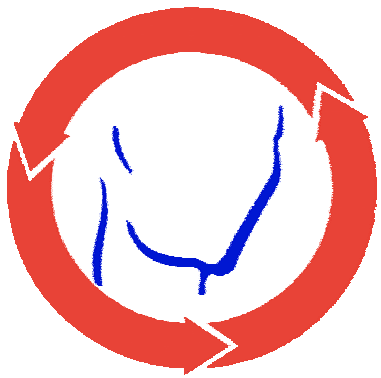
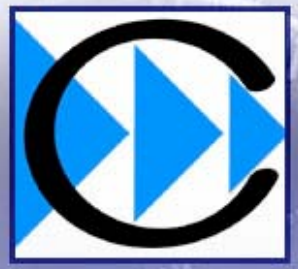
Semantic Markup & Annotation

A Business Case on Web Based Technology

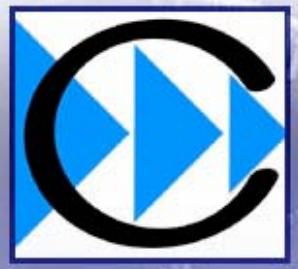


Robert H.P. Engels
Director R&D
CognIT a.s
Norway



This talk

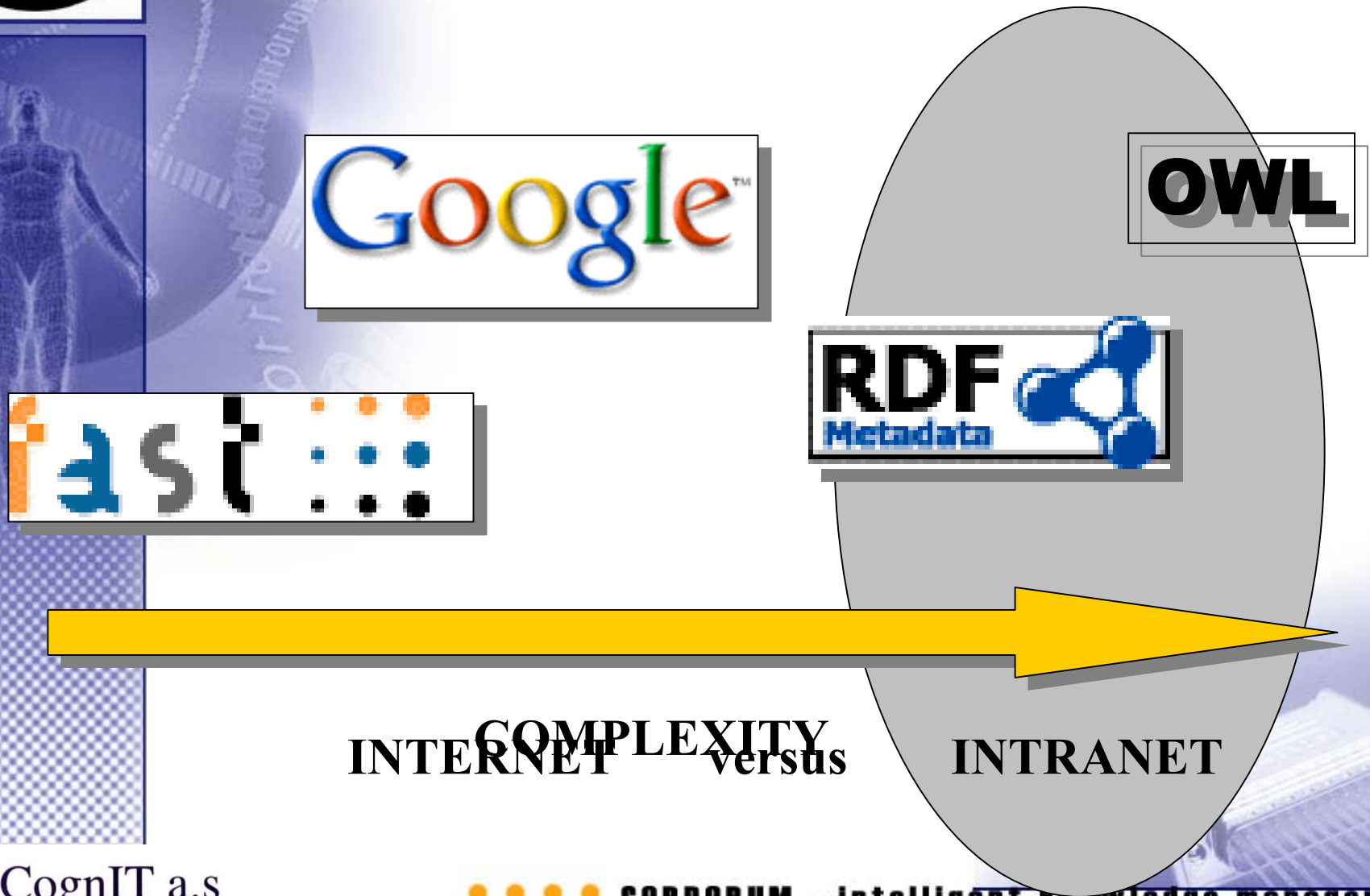
- The need for Semantic Technology
- The Business Case:
  - *Hydro Aluminium and Metal Products Dept.*
- Using it: how to get to your Knowledge
- Technology
  - *Creating Knowledge Bases*
  - *Semantic Based Search & Retrieval*
  - *Summarisation*
  - *Indexing & Categorisation by Agents*
- Using Agents: Business Intelligence
- Conclusion



This talk

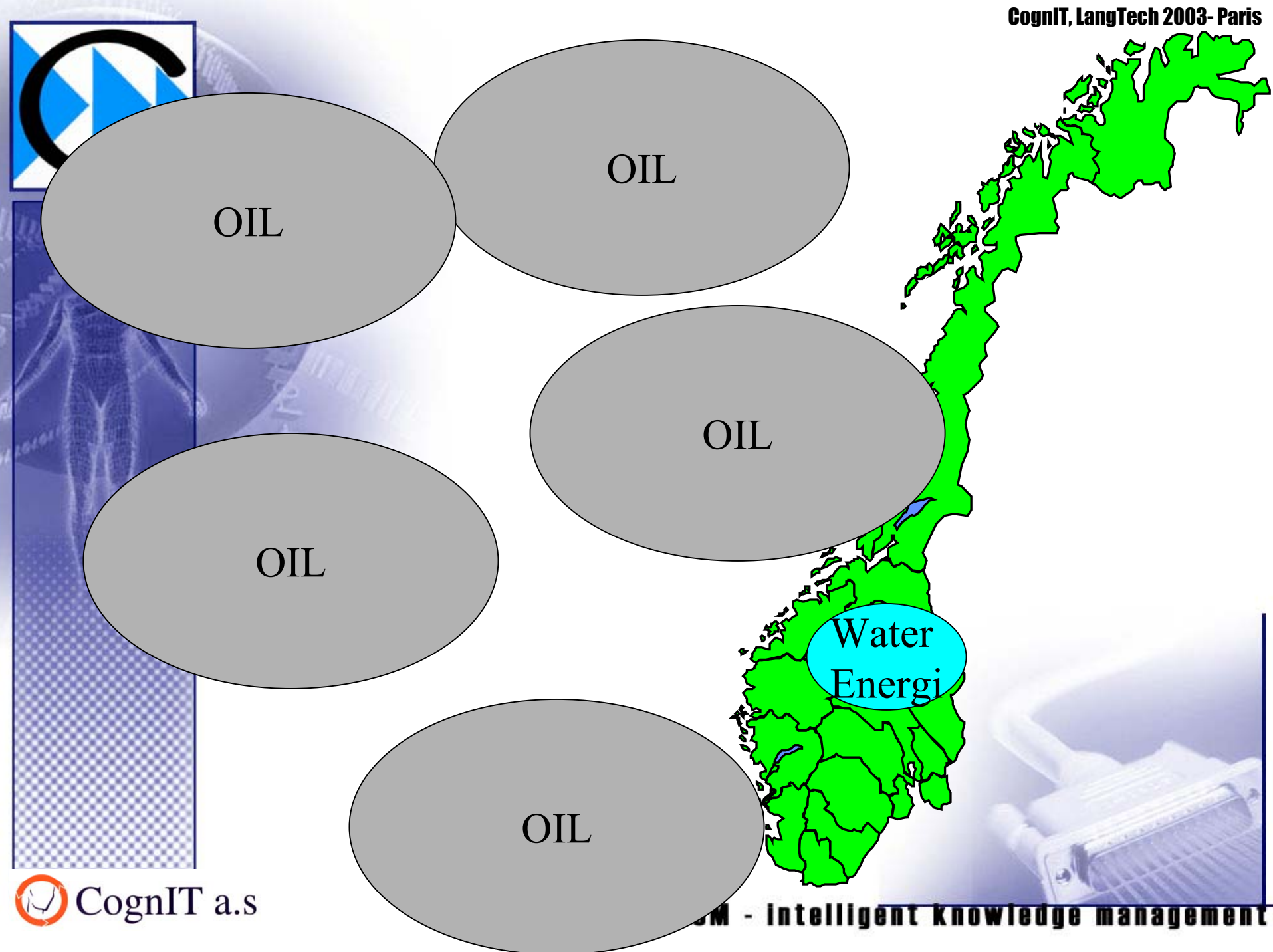
- The need for Semantic Technology
- The Business Case:
  - *Norsk Hydro*
- Using it: how to get to your Knowledge
- Technology
  - *Creating Knowledge Bases*
  - *Semantic Based Search & Retrieval*
  - *Summarisation*
  - *Indexing & Categorisation by Agents*
- Another Use: Business Intelligence
- Conclusion

Semantic Technology
Where is the market?



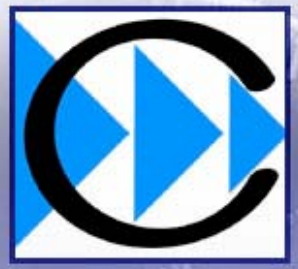
This talk

- The need for Semantic Technology
- The Business Case:
  - *Norsk Hydro*
- Using it: how to get to your Knowledge
- Technology
  - *Creating Knowledge Bases*
  - *Semantic Based Search & Retrieval*
  - *Summarisation*
  - *Indexing & Categorisation by Agents*
- Another Use: Business Intelligence
- Conclusion


OIL
OIL
OIL
OIL
OIL
Water
Energi

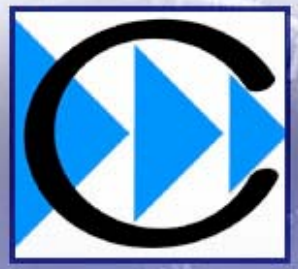
Business Case: Norsk Hydro

- Business Case stems from Aluminium and Metal production Industries
- Aluminium and Metal production in Europe under increasing pressure from low-cost countries (China, Argentinia, etc.)
- Norway might not belong to those countries with the lowest costs
  - » Oslo is 3rd most expensive city on the globe!
  - » Beer (0,5 ltr.): €7-9, Coffee: €4, etc.
- Thus: Industry has focus on Knowledge, Innovation and Management!
  - » Production increasingly ”outsourced”
  - » Knowledge provided and upgraded ”remotely”
- BUT: how to ”manage” this knowledge?



This talk

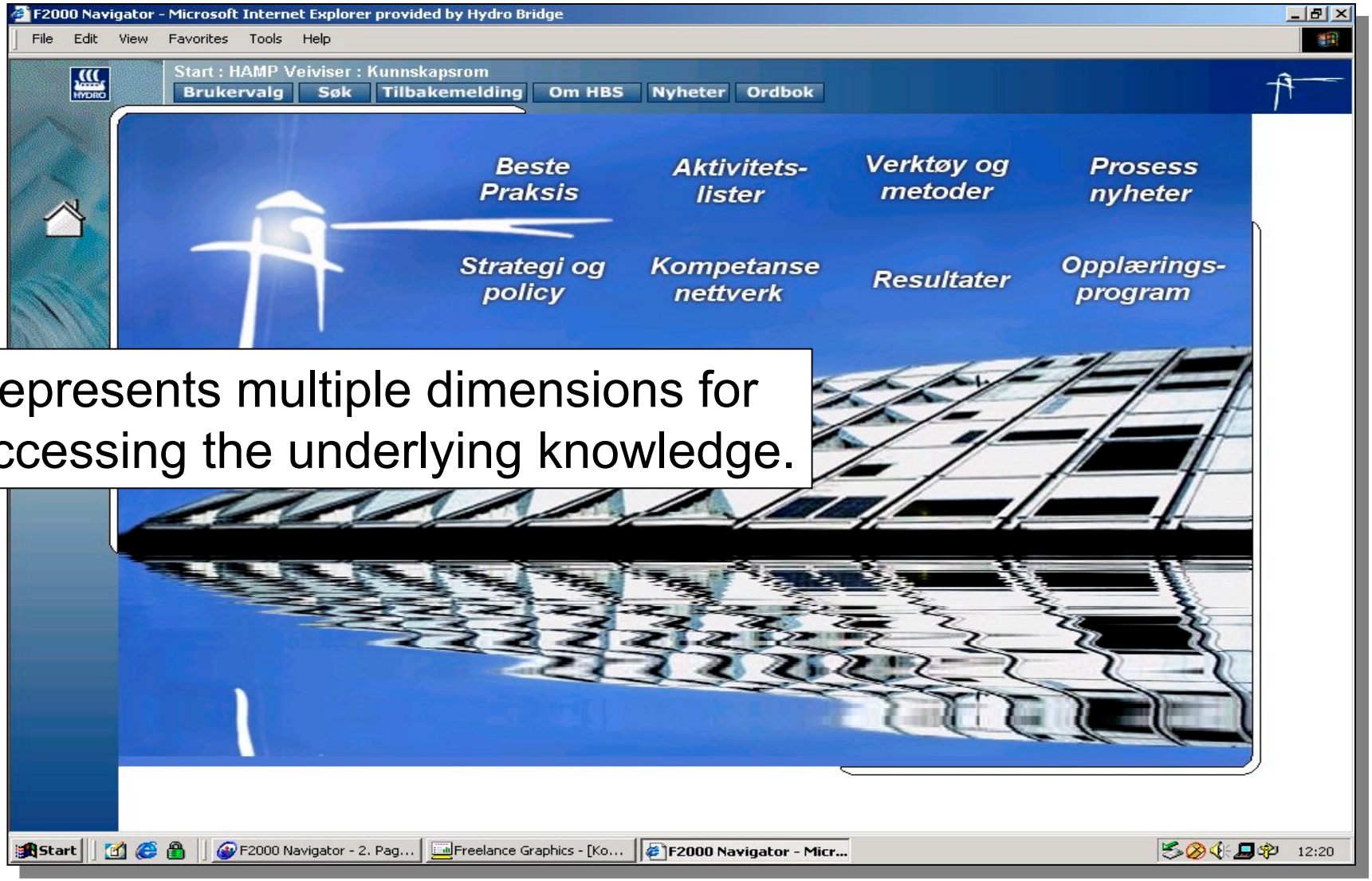
- The need for Semantic Technology
- The Business Case:
  - *Hydro Aluminium and Metal Products Dept.*
- Using it: how to get to your Knowledge!
- Technology
  - *Creating Knowledge Bases*
  - *Semantic Based Search & Retrieval*
  - *Summarisation*
  - *Indexing & Categorisation by Agents*
- Another Use: Business Intelligence
- Conclusion



Where does the Knowledge reside?

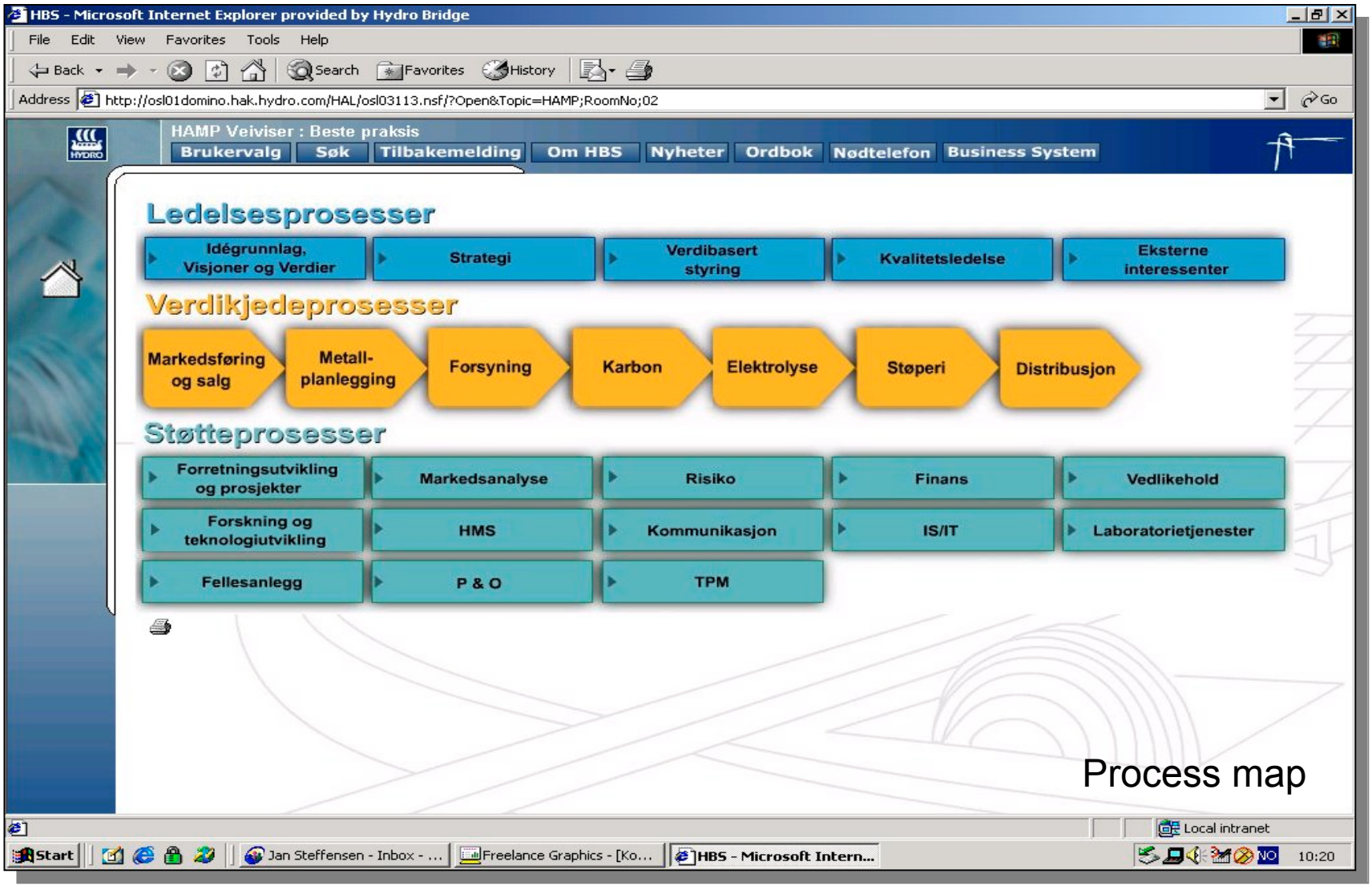
- Knowledge resides in:
  - » Peoples' heads
  - » Letters, emails
  - » Newsgroups, chat/discussion channels
  - » (Semi-) Official Internal Documents
  - » External Documents
  - » Customers/Suppliers
- Most important items:
  - » Entities, Events, Names, Organisations
  - » Numbers, Dates, Tables, Formula's
  - » Graphs, Images
  - » Relations between these items!

Customised Knowledge Room keeps it all together



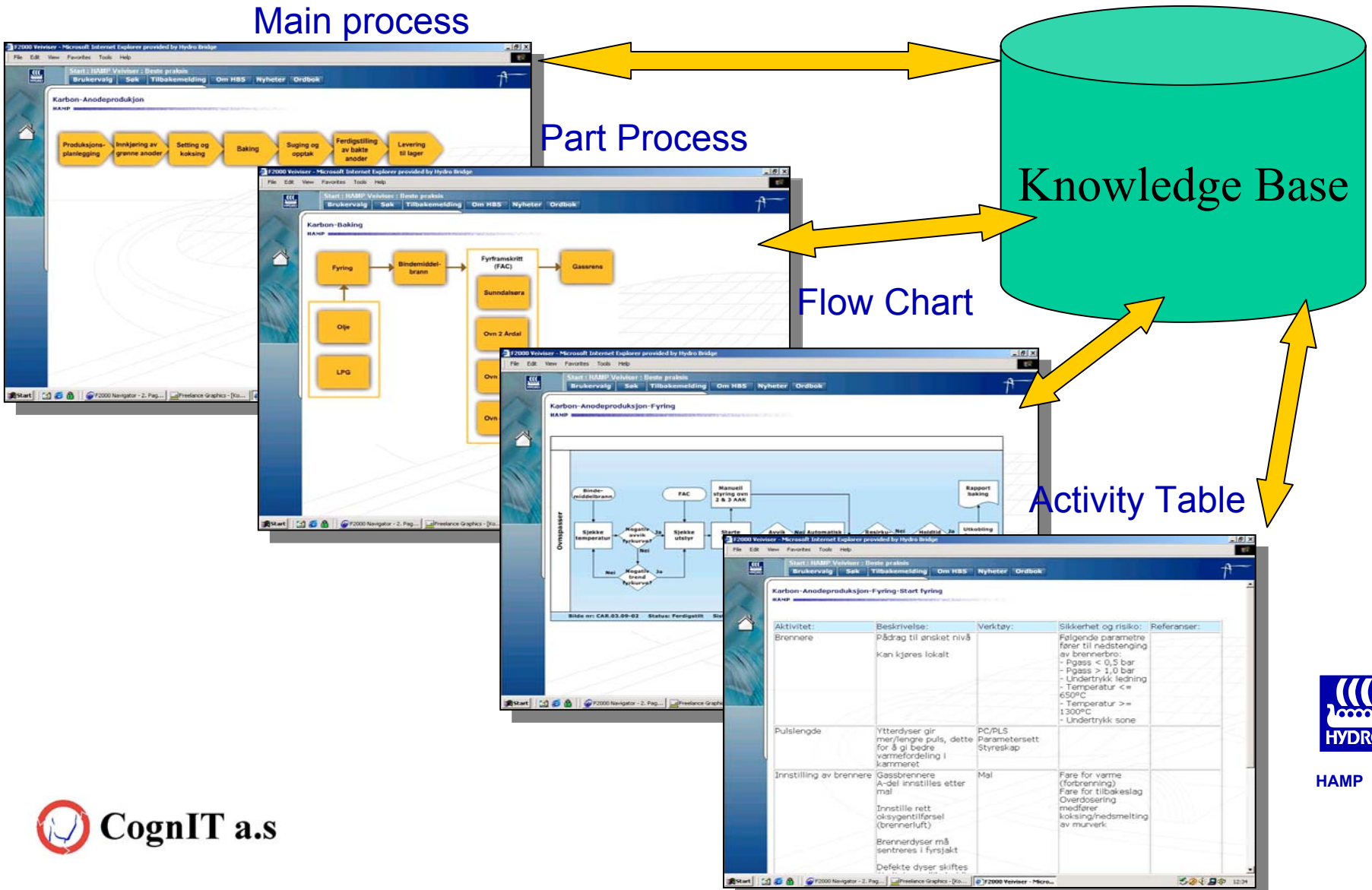
Represents multiple dimensions for accessing the underlying knowledge.

Navigation through Enterprise Business Model



Process map

Business Ontology provides structure as a ”hook” for knowledge



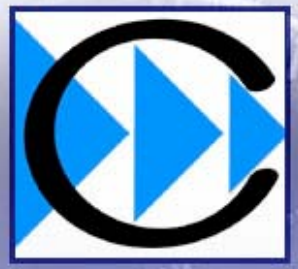
CognIT a.s

HYDRO

HAMP

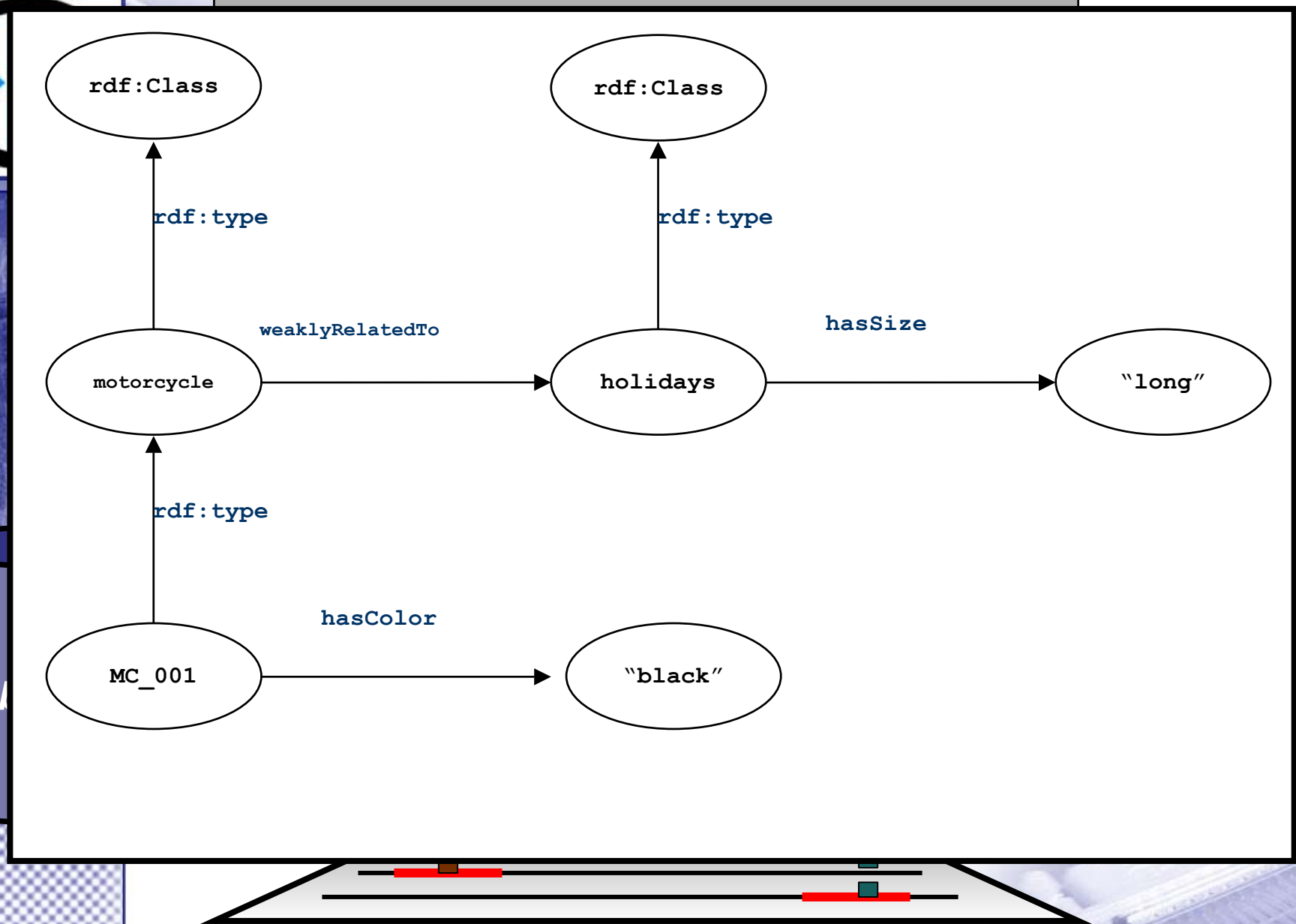
This talk

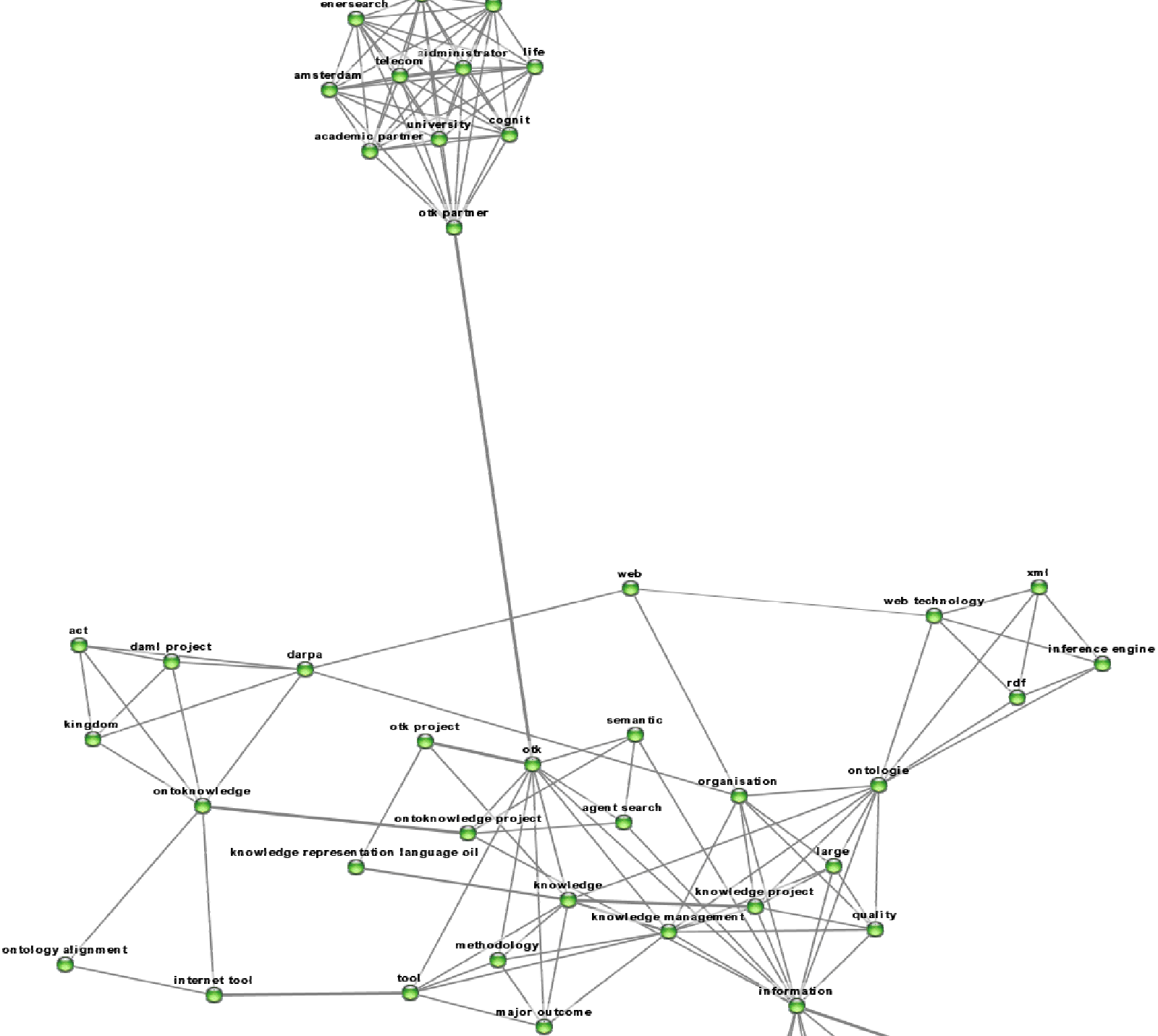
- The need for Semantic Technology
- The Business Case:
  - *Hydro Aluminium and Metal Products Dept.*
- Using it: how to get to your Knowledge
- Technology
  - *Creating Knowledge Bases*
  - *Semantic Based Search & Retrieval*
  - *Summarisation*
  - *Indexing & Categorisation by Agents*
- Another Use: Business Intelligence
- Conclusion

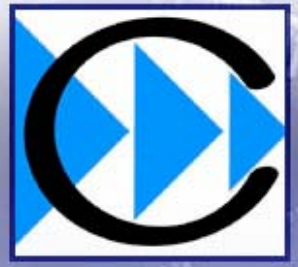


Filling the Knowledge Base

- Semi-Automatic: Categorise Documents using agents:
  - » According to Processes,
  - » Activities,
  - » Roles
  - » Personal or Group Interests
- Automatic: Linguistic analysis of text
  - » Capture semantics
  - » Extract high-value items
  - » Relate!
  - » Generate Summaries, Visualisations etc.
- Represent in RDF/OWL (ideally),
- Store as MetaData in MetaDB for quick reference


rdf:Class
rdf:Class
rdf:type
rdf:type
weaklyRelatedTo
hasSize
motorcycle
holidays
"long"
rdf:type
hasColor
MC_001
"black"

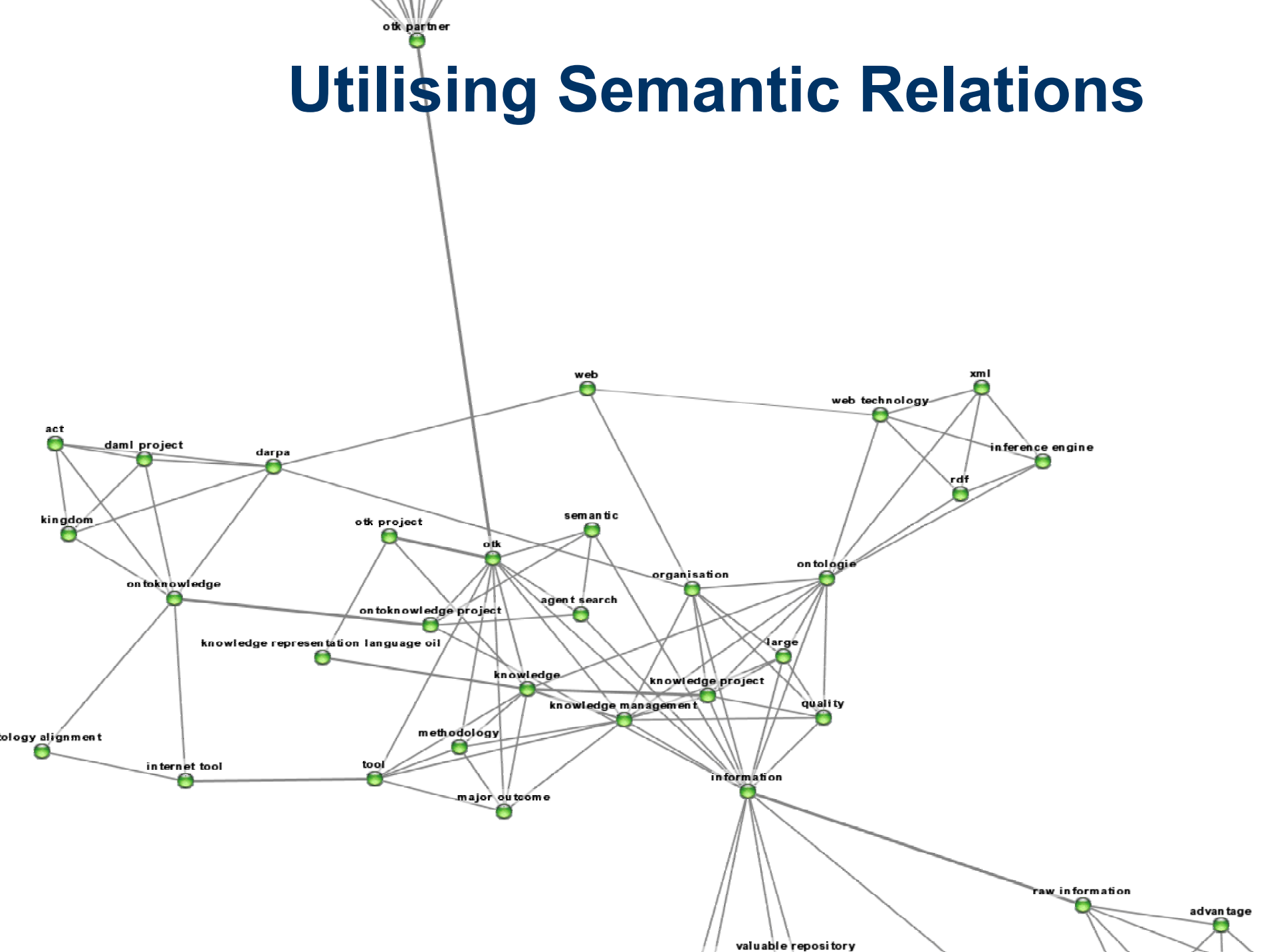

enersearch
administrator
life
telecom
amsterdam
university
cognit
academic partner
otk partner
web
xml
web technology
act
daml project
darpa
inference engine
rdf
kingdom
otk project
semantic
otk
ontologie
organisation
ontoknowledge
agent search
ontoknowledge project
knowledge representation language oil
large
knowledge
knowledge project
knowledge management
quality
ontology alignment
methodology
internet tool
tool
information
major outcome

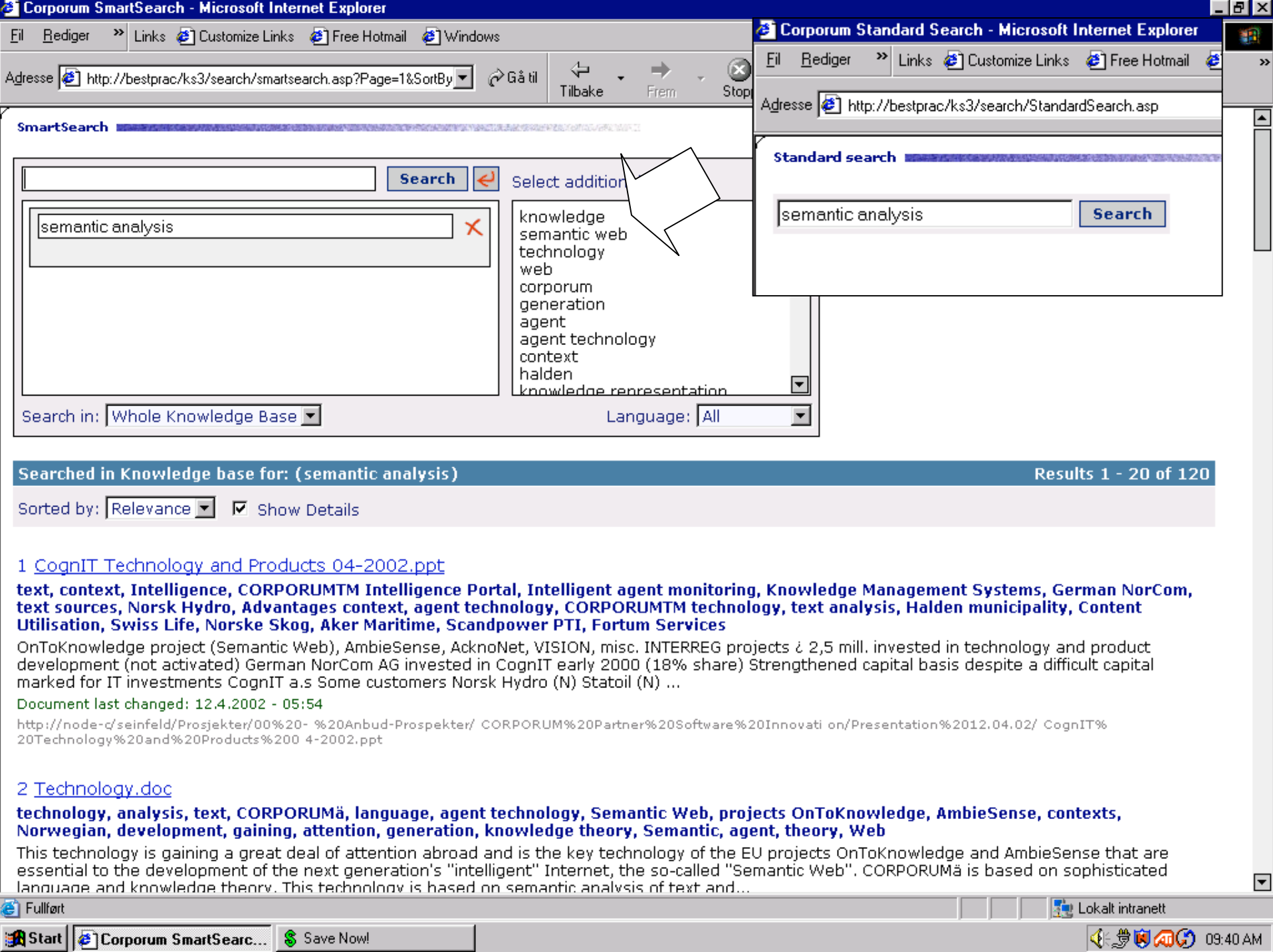


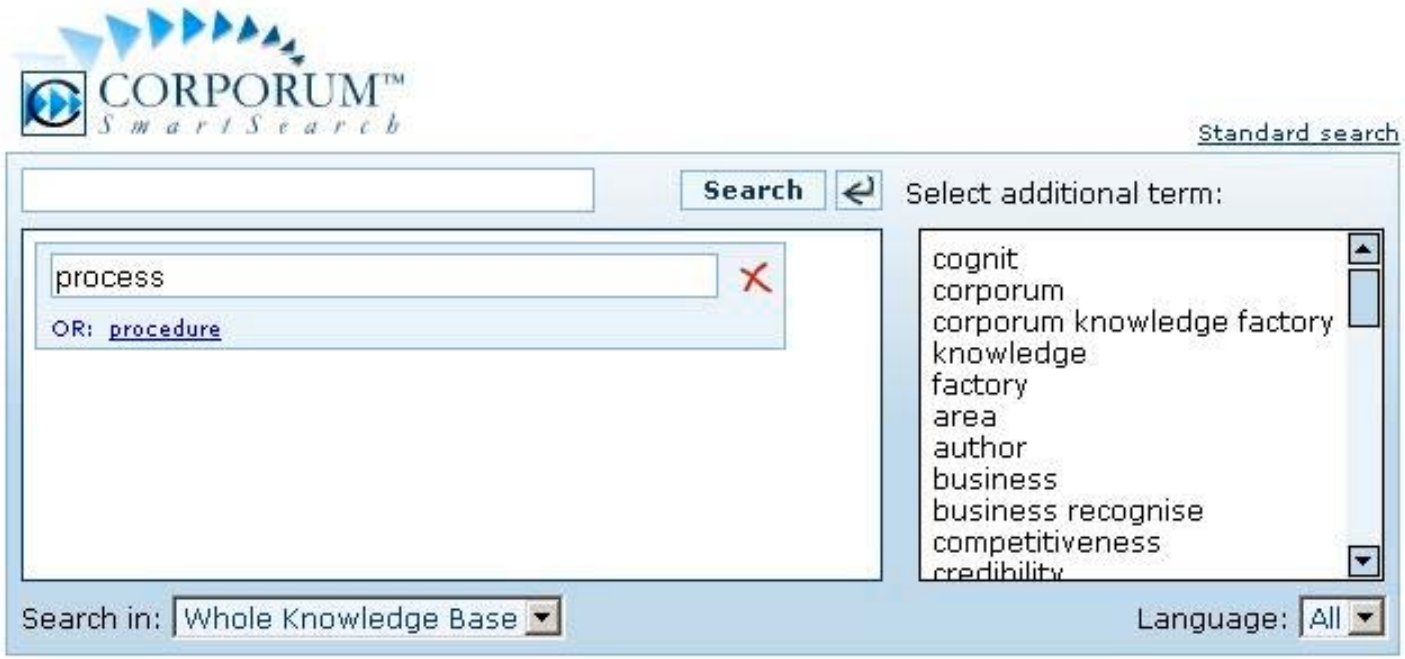
This talk

- The need for Semantic Technology
- The Business Case:
  - *Hydro Aluminium and Metal Products Dept.*
- Using it: how to get to your Knowledge
- Technology
  - *Creating Knowledge Bases*
  - *Semantic Based Search & Retrieval*
  - *Summarisation*
  - *Indexing & Categorisation by Agents*
- Another Use: Business Intelligence
- Conclusion

Utilising Semantic Relations




Corporum SmartSearch - Microsoft Internet Explorer
Fil Rediger Links Customize Links Free Hotmail Windows
Adresse http://bestprac/ks3/search/smartsearch.asp?Page=1&SortBy
Gå til
Tilbake
Frem
Stopp
SmartSearch
Search
Select addition
semantic analysis
knowledge
semantic web
technology
web
corporum
generation
agent
agent technology
context
halden
knowledge representation
Search in: Whole Knowledge Base
Language: All
Searched in Knowledge base for: (semantic analysis)
Results 1 - 20 of 120
Sorted by: Relevance
Show Details
1 CognIT Technology and Products 04-2002.ppt
text, context, Intelligence, CORPORUMTM Intelligence Portal, Intelligent agent monitoring, Knowledge Management Systems, German NorCom, text sources, Norsk Hydro, Advantages context, agent technology, CORPORUMTM technology, text analysis, Halden municipality, Content Utilisation, Swiss Life, Norske Skog, Aker Maritime, Scandpower PTI, Fortum Services
OnToKnowledge project (Semantic Web), AmbieSense, AcknoNet, VISION, misc. INTERREG projects ¿ 2,5 mill. invested in technology and product development (not activated) German NorCom AG invested in CognIT early 2000 (18% share) Strengthened capital basis despite a difficult capital marked for IT investments CognIT a.s Some customers Norsk Hydro (N) Statoil (N) ...
Document last changed: 12.4.2002 - 05:54
http://node-c/seinfeld/Prosjekter/00%20- %20Anbud-Prospekter/ CORPORUM%20Partner%20Software%20Innovati on/Presentation%2012.04.02/ CognIT%20Technology%20and%20Products%200 4-2002.ppt
2 Technology.doc
technology, analysis, text, CORPORUMä, language, agent technology, Semantic Web, projects OnToKnowledge, AmbieSense, contexts, Norwegian, development, gaining, attention, generation, knowledge theory, Semantic, agent, theory, Web
This technology is gaining a great deal of attention abroad and is the key technology of the EU projects OnToKnowledge and AmbieSense that are essential to the development of the next generation's "intelligent" Internet, the so-called "Semantic Web". CORPORUMä is based on sophisticated language and knowledge theory. This technology is based on semantic analysis of text and...
Corporum Standard Search - Microsoft Internet Explorer
Fil Rediger Links Customize Links Free Hotmail
Adresse http://bestprac/ks3/search/StandardSearch.asp
Standard search
semantic analysis
Search
Fullført
Lokalt intranett
Start
Corporum SmartSearc...
Save Now!
09:40 AM



Searched in Knowledge base for: **(process)**

Results 1 - 2 of 2

Sorted by: Relevance ☑ Show Details

1. CognIT a.s - Detailed description (Document last changed: 28.5.2003 - 13:01)

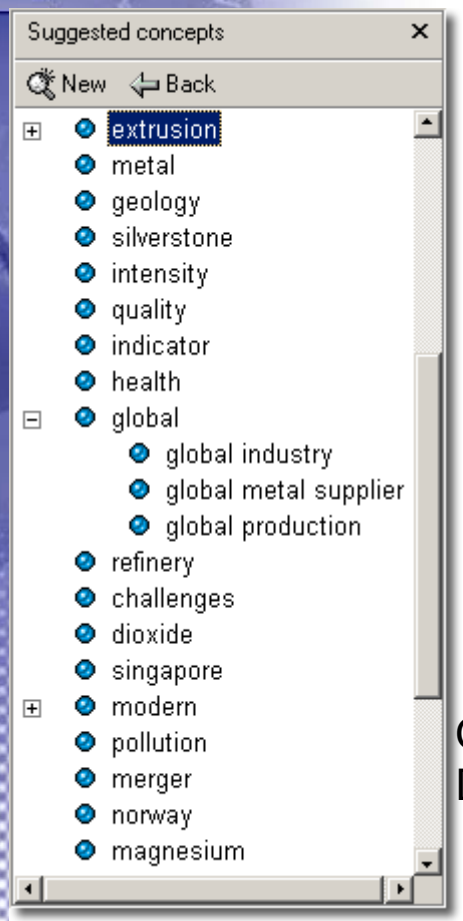
CognIT a.s Author: CognIT a.s CognIT a.s - Detailed description Detailed description of the CORPORUM Knowledge Factory CORPORUM Knowledge Factory - the shortcut to ISO 9000 Certification The ISO 9000 series of quality...

CORPORUM Knowledge Factory, Knowledge, ISO Certification, Centralising, CognIT, process, CORPORUM, Practice procedures, Enhancing competitiveness, European clients, businesses recognise, clients, Giving, credibility, areas, efficiency, Helping, chains, success, Connecting

http://www.cognit.no/home_multi/html/ index.asp?SideID=300

CONCEPT BROWSING

Also COMPLEX Concepts



While browsing the concepts, the user can select generic concepts like :

"global"

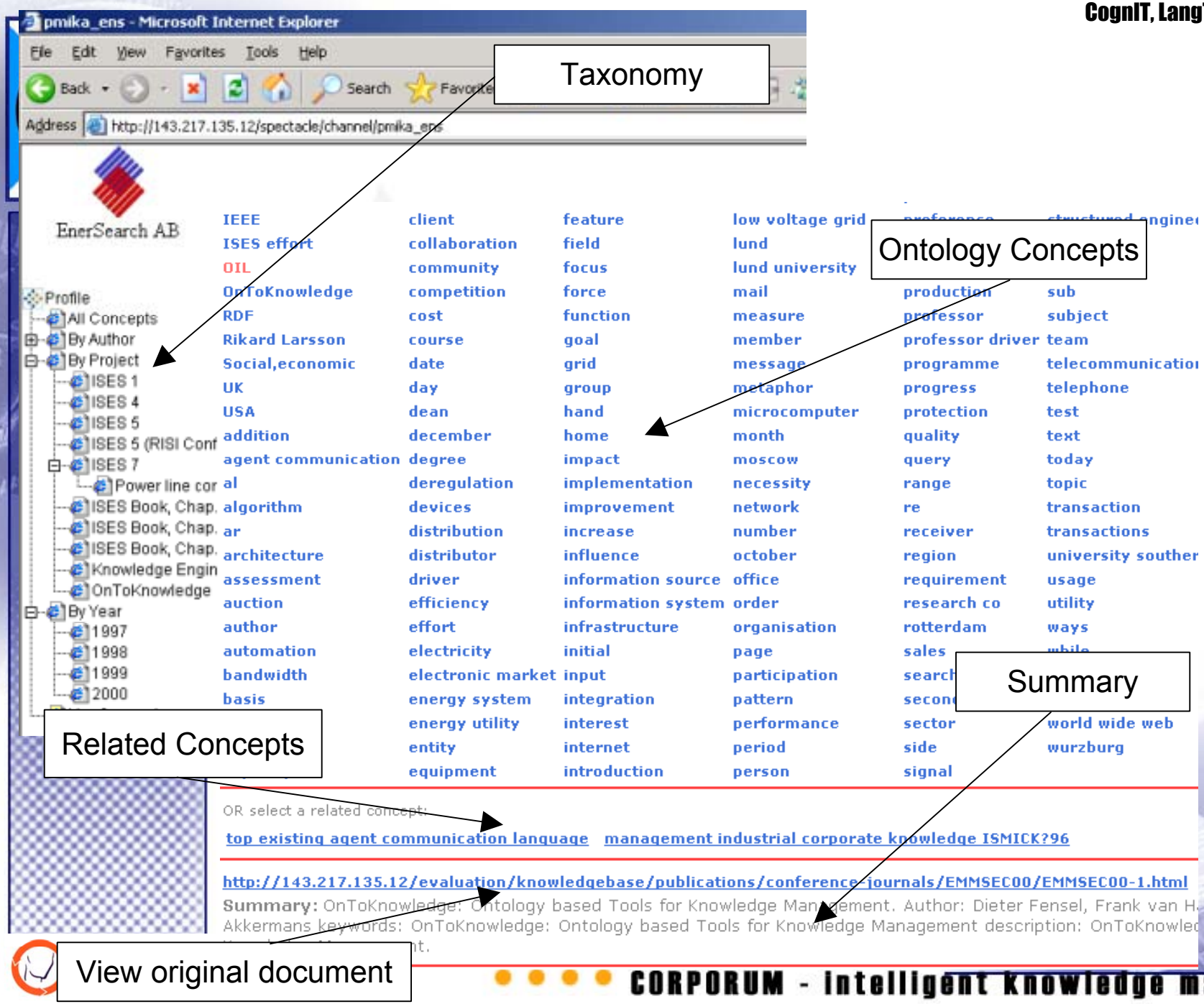
as well as more specific concepts like :

"global industry"

"global metal supplier"

"global production"

Generated by the system based on available content.
Defines excellent subject indexes and table of contents.

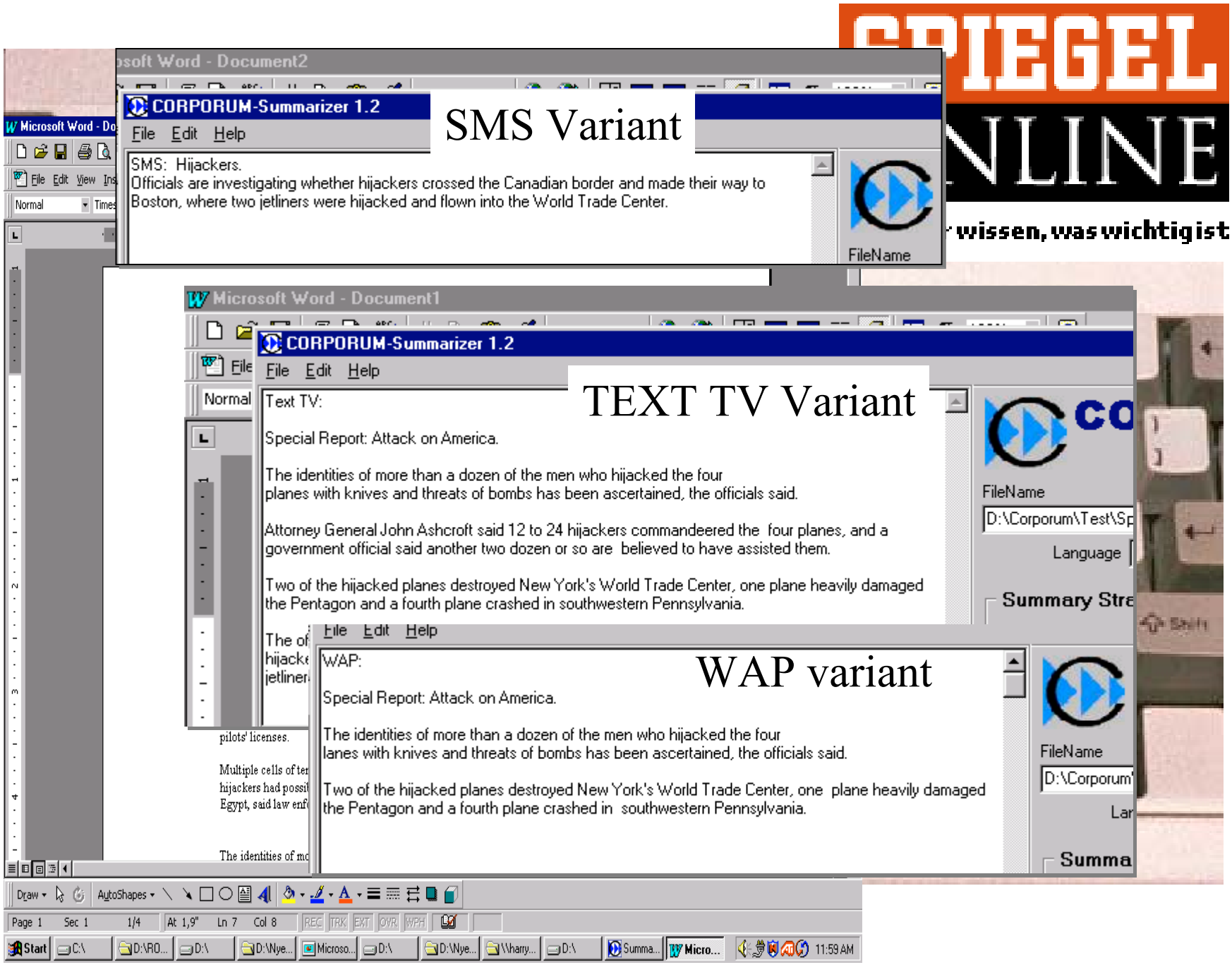

pmika_ens - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://143.217.135.12/spectacle/channel/pmika_ens
EnerSearch AB
Taxonomy
Ontology Concepts
Summary
Related Concepts
View original document
Profile
All Concepts
By Author
By Project
ISES 1
ISES 4
ISES 5
ISES 5 (RISI Conf
ISES 7
Power line cor
ISES Book, Chap.
ISES Book, Chap.
ISES Book, Chap.
Knowledge Engin
OnToKnowledge
By Year
1997
1998
1999
2000
IEEE
ISES effort
OIL
OnToKnowledge
RDF
Rikard Larsson
Social,economic
UK
USA
addition
agent communication
al
algorithm
ar
architecture
assessment
auction
author
automation
bandwidth
basis
client
collaboration
community
competition
cost
course
date
day
dean
december
degree
deregulation
devices
distribution
distributor
driver
efficiency
effort
electricity
electronic market
energy system
energy utility
entity
equipment
feature
field
focus
force
function
goal
grid
group
hand
home
impact
implementation
improvement
increase
influence
information source
information system
infrastructure
initial
input
integration
interest
internet
introduction
low voltage grid
lund
lund university
mail
measure
member
message
metaphor
microcomputer
month
moscow
necessity
network
number
october
office
order
organisation
page
participation
pattern
performance
period
person
production
professor
professor driver
programme
progress
protection
quality
query
range
re
receiver
region
requirement
research co
rotterdam
sales
sector
side
signal
sub
subject
team
telecommunicatio
telephone
test
text
today
topic
transaction
transactions
university souther
usage
utility
ways
world wide web
wurzburg
OR select a related concept:
top existing agent communication language
management industrial corporate knowledge ISMICK?96
http://143.217.135.12/evaluation/knowledgebase/publications/conference-journals/EMMSEC00/EMMSEC00-1.html
Summary: OnToKnowledge: Ontology based Tools for Knowledge Management. Author: Dieter Fensel, Frank van H
Akkermans keywords: OnToKnowledge: Ontology based Tools for Knowledge Management description: OnToKnowled

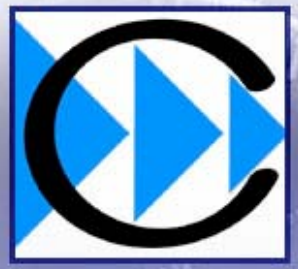
finding, discovery & learning

Publications by D. Healey on liberalisation

This talk

- The need for Semantic Technology
- The Business Case:
  - *Hydro Aluminium and Metal Products Dept.*
- Using it: how to get to your Knowledge
- Technology
  - *Creating Knowledge Bases*
  - *Semantic Based Search & Retrieval*
  - *Summarisation*
  - *Indexing & Categorisation by Agents*
- Another Use: Business Intelligence
- Conclusion


SPIEGEL
NLINE
wissen, was wichtig ist
Microsoft Word - Document2
CORPORUM-Summarizer 1.2
File Edit Help
SMS Variant
SMS: Hijackers.
Officials are investigating whether hijackers crossed the Canadian border and made their way to Boston, where two jetliners were hijacked and flown into the World Trade Center.
FileName
Microsoft Word - Document1
CORPORUM-Summarizer 1.2
File Edit Help
TEXT TV Variant
Text TV:
Special Report: Attack on America.
The identities of more than a dozen of the men who hijacked the four planes with knives and threats of bombs has been ascertained, the officials said.
Attorney General John Ashcroft said 12 to 24 hijackers commandeered the four planes, and a government official said another two dozen or so are believed to have assisted them.
Two of the hijacked planes destroyed New York's World Trade Center, one plane heavily damaged the Pentagon and a fourth plane crashed in southwestern Pennsylvania.
FileName
D:\Corporum\Test\Sp
Language
Summary Stra
File Edit Help
WAP variant
WAP:
Special Report: Attack on America.
The identities of more than a dozen of the men who hijacked the four planes with knives and threats of bombs has been ascertained, the officials said.
Two of the hijacked planes destroyed New York's World Trade Center, one plane heavily damaged the Pentagon and a fourth plane crashed in southwestern Pennsylvania.
FileName
D:\Corporum
Summa
pilots' licenses.
Multiple cells of ter
hijackers had possi
Egypt, said law enf
The identities of mo
Draw AutoShapes
Page 1 Sec 1 1/4 At 1,9" Ln 7 Col 8
Start C:\ D:\RO... D:\ D:\Nye... Microso... D:\ D:\Nye... \\harry... D:\ Summa... Micro... 11:59 AM



This talk

- The need for Semantic Technology
- The Business Case:
  - *Hydro Aluminium and Metal Products Dept.*
- Using it: how to get to your Knowledge
- Technology
  - *Creating Knowledge Bases*
  - *Semantic Based Search & Retrieval*
  - *Summarisation*
  - *Indexing & Categorisation by Agents*
- Another Use: Business Intelligence
- Conclusion

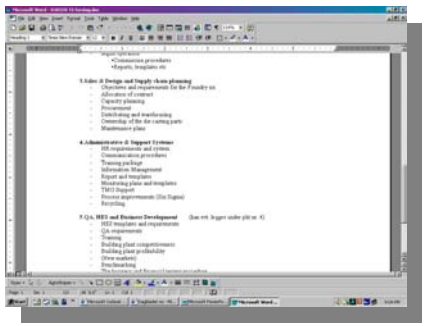
Where do you want to go today, Mister Anderson?

Intelligent agents

Updates

Missions

End-User Tool



Editor, portal, news feed

Interest models and crawler targets defined according to specific *long-term* interest

Agents

Agents

Document system

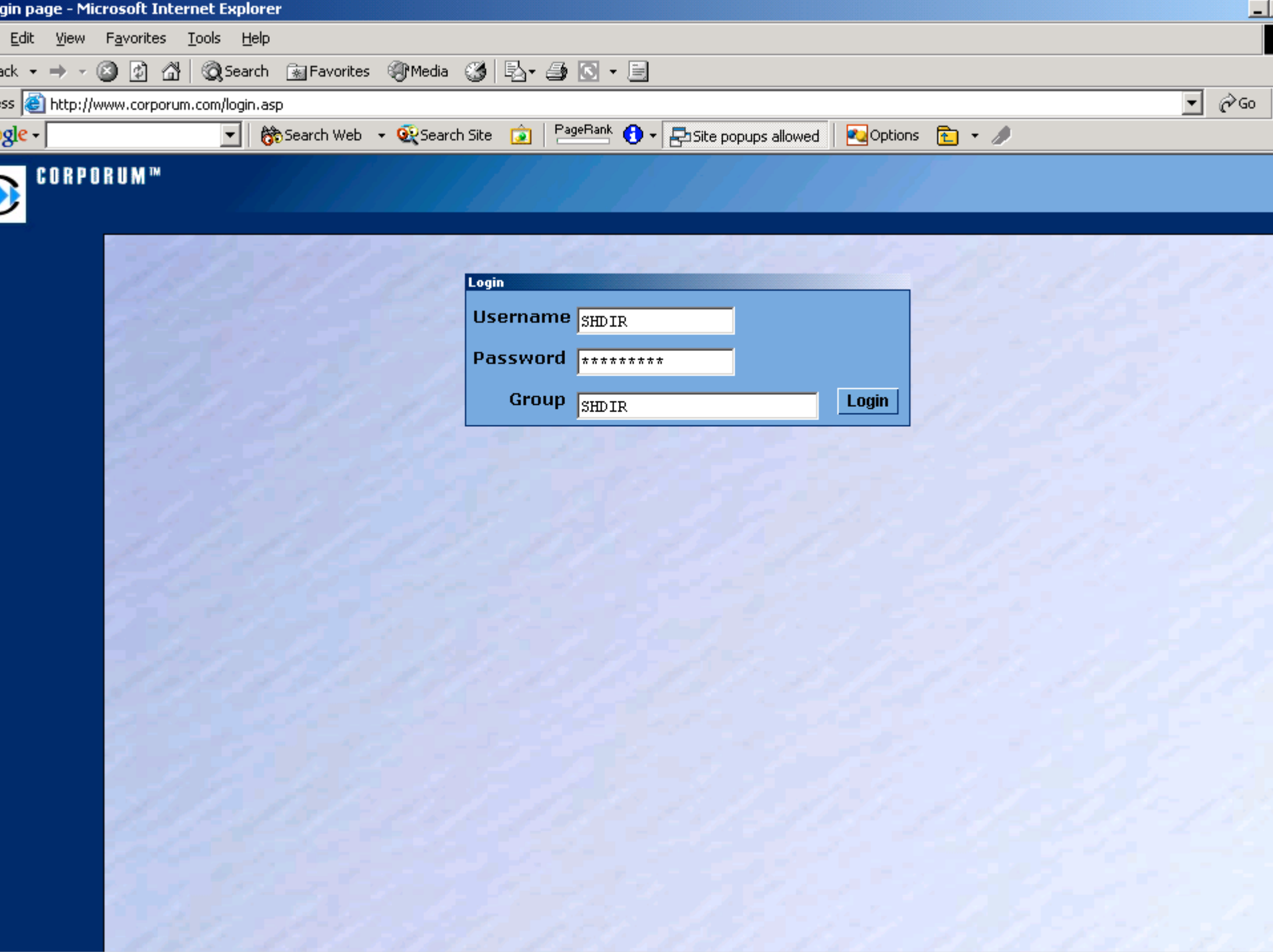
File system

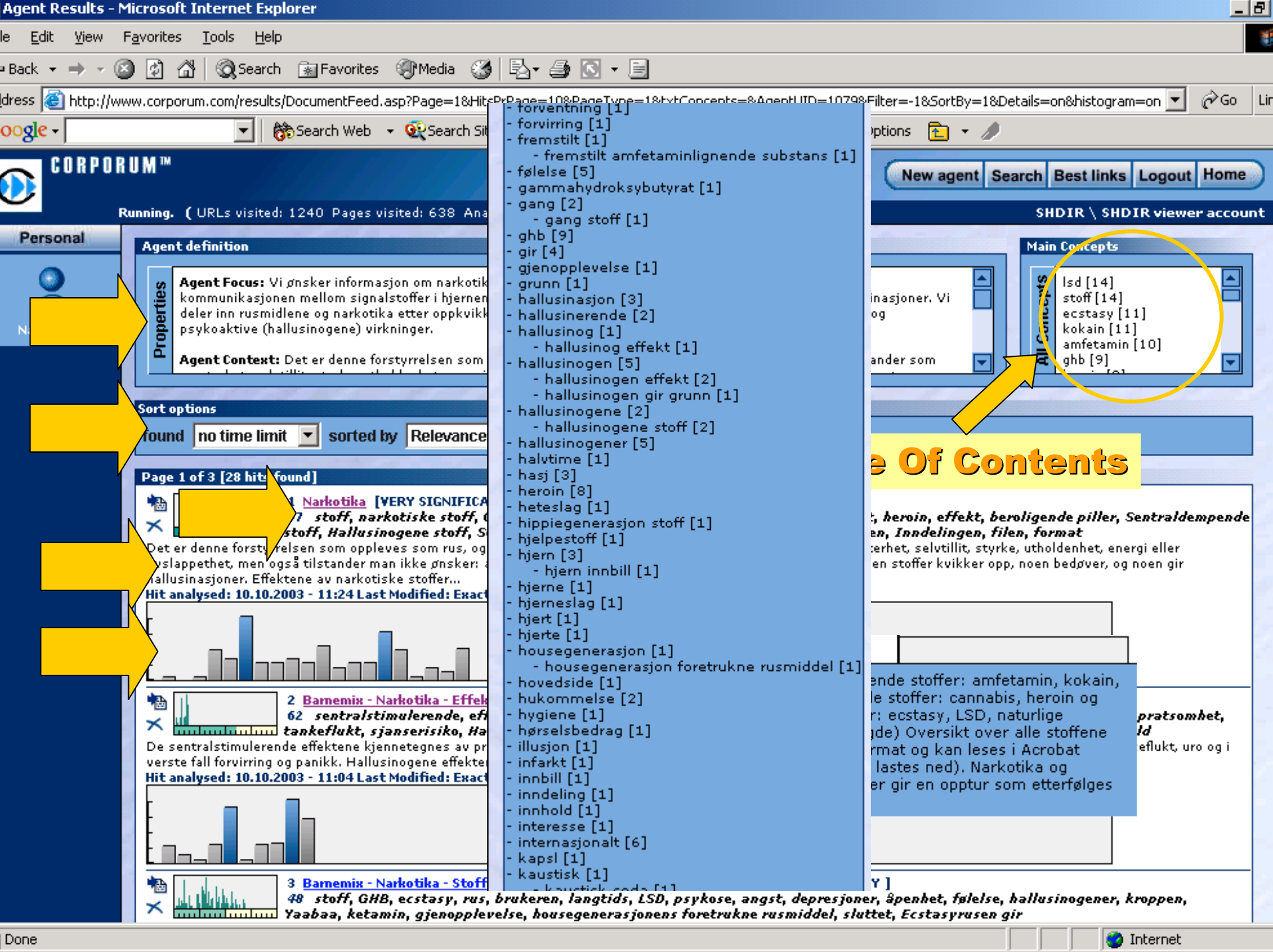
Portal input

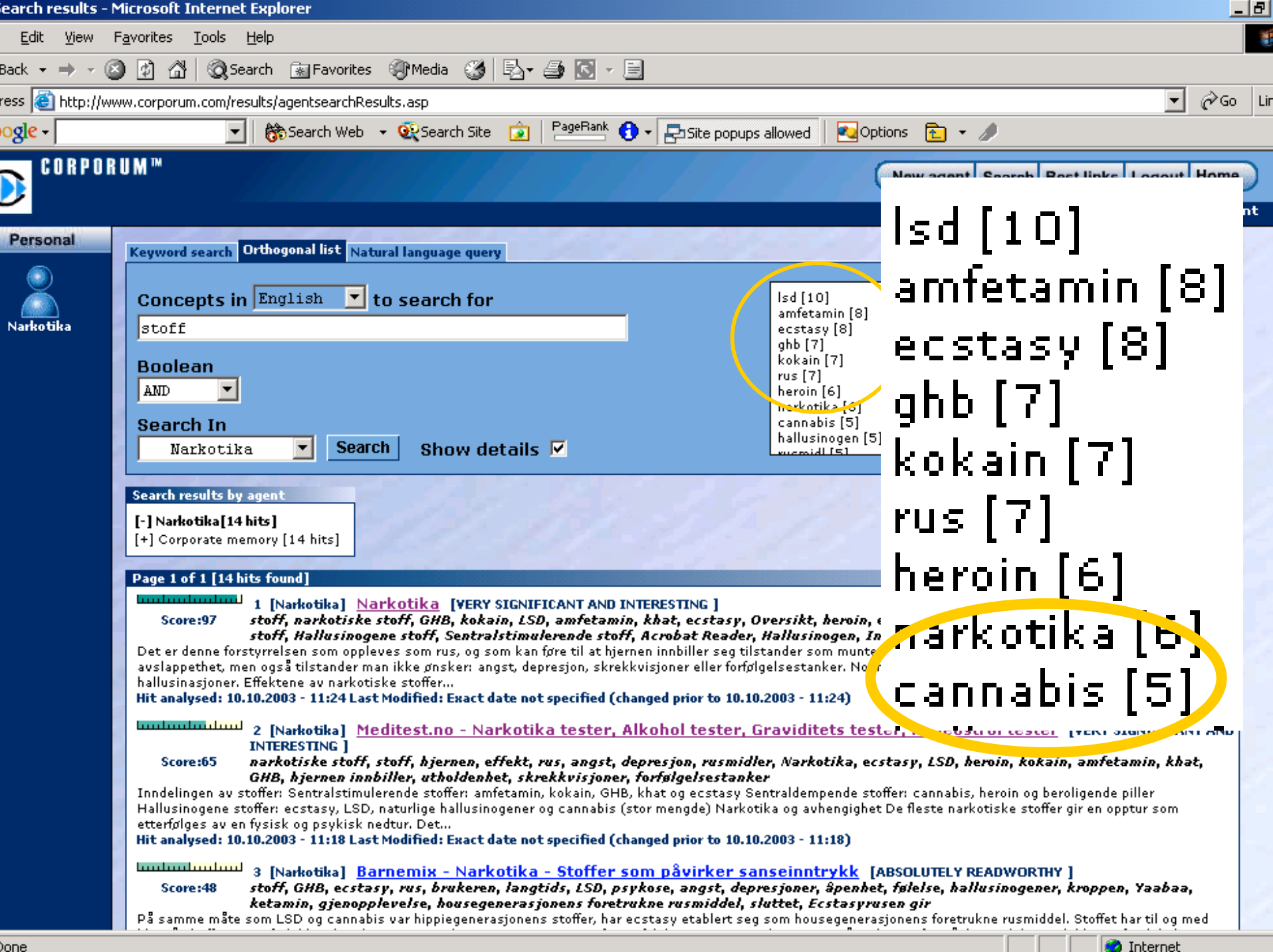
Crawlers

WWW portals, news, online databases

Back-end responsible or analyst


gin page - Microsoft Internet Explorer
Edit View Favorites Tools Help
Search Favorites Media
http://www.corporum.com/login.asp
Go
Search Web Search Site PageRank Site popups allowed Options
CORPORUM™
Login
Username SHDIR
Password *********
Group SHDIR
Login


Agent Results - Microsoft Internet Explorer
CORPORUM™
New agent
Search
Best links
Logout
Home
Running. (URLs visited: 1240 Pages visited: 638
SHDIR \ SHDIR viewer account
Personal
Agent definition
Properties
Agent Focus: Vi ønsker informasjon om narkotik
kommunikasjonen mellom signalstoffer i hjernen
deler inn rusmidlene og narkotika etter oppkvikk
psykoaktive (hallusinogene) virkninger.
Agent Context: Det er denne forstyrrelsen som
Main Concepts
lsd [14]
stoff [14]
ecstasy [11]
kokain [11]
amfetamin [10]
ghb [9]
Sort options
found
no time limit
sorted by
Relevance
Page 1 of 3 [28 hits found]
Narkotika [VERY SIGNIFICA
Det er denne forstyrrelsen som oppleves som rus, og
avslappethet, men også tilstander man ikke ønsker:
hallusinasjoner. Effektene av narkotiske stoffer...
Hit analysed: 10.10.2003 - 11:24 Last Modified: Exact
2 Barnemix - Narkotika - Effek
62 sentralstimulerende, ef
tankeflukt, sjanserisiko, Ha
De sentralstimulerende effektene kjennetegnes av pr
verste fall forvirring og panikk. Hallusinogene effekte
Hit analysed: 10.10.2003 - 11:04 Last Modified: Exact
3 Barnemix - Narkotika - Stoff
48 stoff, GHB, ecstasy, rus, brukeren, langtids, LSD, psykose, angst, depresjoner, åpenhet, følelse, hallusinogener, kroppen,
Yaabaa, ketamin, gjenopplevelse, housegenerasjonens foretrukne rusmiddel, sluttet, Ecstasyrusen gir
- forventning [1]
- forvirring [1]
- fremstilt [1]
- fremstilt amfetaminlignende substans [1]
- følelse [5]
- gammahydroksybutyrat [1]
- gang [2]
- gang stoff [1]
- ghb [9]
- gir [4]
- gjenopplevelse [1]
- grunn [1]
- hallusinasjon [3]
- hallusinerende [2]
- hallusinog [1]
- hallusinog effekt [1]
- hallusinogen [5]
- hallusinogen effekt [2]
- hallusinogen gir grunn [1]
- hallusinogene [2]
- hallusinogene stoff [2]
- hallusinogener [5]
- halvtime [1]
- hasj [3]
- heroin [8]
- heteslag [1]
- hippiegenerasjon stoff [1]
- hjelpestoff [1]
- hjern [3]
- hjern innbill [1]
- hjerne [1]
- hjerneslag [1]
- hjert [1]
- hjerte [1]
- housegenerasjon [1]
- housegenerasjon foretrukne rusmiddel [1]
- hovedside [1]
- hukommelse [2]
- hygiene [1]
- hørselsbedrag [1]
- illusjon [1]
- infarkt [1]
- innbill [1]
- inndeling [1]
- innhold [1]
- interesse [1]
- internasjonalt [6]
- kapsl [1]
- kaustisk [1]
e Of Contents
Done
Internet


Search results - Microsoft Internet Explorer
Edit View Favorites Tools Help
Back Search Favorites Media
http://www.corporum.com/results/agentsearchResults.asp
Search Web Search Site PageRank Site popups allowed Options
CORPORUM™
New agent Search Best links Logout Home
Personal
Narkotika
Keyword search Orthogonal list Natural language query
Concepts in English to search for
stoff
Boolean
AND
Search In
Narkotika
Search
Show details
lsd [10]
amfetamin [8]
ecstasy [8]
ghb [7]
kokain [7]
rus [7]
heroin [6]
cannabis [5]
hallusinogen [5]
Search results by agent
[-] Narkotika[14 hits]
[+] Corporate memory [14 hits]
Page 1 of 1 [14 hits found]
1 [Narkotika] Narkotika [VERY SIGNIFICANT AND INTERESTING]
Score:97
stoff, narkotiske stoff, GHB, kokain, LSD, amfetamin, khat, ecstasy, Oversikt, heroin,
stoff, Hallusinogene stoff, Sentralstimulerende stoff, Acrobat Reader, Hallusinogen,
Det er denne forstyrrelsen som oppleves som rus, og som kan føre til at hjernen innbiller seg tilstander som munte
avslappethet, men også tilstander man ikke ønsker: angst, depresjon, skrekkvisjoner eller forfølgelsestanker. No
hallusinasjoner. Effektene av narkotiske stoffer...
Hit analysed: 10.10.2003 - 11:24 Last Modified: Exact date not specified (changed prior to 10.10.2003 - 11:24)
2 [Narkotika] Meditest.no - Narkotika tester, Alkohol tester, Graviditets tester
INTERESTING]
Score:65
narkotiske stoff, stoff, hjernen, effekt, rus, angst, depresjon, rusmidler, Narkotika, ecstasy, LSD, heroin, kokain, amfetamin, khat, GHB, hjernen innbiller, utholdenhet, skrekkvisjoner, forfølgelsestanker
Inndelingen av stoffer: Sentralstimulerende stoffer: amfetamin, kokain, GHB, khat og ecstasy Sentraldempende stoffer: cannabis, heroin og beroligende piller Hallusinogene stoffer: ecstasy, LSD, naturlige hallusinogener og cannabis (stor mengde) Narkotika og avhengighet De fleste narkotiske stoffer gir en opptur som etterfølges av en fysisk og psykisk nedtur. Det...
Hit analysed: 10.10.2003 - 11:18 Last Modified: Exact date not specified (changed prior to 10.10.2003 - 11:18)
3 [Narkotika] Barnemix - Narkotika - Stoffer som påvirker sanseinntrykk [ABSOLUTELY READWORTHY]
Score:48
stoff, GHB, ecstasy, rus, brukeren, langtids, LSD, psykose, angst, depresjoner, åpenhet, følelse, hallusinogener, kroppen, Yaabaa, ketamin, gjenopplevelse, housegenerasjonens foretrukne rusmiddel, sluttet, Ecstasyrusen gir
På samme måte som LSD og cannabis var hippiegenerasjonens stoffer, har ecstasy etablert seg som housegenerasjonens foretrukne rusmiddel. Stoffet har til og med
Done
Internet

Search results - Microsoft Internet Explorer

le Edit View Favorites Tools Help

Back Search Favorites Media

dress http://www.corporum.com/results/agentsearchResults.asp

oogle Search Web Search Site PageRank Site popups allowed Options

CORPORUM™

New agent | Search | Best links | Logout | Home

SHDIR \ SHDIR viewer account

Personal

Narkotika

Keyword search | Orthogonal list | Natural language query

Concepts in English to search for

stoff cannabis

Boolean

AND

Search In

Narkotika Search Show details

Search results by agent

[-] Narkotika[5 hits]

[+] Corporate memory [5 hits]

Page 1 of 1 [5 hits found]

1 [Narkotika] Khat [ABSOLUTELY READWOR

Score:3 *Fakta, rusmidler, Stoff, Antall misbrukere, H*

Hovedside, Fakta, Narkotikalovgivningen, N

Amfetamin Benzodiazepiner Cannabis Ecstasy GHB Hallusinogener narkotika Overdosedødsfall Antall misbrukere Narkotikabeslag og Ungdom og rusmidler Hovedside...

Hit analysed: 10.10.2003 - 11:09 Last Modified: Exact date not spe

2 [Narkotika] Meditest.no - Narkotika t READWORTHY]

Score:0 *LSD, stoff, hallusinogen, hallusinogen effekt Narkotikabeslag, smaks, Sniffestoffer, hørs*

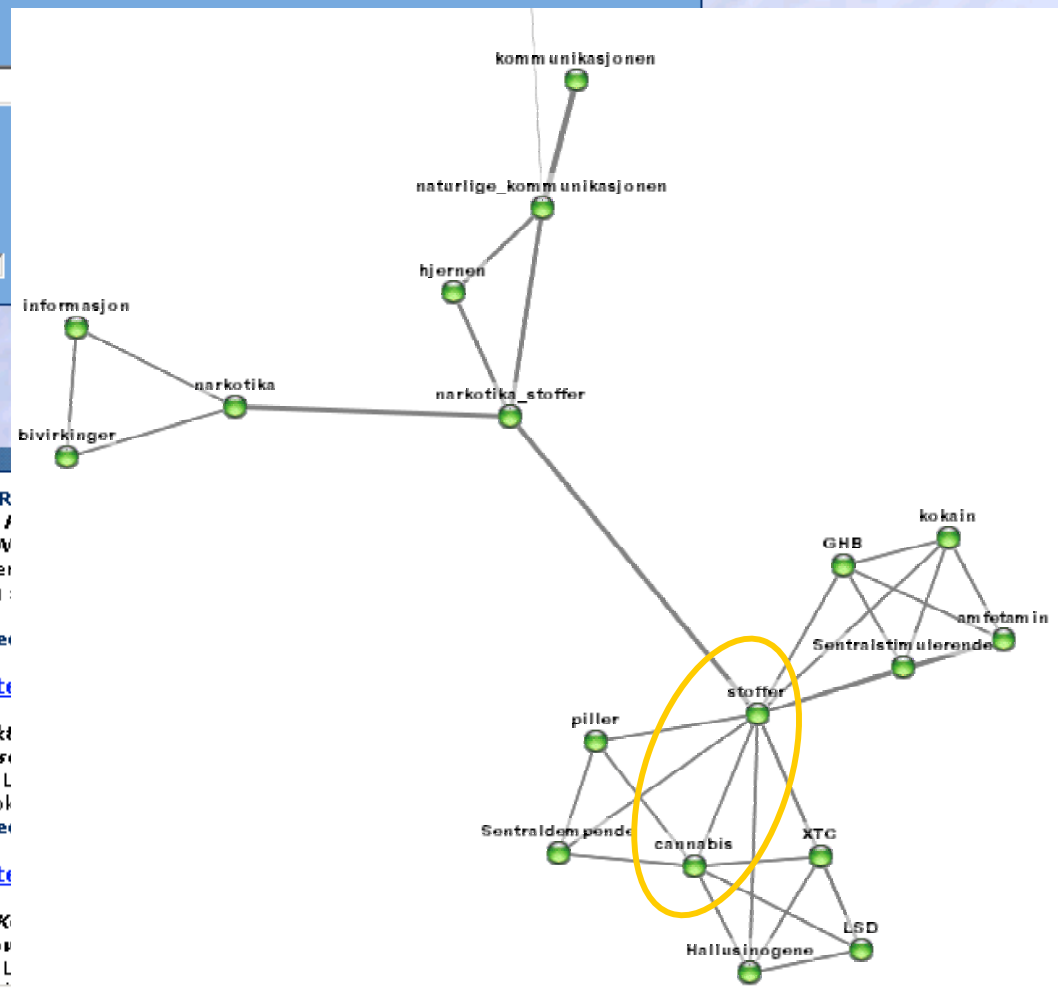
Forsiden Produkter Fakta om rusmidler Nyheter Nettbutikk Forum L Benzodiazepiner Cannabis Ecstasy GHB Hallusinogener Heroin Kok

Hit analysed: 10.10.2003 - 14:37 Last Modified: Exact date not spe

3 [Narkotika] Meditest.no - Narkotika t READWORTHY]

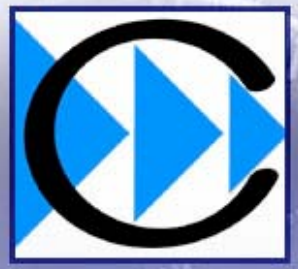
Score:0 *GHB, rusmidler, narkotika, stoff, Ecstasy, K Khat, gammahydroksybutyrat, Narkotikalov*

Forsiden Produkter Fakta om rusmidler Nyheter Nettbutikk Forum L



Done

Internet



This talk

- The need for Semantic Technology
- The Business Case:
  - *Hydro Aluminium and Metal Products Dept.*
- Using it: how to get to your Knowledge
- Technology
  - *Creating Knowledge Bases*
  - *Semantic Based Search & Retrieval*
  - *Summarisation*
  - *Indexing & Categorisation by Agents*
- Using Mr. Anderson: Business Intelligence
- Conclusion

CORPORUM(TM) Analyzer

File Edit Analyze Export Help

Connect Database Disconnect Exit

Analyze

Domains

Scores

Advanced...

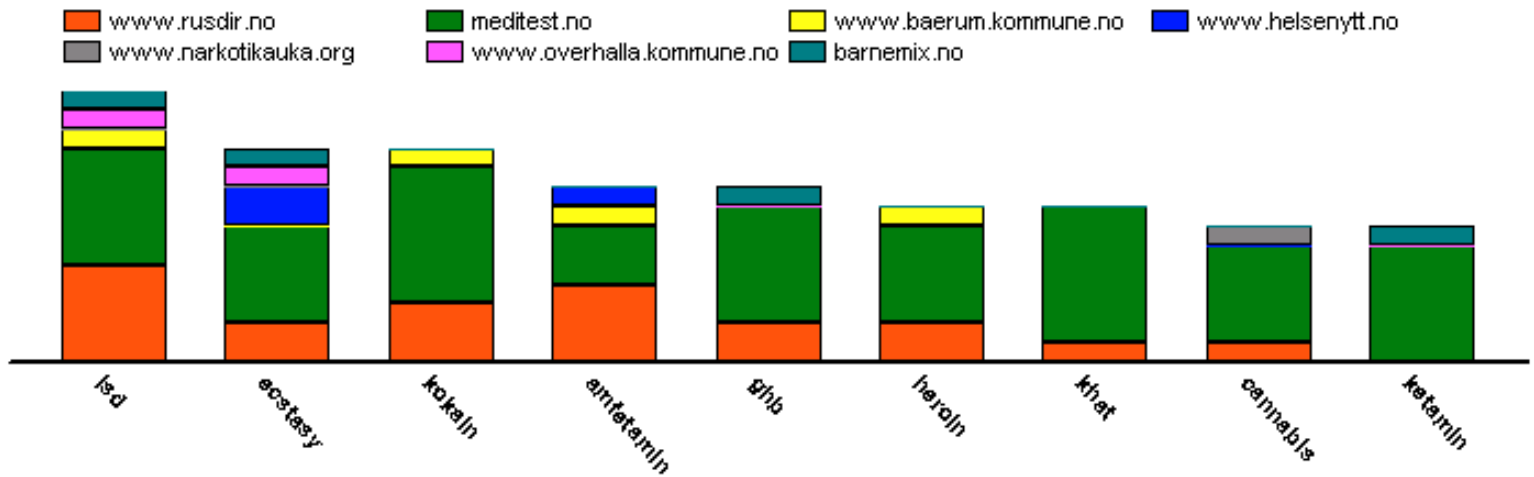
Sentences

Best Hits

Concepts ...

Export

Concepts by domains



Domains

- [x] www.rusdir.no
- [x] meditest.no
- [x] barnemix.no
- [x] www.helsenytt.no
- [x] www.overhalla.kommune.no
- [x] www.lommelegen.no
- [x] www.narkotikauka.org
- [x] www.baerum.kommune.no

Concepts

- [x] lsd
- [ ] stoff
- [x] ecstasy
- [x] kokain
- [x] amfetamin
- [x] ghb
- [x] heroin
- [x] khat
- [ ] rusmidl
- [ ] rus
- [x] cannabis
- [x] ketamin
- [ ] narkotikabeslag
- [ ] narkotika

This talk

- The need for Semantic Technology
- The Business Case:
  - *Hydro Aluminium and Metal Products Dept.*
- Using it: how to get to your Knowledge
- Technology
  - *Creating Knowledge Bases*
  - *Semantic Based Search & Retrieval*
  - *Summarisation*
  - *Indexing & Categorisation by Agents*
- Another Use: Business Intelligence
- Conclusion

- HAMP Business System very succesful!
- Used in whole Business Unit
  - » 4000-5000 contemporary users
  - » Other BU's to follow?
- Enables transparent access to information
- 4 languages implemented: Norwegian, English, German, Spanish, (Swedish)
- Uses multiple dimensions
  - » User Push (Business Processes)
  - » User Pull (pro-active agent technology)
  - » Active Search (using Semantic Relations)
  - » Library Services (cf. Automated TOC)
- Drawback:
  - » Unfamiliarity with this type of technology (cf. Scansofts point)
- Evaluated positive:
  - » Provide several ways to find the "unknown"!
  - » Great help in exploration of Knowledge Assets in the Company!
  - » Supports and Educates "newbies"!

Contact details

Robert Engels

CognIT a.s

Meltzersgt.4

0257 OSLO

Norway

Tel: +47 22540523

Email: robert.engels@cognit.no

URL: www.cognit.com