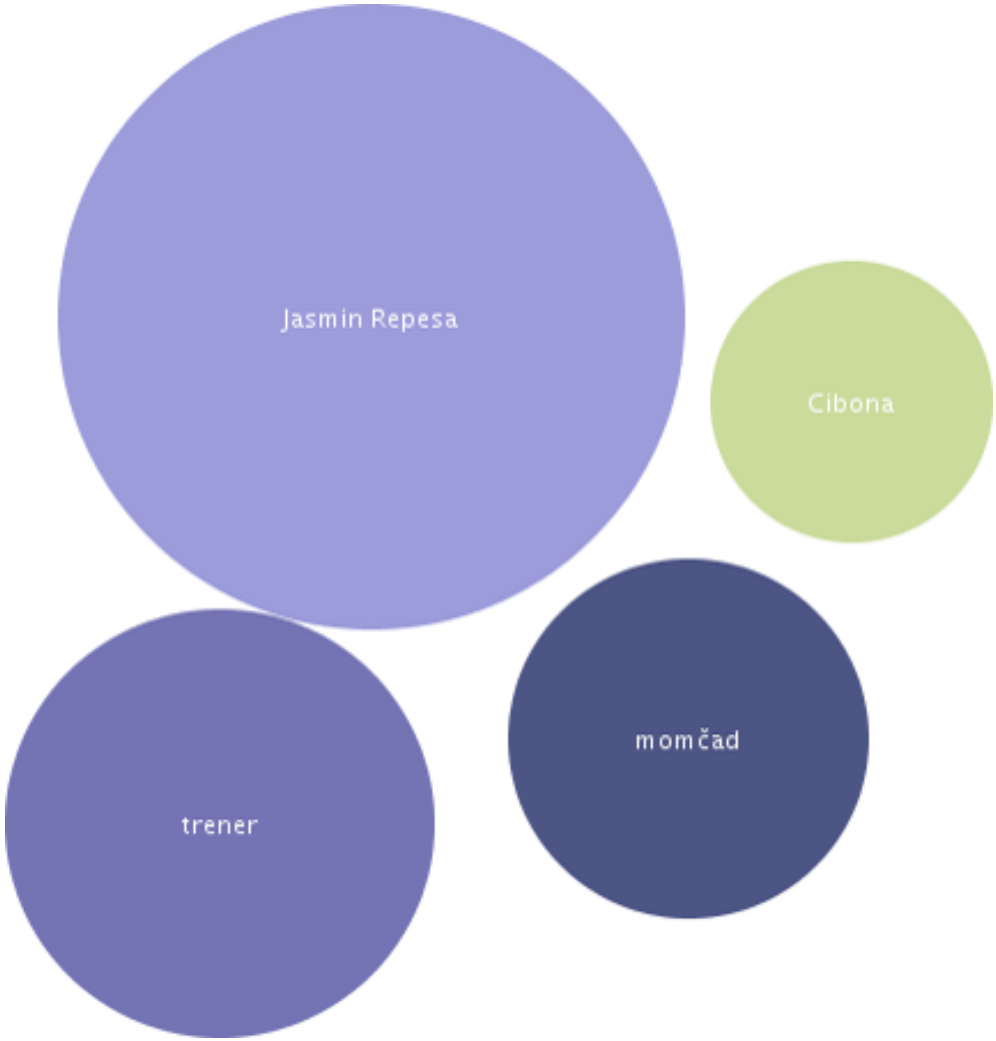
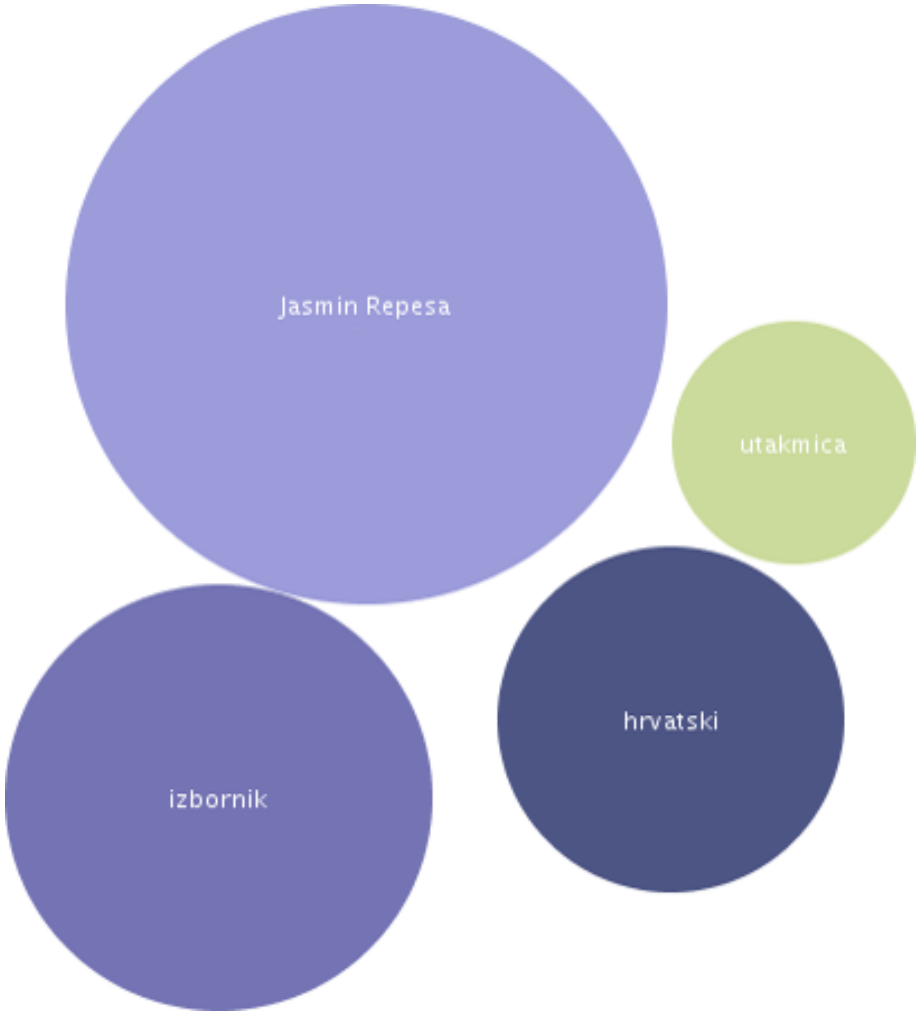
HP
Hewlett_Packard
Nachrichten
BT_Group
Delhi_Sept
European_Internet
Wanadoo
Telefonica
China_Telecom
Internet_Service_Providers
ISPs
Trade_Directory
Shafique_Azam
Regional_Manager
London
DTH
Telecom
South_West
Welsh

Tracking NE over time

2001



2009



Weblicht pipelines

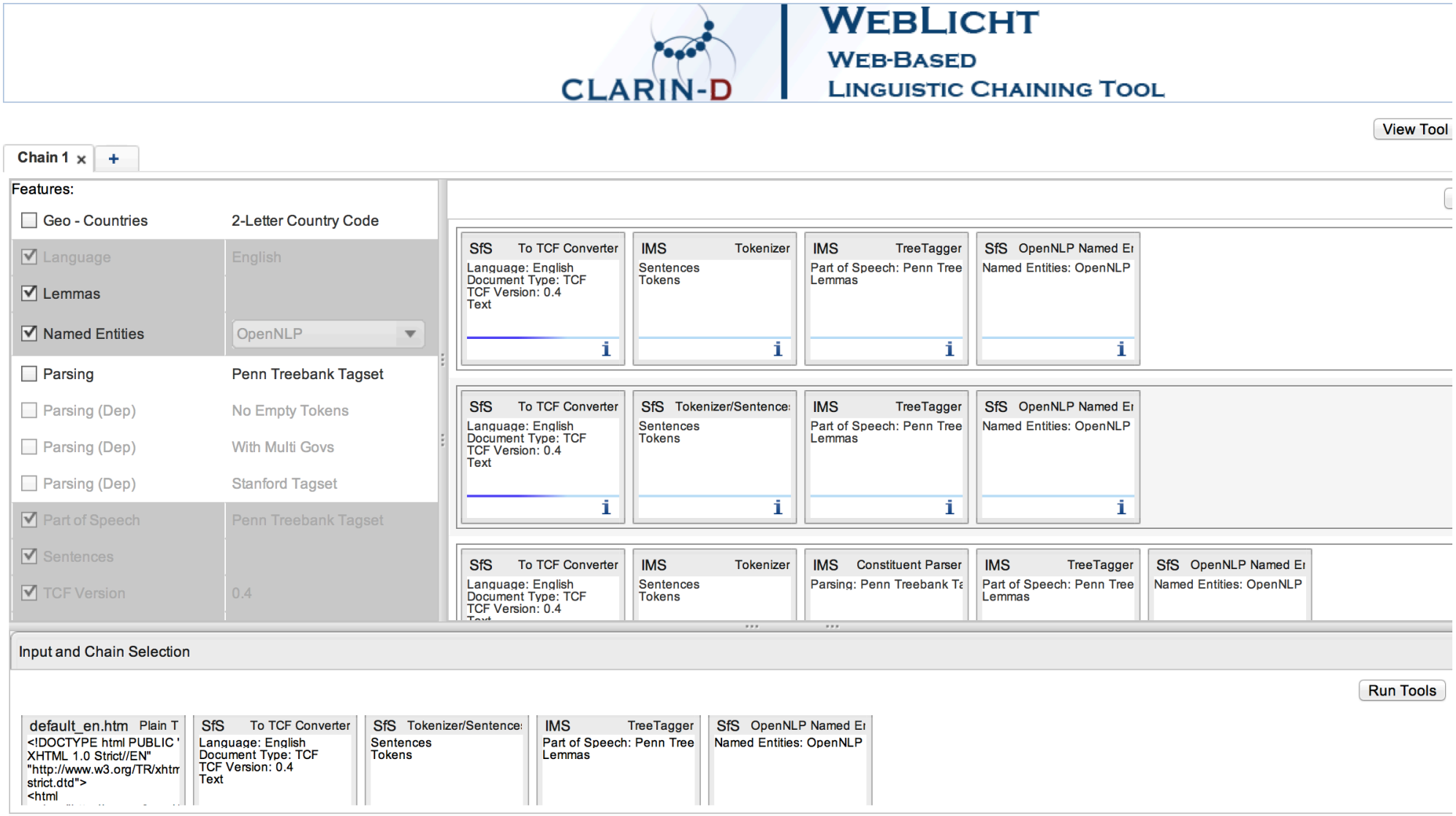
- using LT modules as basic building blocks for pipelines used in procesing texts, e.g.
  - sentence/clause splitter
  - tokenizer
  - lemmatizer
  - POS/MSD-tagger
  - named entities recognition and classification (NERC)
  - parser (subject, verb, object)
- pipelines freely configurable by user

Weblicht pipelines

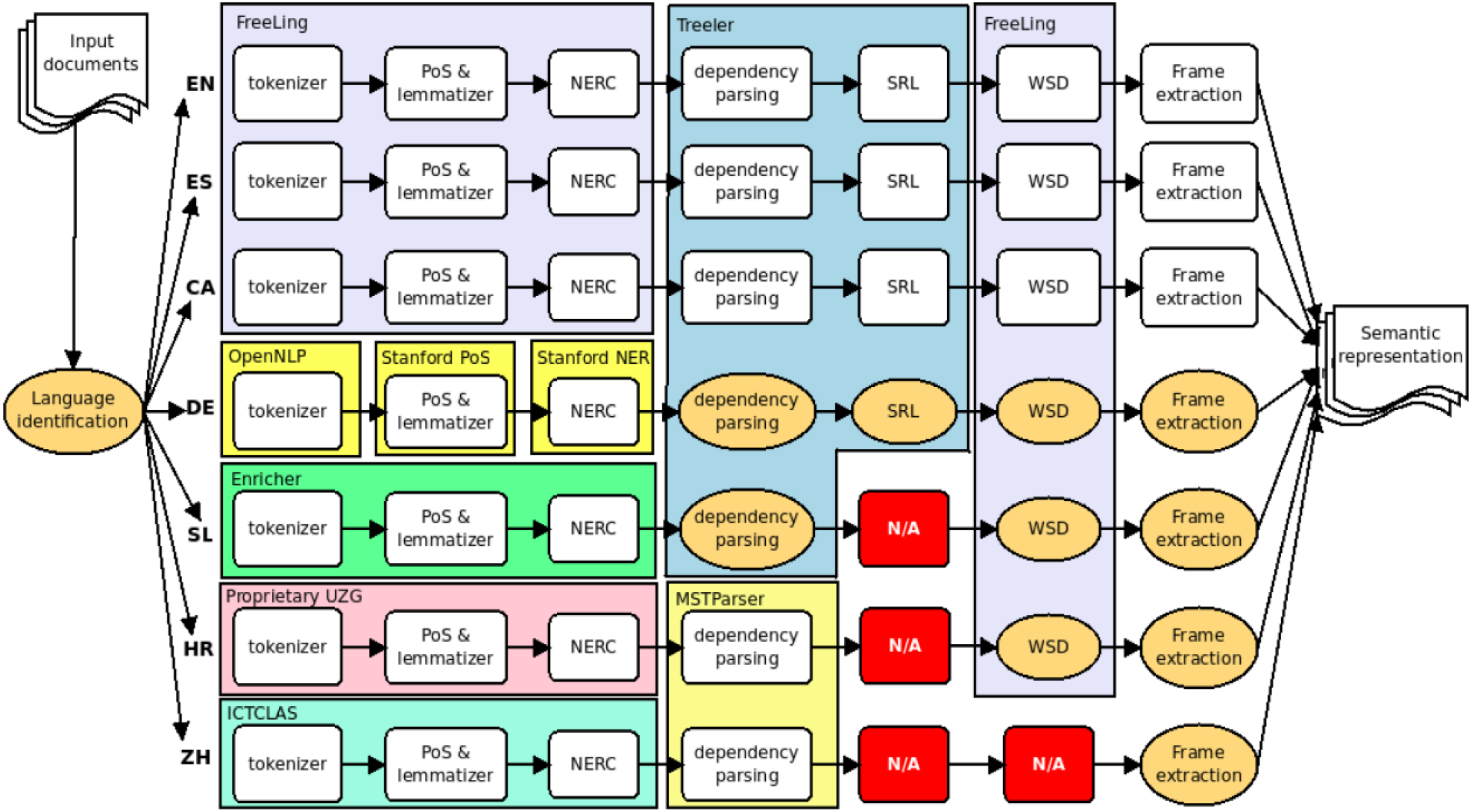
Teksty kultury
uczestnictwa
Warsaw
2013-11-07

CLARIN-D

WEBLICHT
WEB-BASED
LINGUISTIC CHAINING TOOL

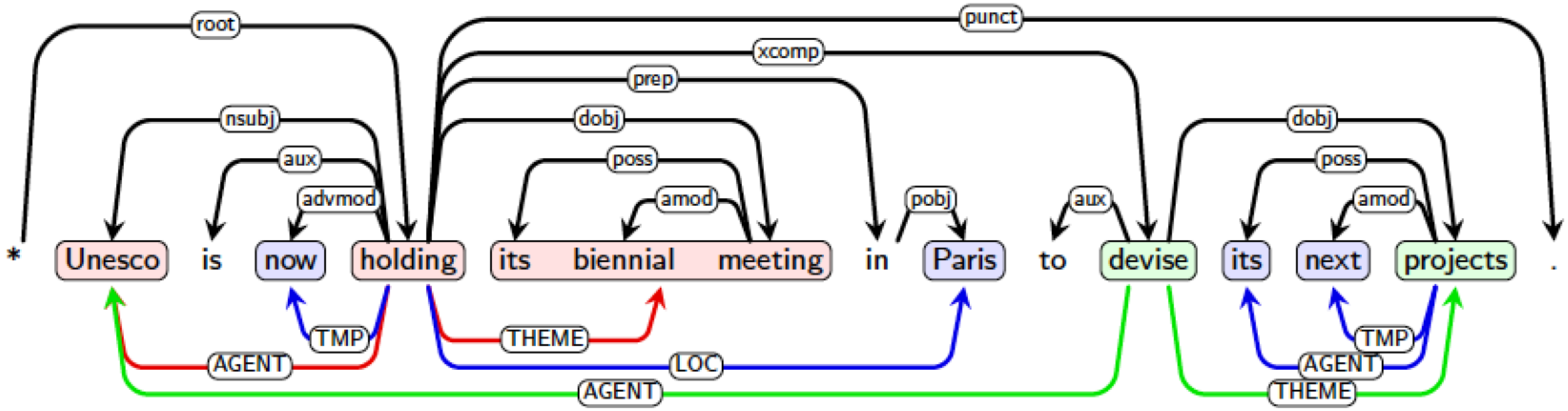


XLike project: multilingual pipelines



XLike project: multilingual pipelines

- starting from
  - “Unesco is now holding its biennial meeting in Paris to devise its next projects.”
- at the end we come to



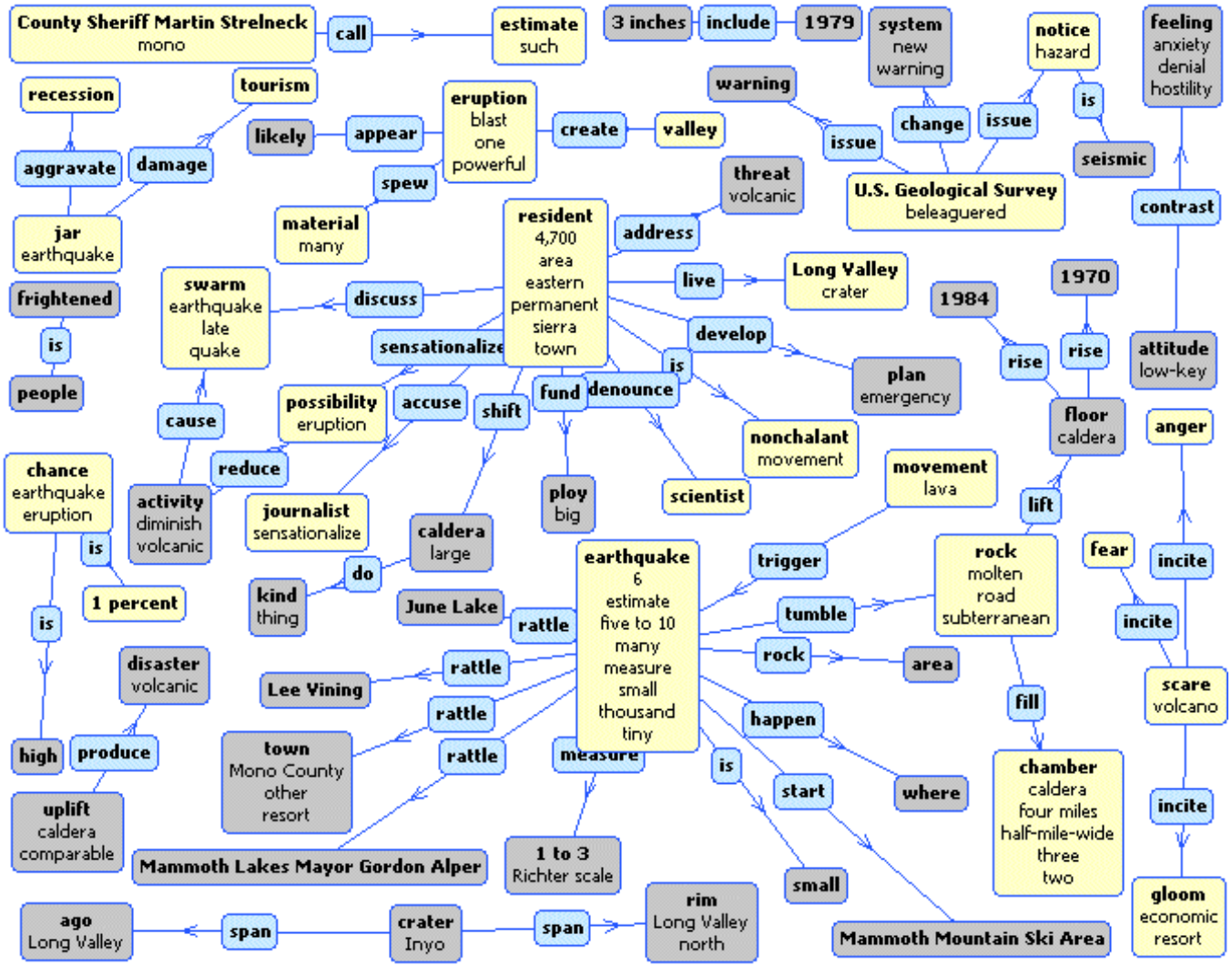
- Two propositions:

```
[EVENT: hold    [AGENT: Unesco] [THEME: meeting]
                [LOCATION: Paris] [TIME: now] ]

[EVENT: devise    [AGENT: Unesco] [THEME: projects] ]
```

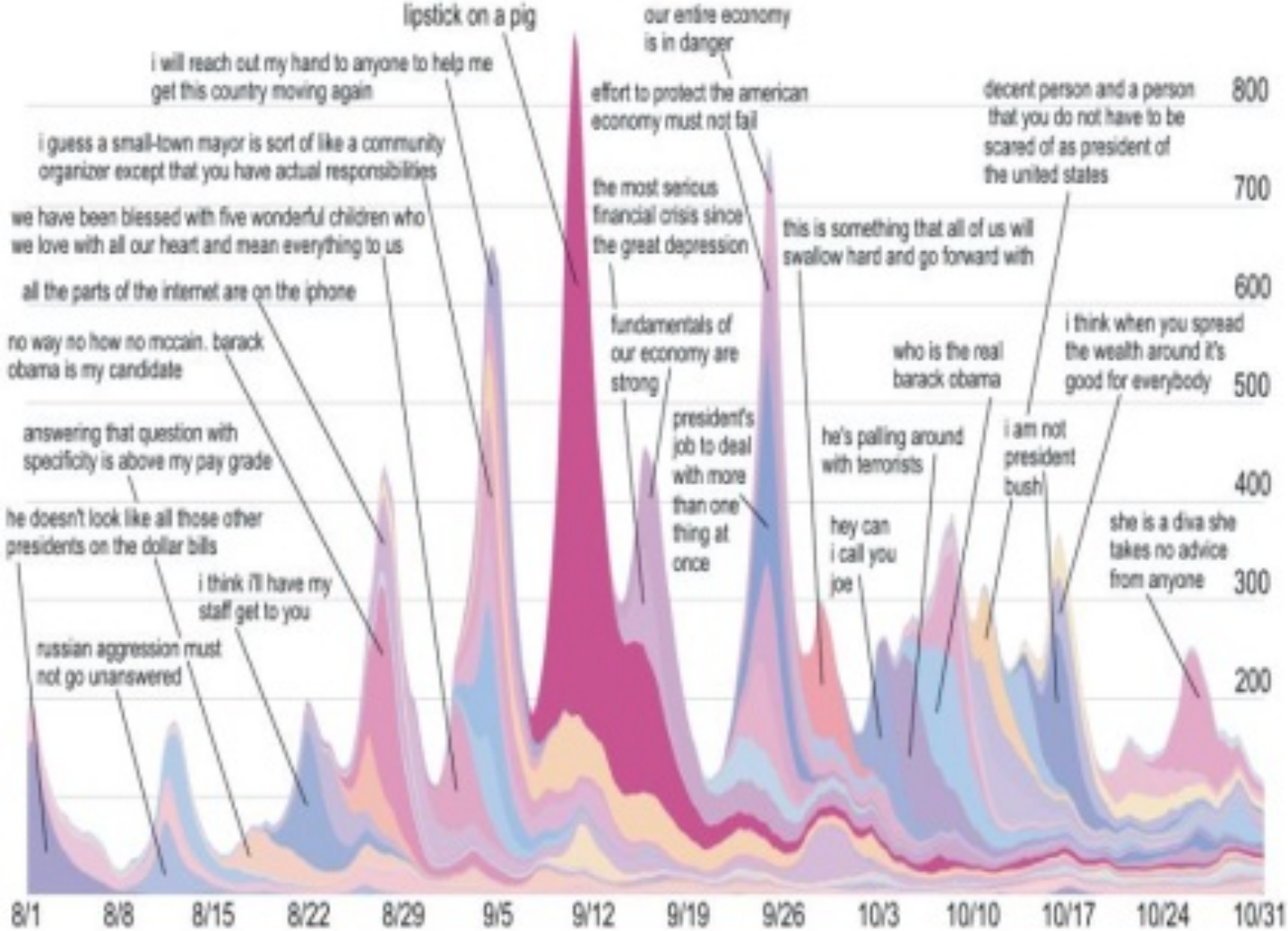
Visualisation of results

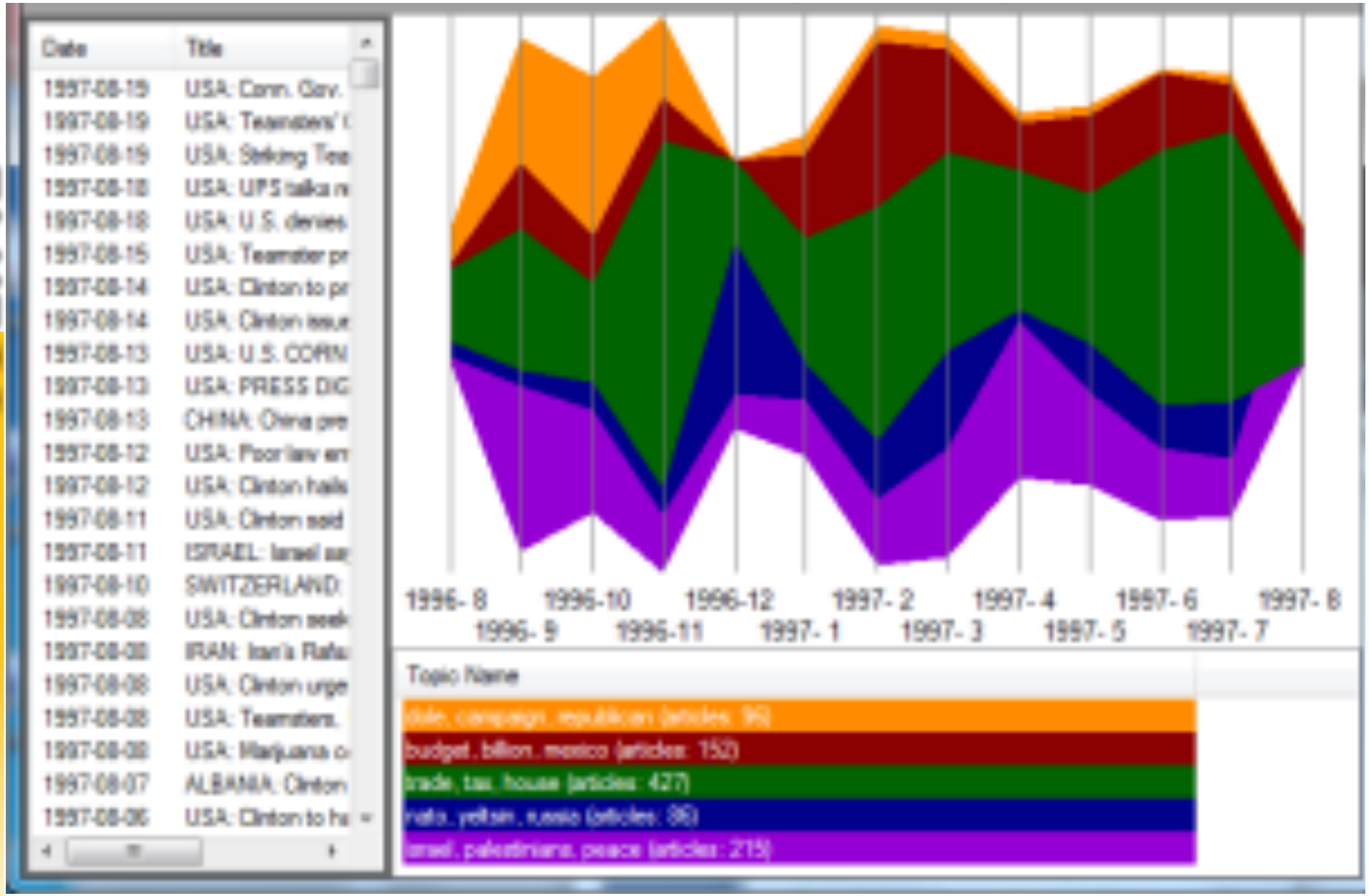
- networks



Visualisation of results

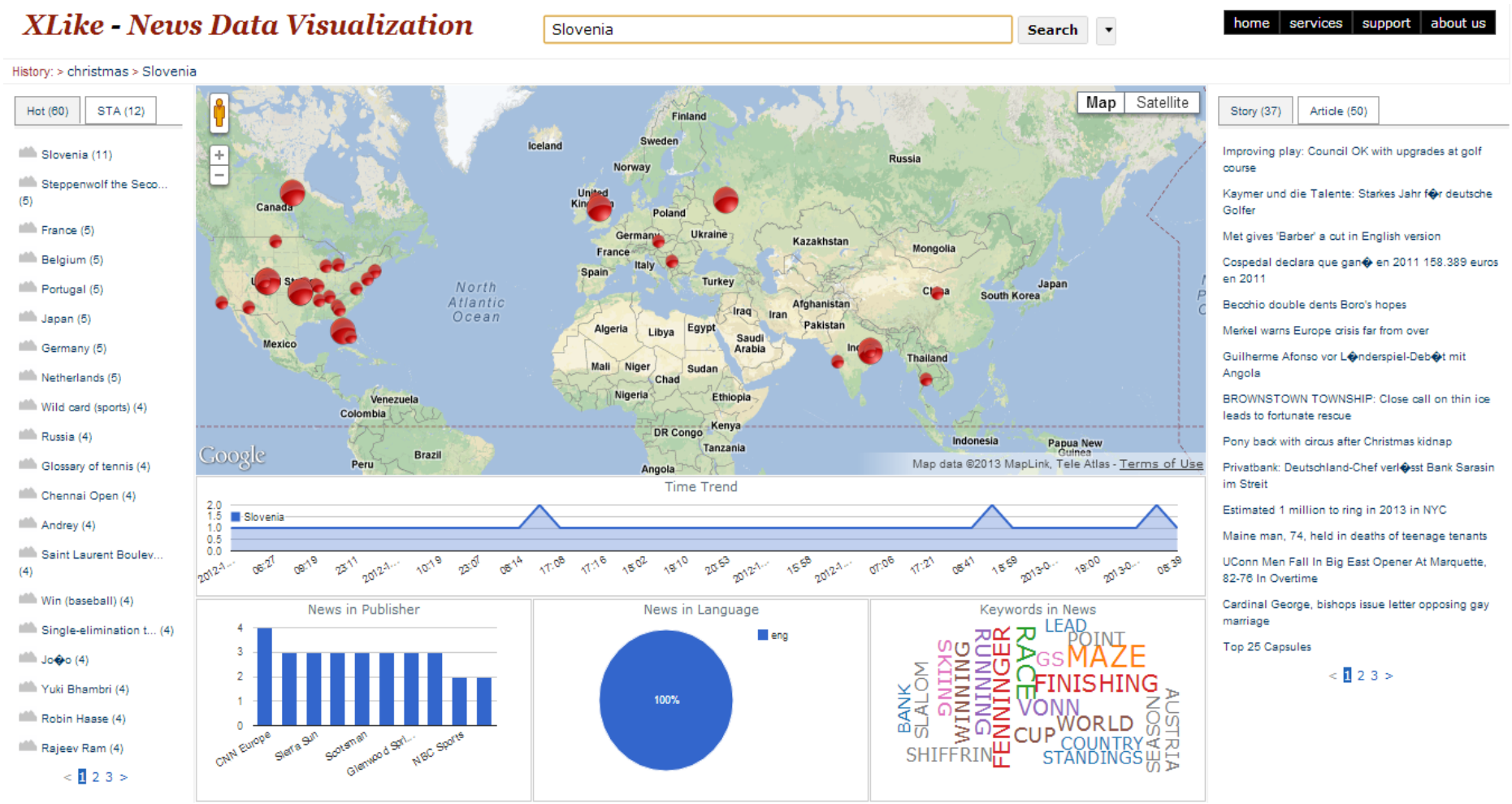
- networks
- graphs





- **timeline mapping of general topics**

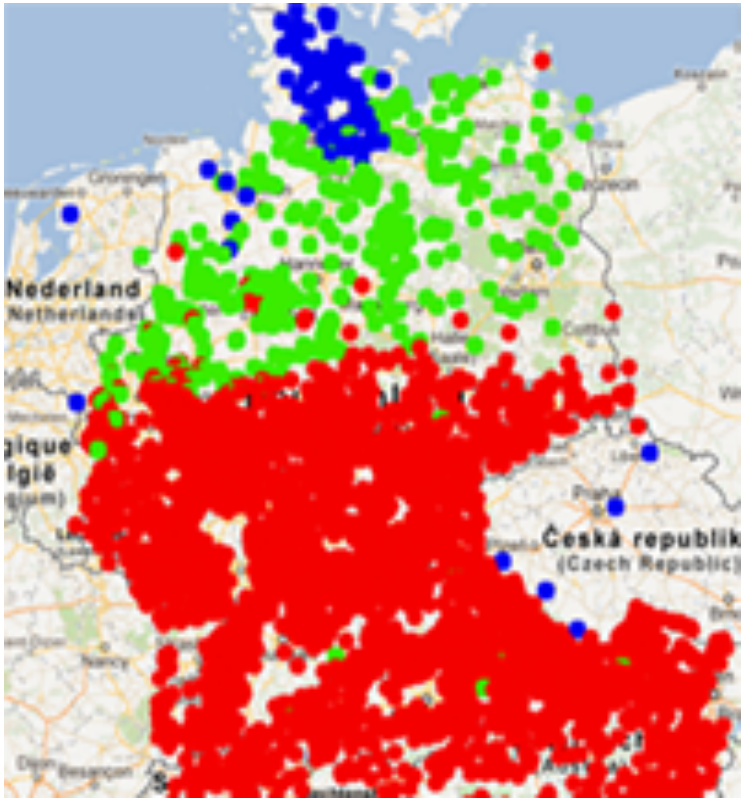
Visualisation of results



- GPS mapping of NEs mentioned (locations, countries,...)

Visualisation of results

- CiNaViz: Visualisation of European City Names
  - location names starting with “Sankt”
  - location names ending in
    - "bach" (red), "beck" (green), "bek" (bek)



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Teksty kultury uczestnictwa
Polish Academy of Sciences, Warsaw, 2013-11-07

CLARA

- Marie Curie ITN
  - training early career researchers for CLARIN-ERIC RI
  - started 2009-12-01, ends 2013-11-30
  - http://clara.b.uib.no