STKOS Development & Its Application Service in ISTIC

Ying LI@ISTIC
Information Technology Support Center
Institute of Scientific and Technical Information of China (ISTIC)

ICSTI 2014,Miraikan, Tokyo, JAPAN
October 20 (Mon.)2014, 15:30-16:00

Outline

1. Background & Introduction
2. Overview of STKOS*
3. Application of STKOS in：
   - NSTL (National Science and Technology Library, a digital library) , for Implementation of intelligent retrieval
   - monitoring technical trends
   - industry knowledge system
4. the cooperation between information organizations in China-Japan-Korea ⇒ ISTIC-JST-KISTI

* In our project, STKOS stands for Scientific Technical Knowledge Organization System.

1. Background & Introduction

- STKOS Positioning
- What is KOS ?
- What is STKOS ?

STKOS Positioning

Government Granted Projects in China：

→ One type of national projects is named as:

the National Key Technologies R&D Program of the 12th 5-Year Plan (in China)(2011–2015)

→ One of projects implanted by ISTIC:

Construction of Knowledge Organization System (KOS) and Application Oriented Foreign Science & Technology Literature

→→ One of the seven sub-projects : STKOS

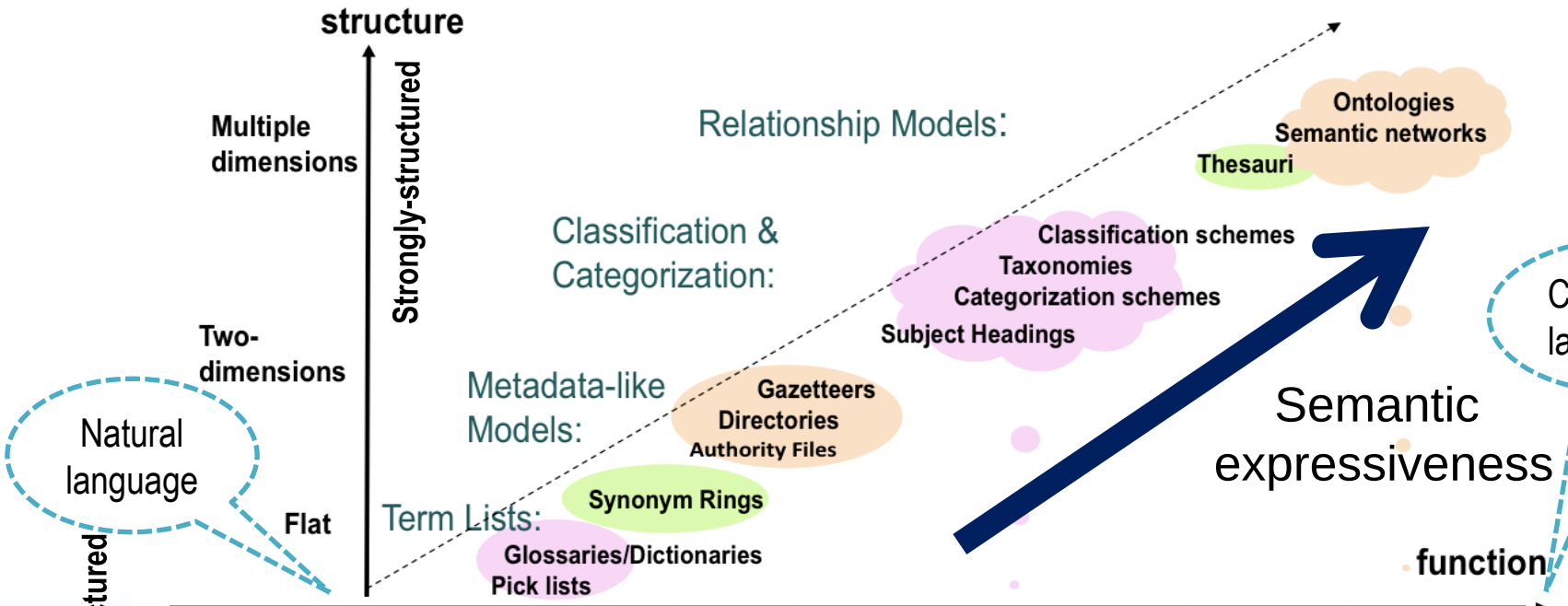
What is KOS

KOS stands for Knowledge Organization Systems

Schemes for Organizing Information & Promoting Knowledge Management

- Term lists (authority files, glossaries, dictionaries, gazetteers)
- Classification & categories (classification scheme, taxonomy, subject headings)
- Relationship lists (thesaurus, semantic network, ontology)

KOS Types

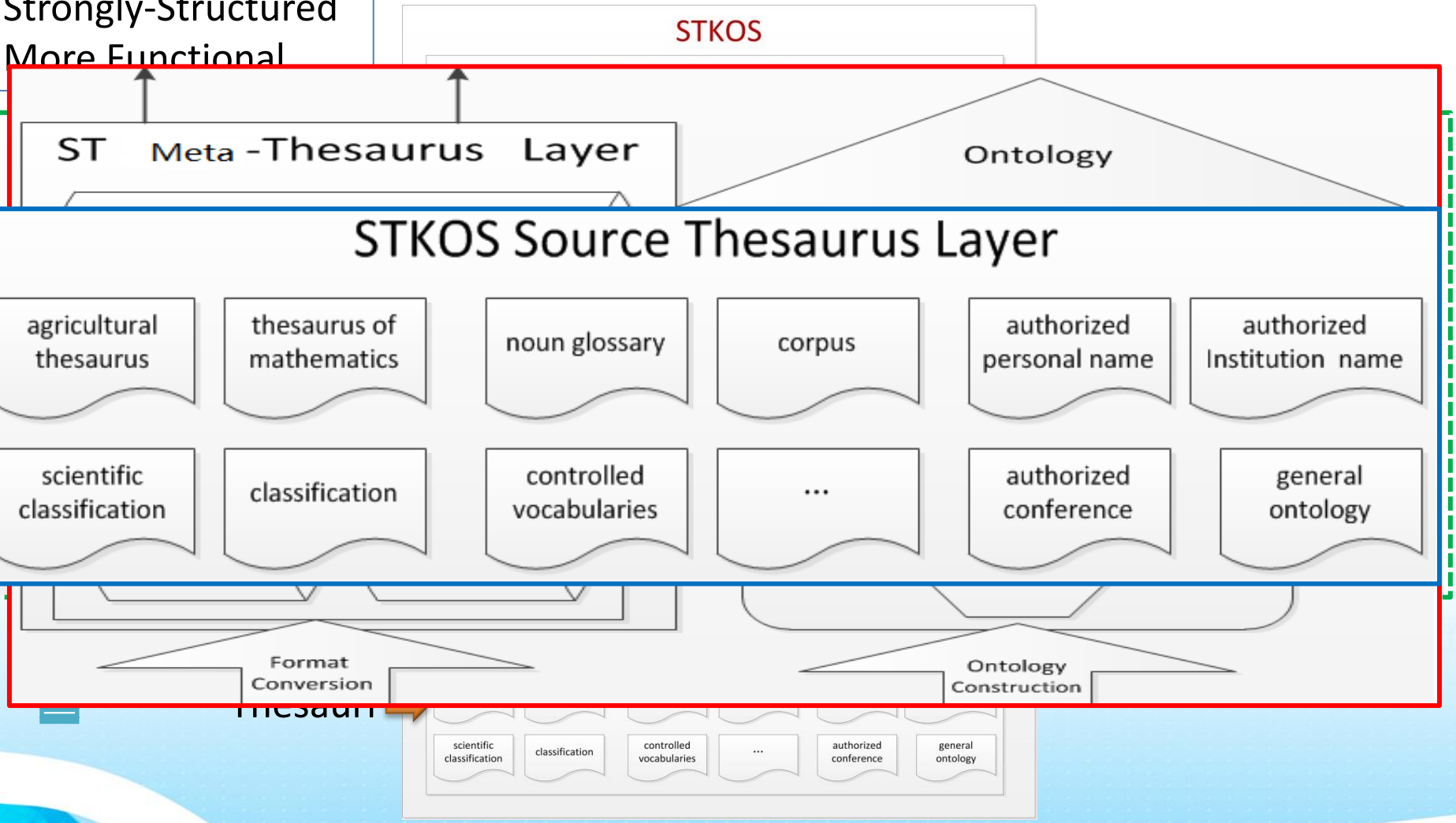


Major functions						
eliminating ambiguity	xxx		xxx	xx	xxxx	xx
controlling synonyms		xxxx	xxx	xx	xxxx	xx
establishing relationships: hierarchical			x	xxxx	xxx	xxx
establishing relationships: associative					xxxx	xxxxx
presenting properties						xxxxx

Come from slides of Zeng, 2008.

What is STKOS

Strongly-Structured
More Functional



2. Overview of STKOS Construction

- Construction Goals
- Construction Flow of STKOS
- Metadata Schema of STKOS
- Service Platform for construction

Objectives / Goals

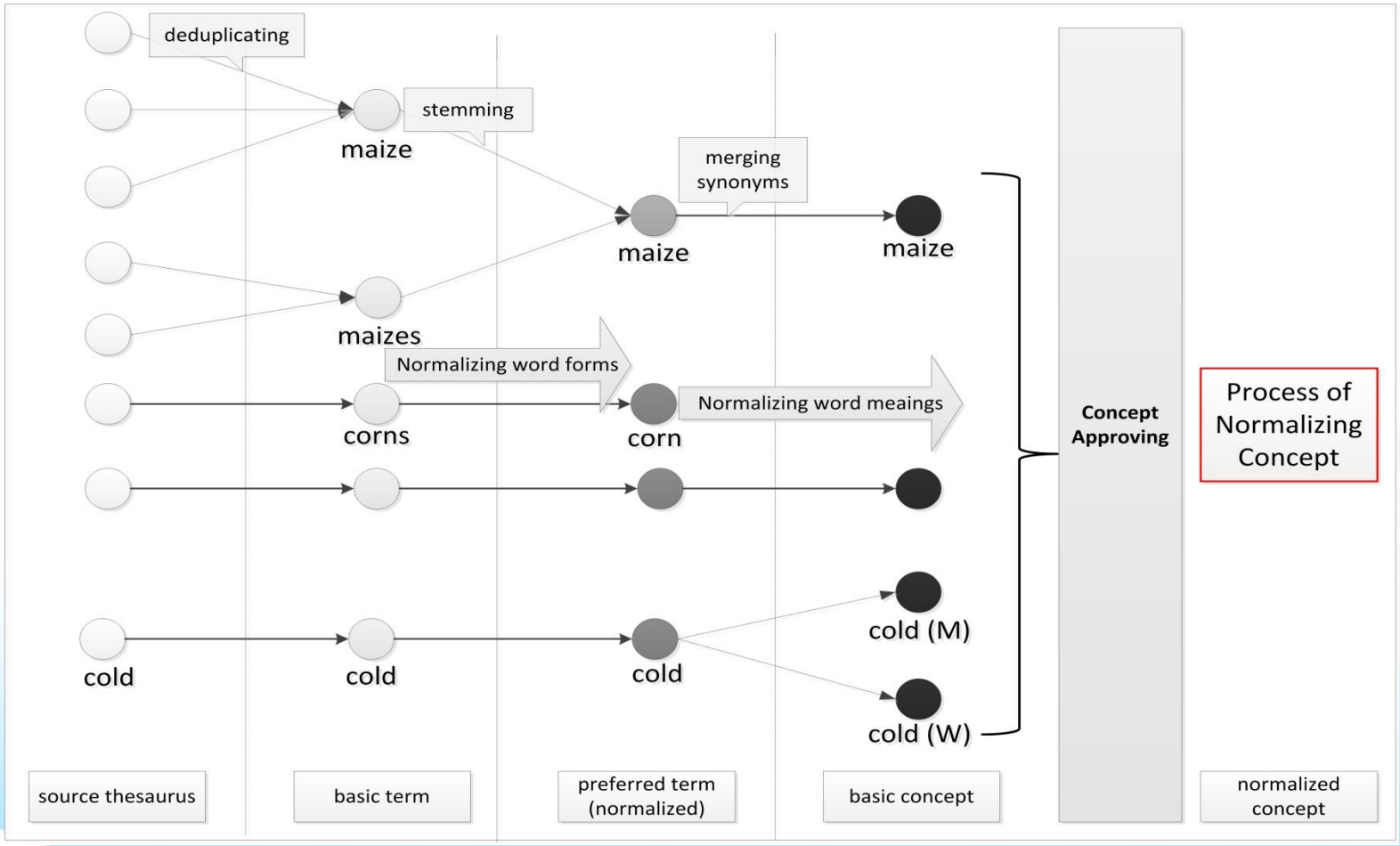
Concrete Goals:

- Source Thesaurus, 10 M
- ST Term, ＞ 5 M
- ST Concept, 800 K

Long-term Goals:

- Supporting organization and application of large-scale foreign ST literature
- Achieving effective organization, depth representation, associating knowledge for ST literature
- Enhancing our institute service ability : knowledge discovery, knowledge mining, knowledge computing
- Upgrading the overall service level of literature institutions in China

Data Processing Flow for STKOS(illustrate)

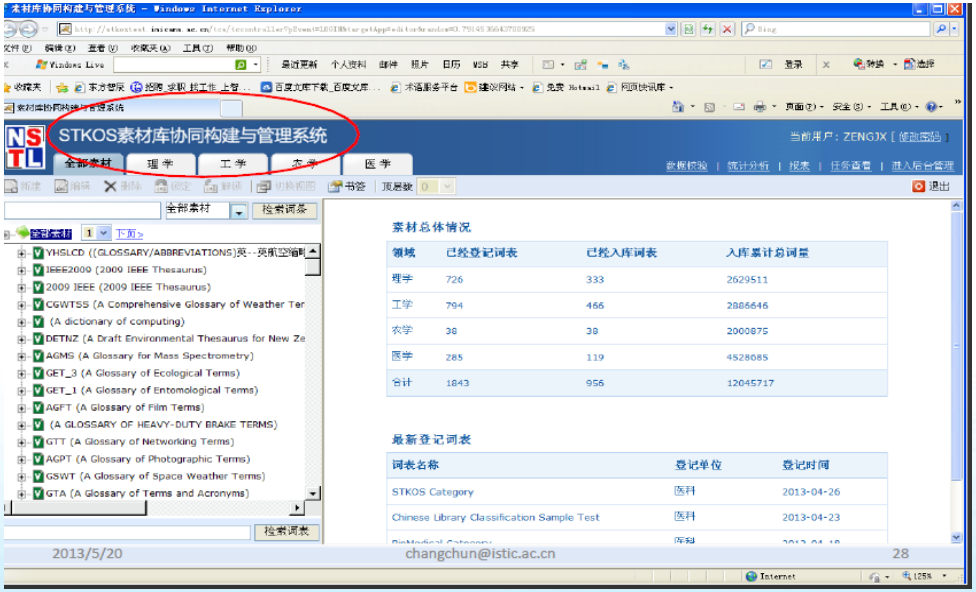


STKOS Metadata Schema

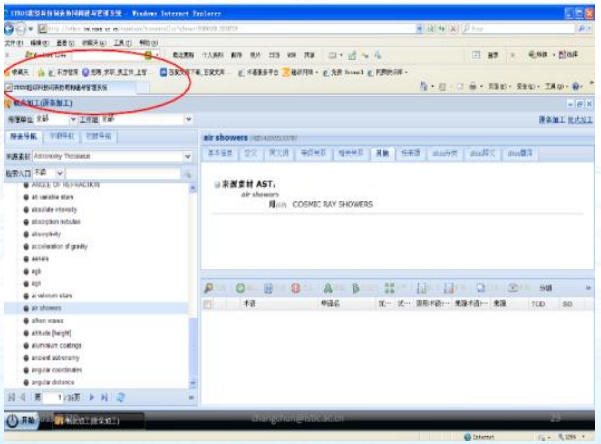
Element Code	Label	Definition	XML Attribute	Frequency of Occurrence	Coding System
01	name	…		(0,n)	URI
04	use	use instead		(0,1)	URI
0401	use and	…		(0,1)	URI
05	used for	…		(0,n)	URI
0502	antonym	…		(0,n)	URI
06	broader term	…		(0,n)	URI

Service Platforms for Data Processing

Collaborative Construction & Management of Source Thesauri



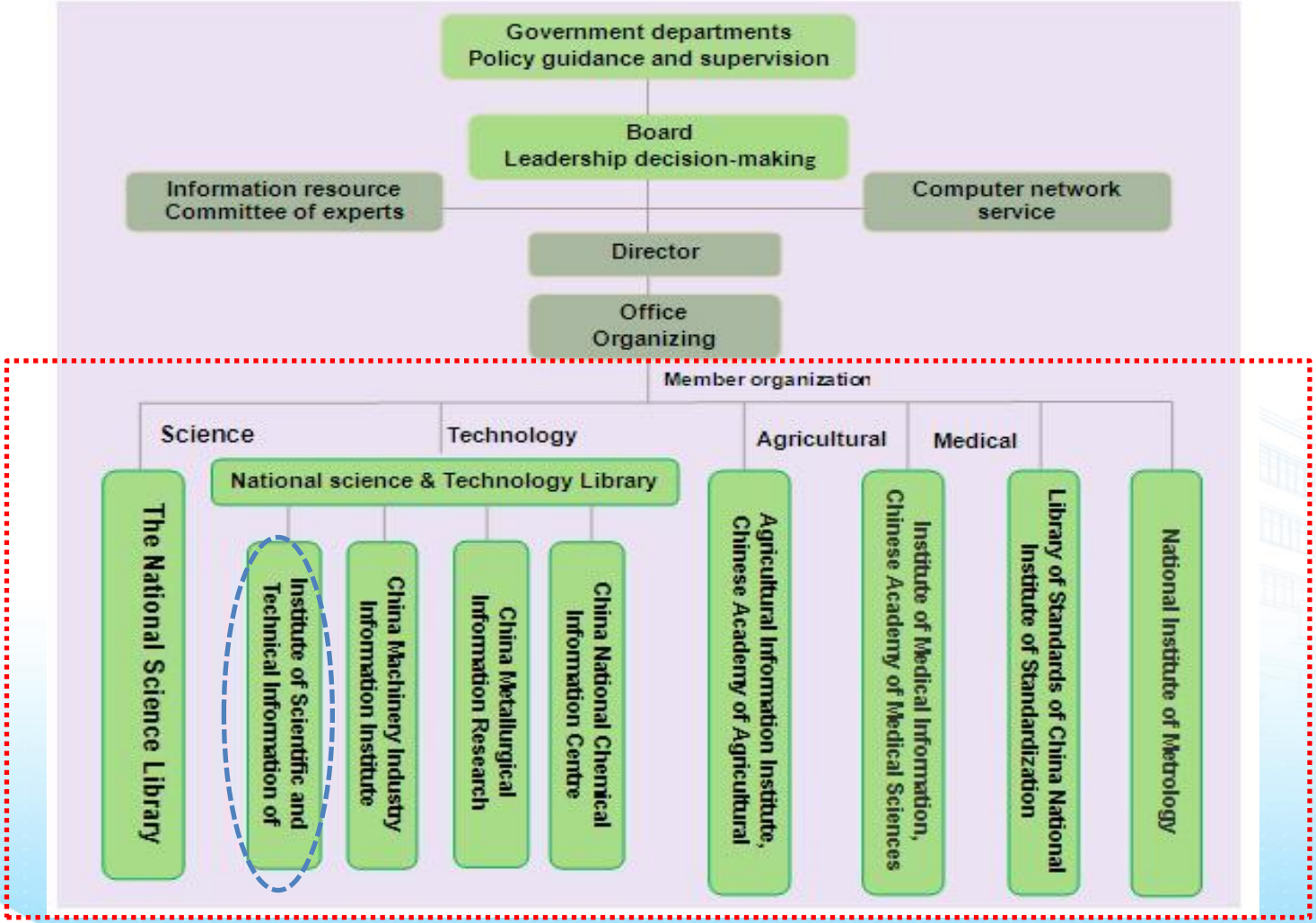
Concept Processing



3. Application of STKOS

- Intelligent Retrieval in NSTL
  - NSTL: National Science & Technology Digital Library. It consists of 9 member libraries. (shown in the next slide)
  - NSTL: provides foreign literature services of science and technology nationwide by 9 member libraries cooperation.
  - journal, patent, proceeding, report, dissertation, standard, etc.
  - English, Japanese, Russian, Chinese, etc.
- Monitoring Technical Trends
- Industry Knowledge System

NSTL Organization Chart



Search Extension Based-on Concept in STKOS

Strongly-Structured
More Functional

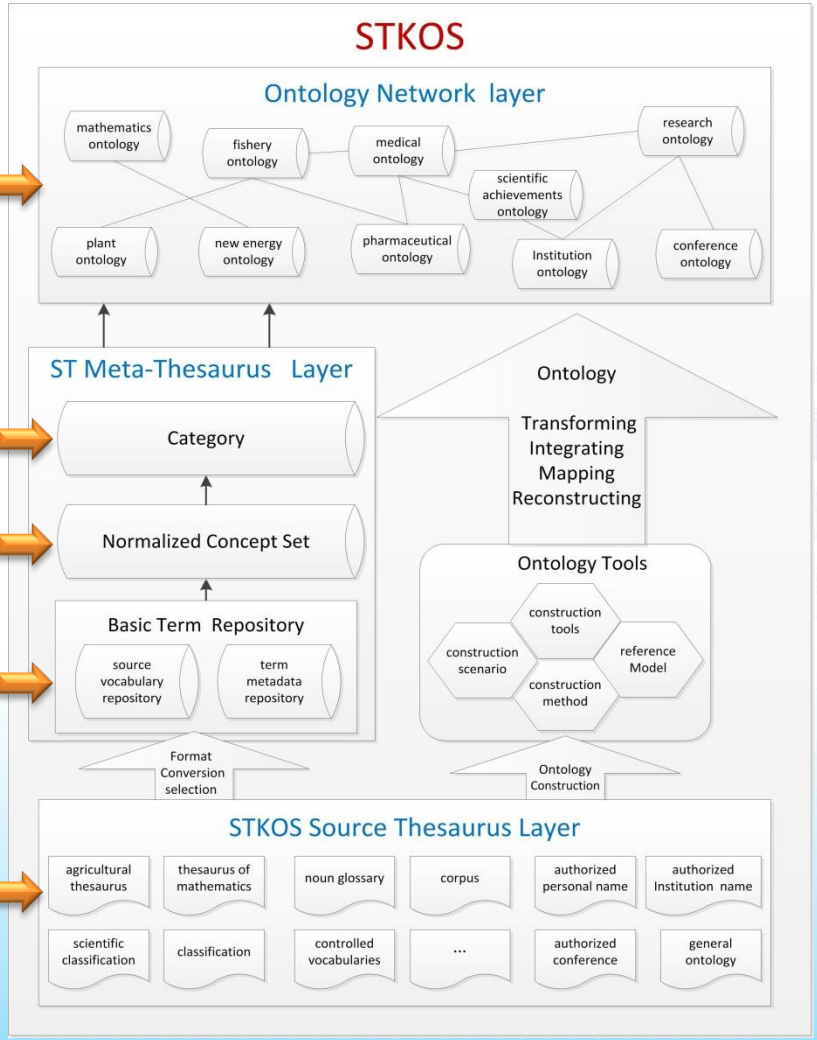
Ontologies

Categories

Concepts

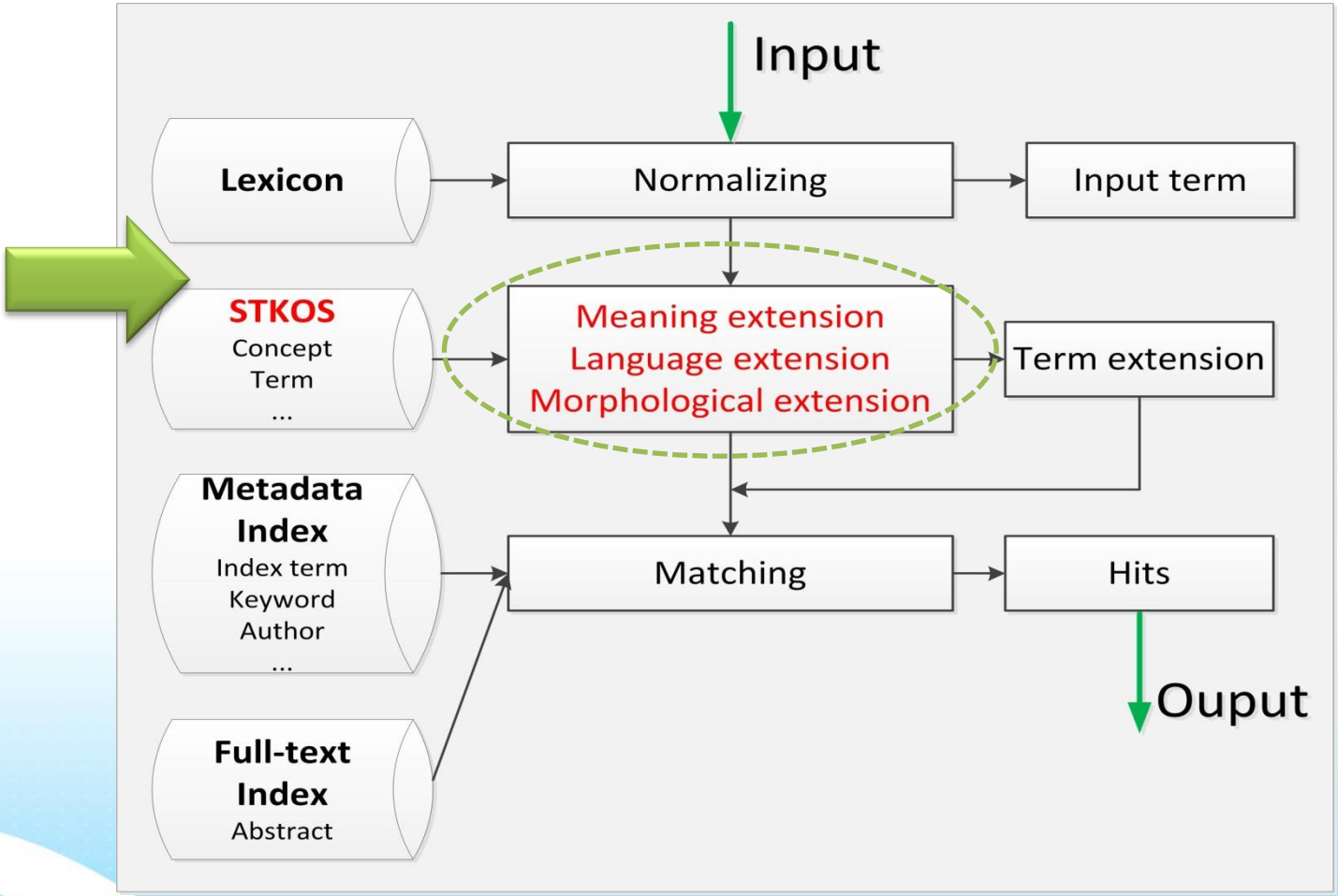
Basic Terms

Thesauri

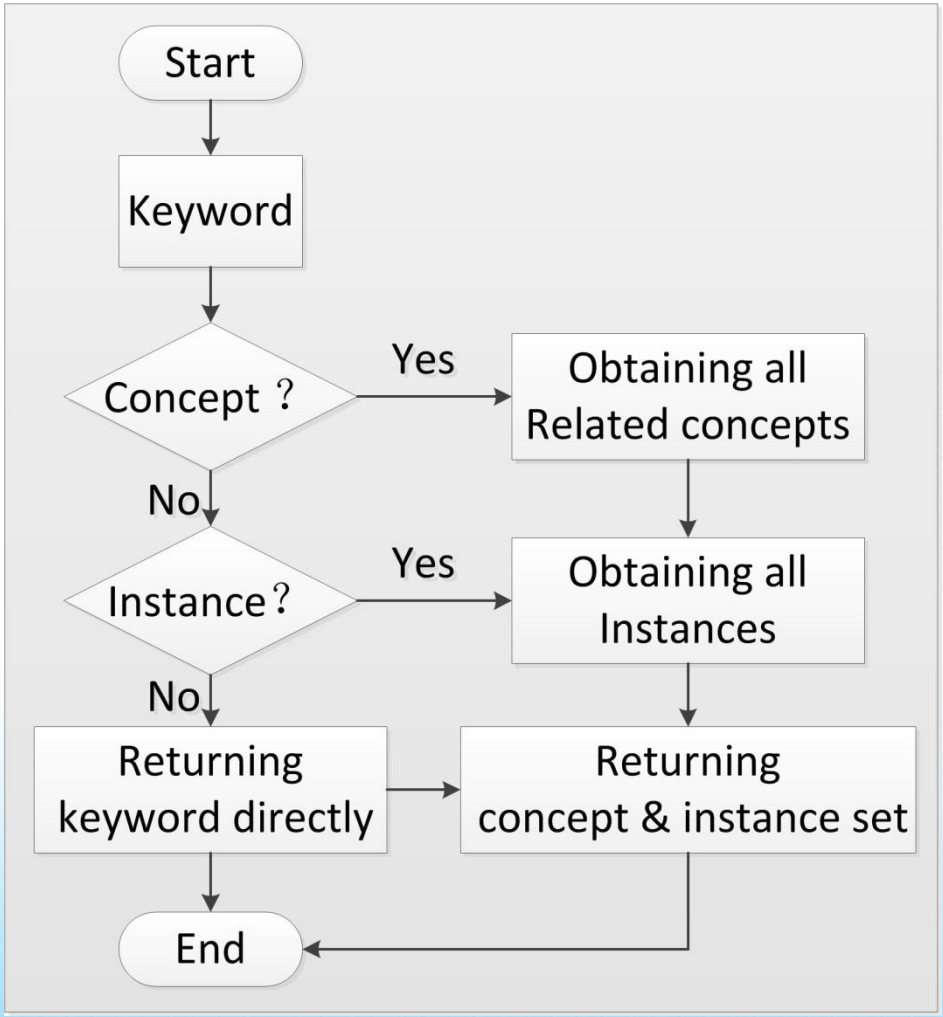


Pilot System: Intelligent Retrieval in NSTL

Search Extension Based-on STKOS Concept in NSTL Intelligent Retrieval



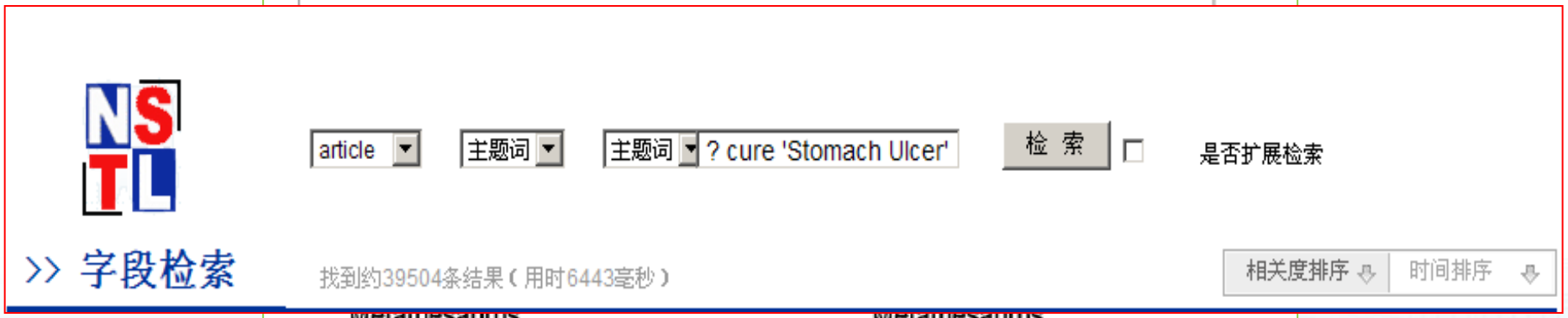
Search Extension -- Concept Extension



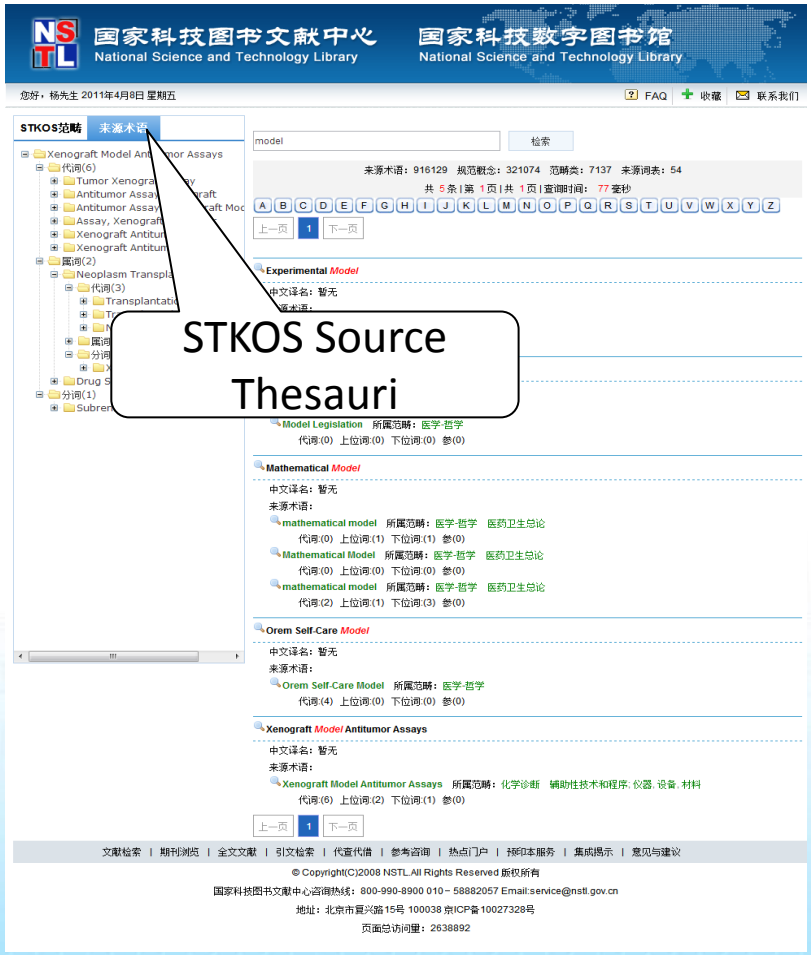
Searching by Semantic Relations

- Search Using semantic relations between concepts

  e.g. Drug --- Therapy / Side-effect --- Disease

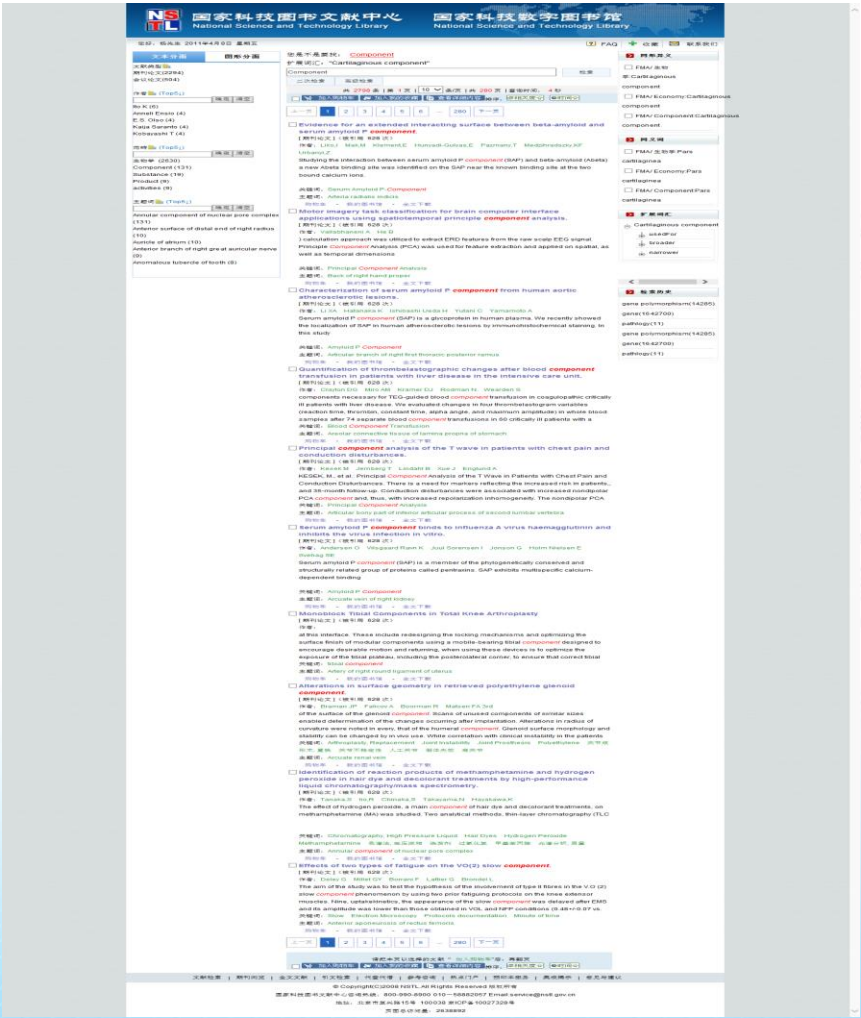


Screenshot (1/5)

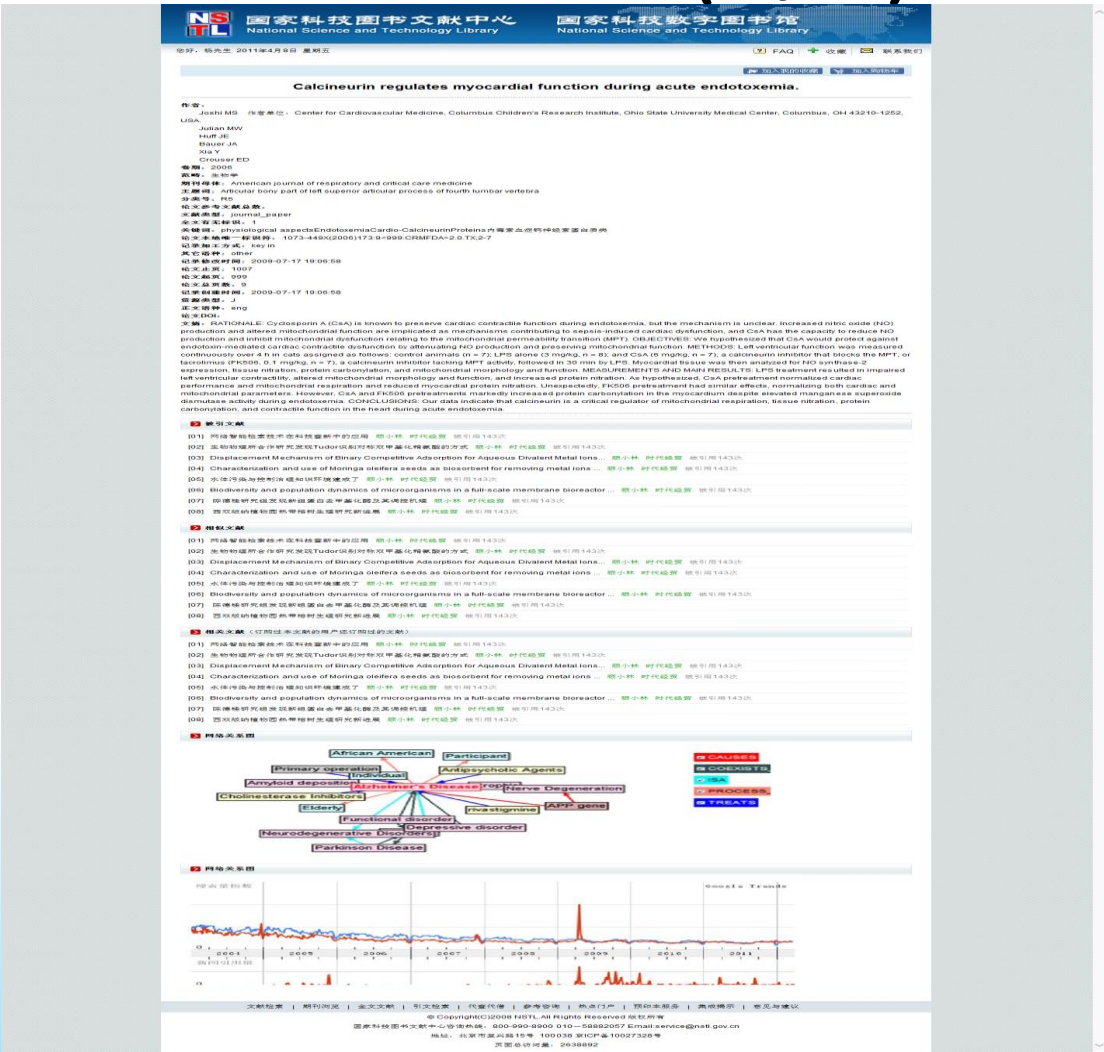


Screenshot (2/5)

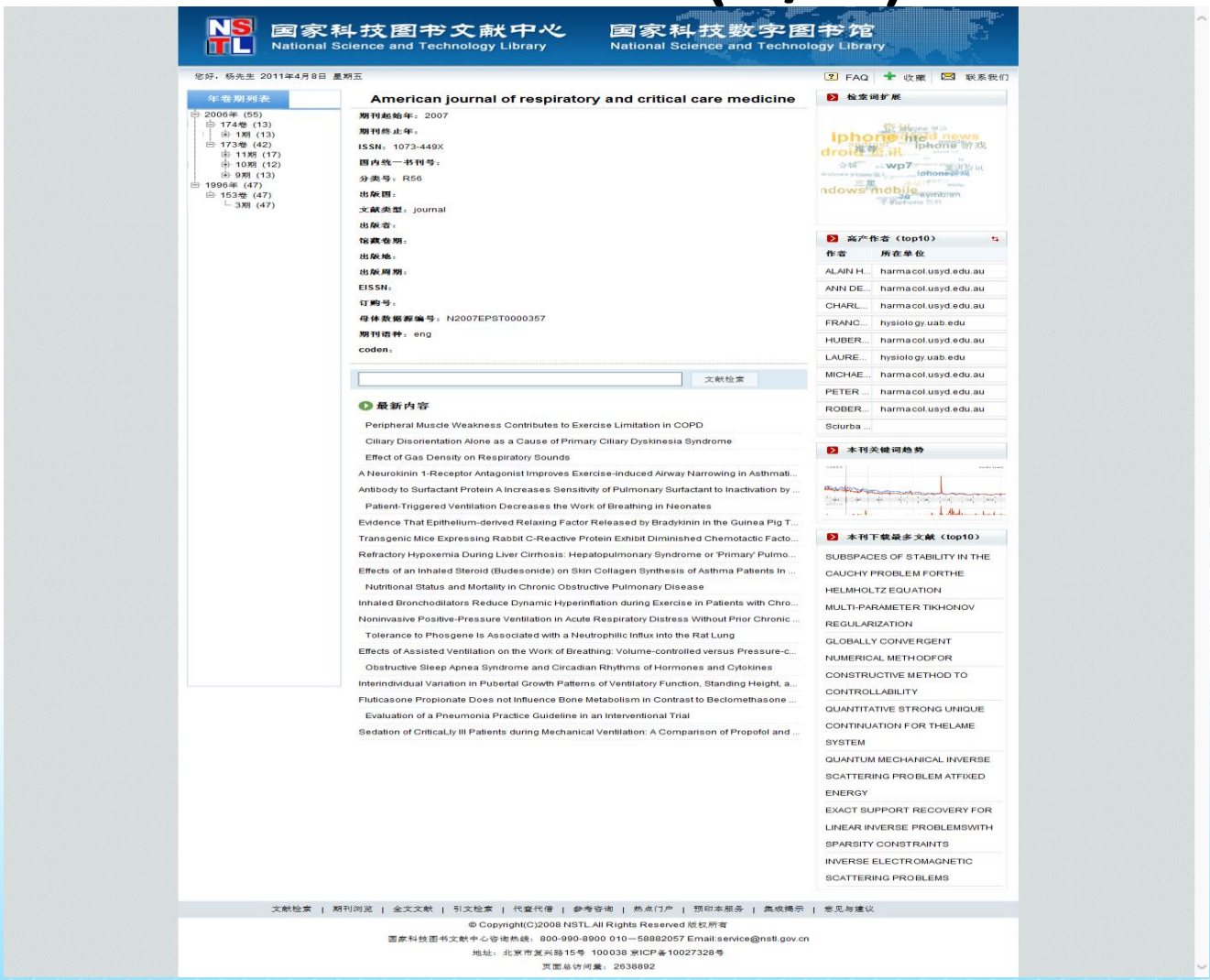
Screenshot (3/5)



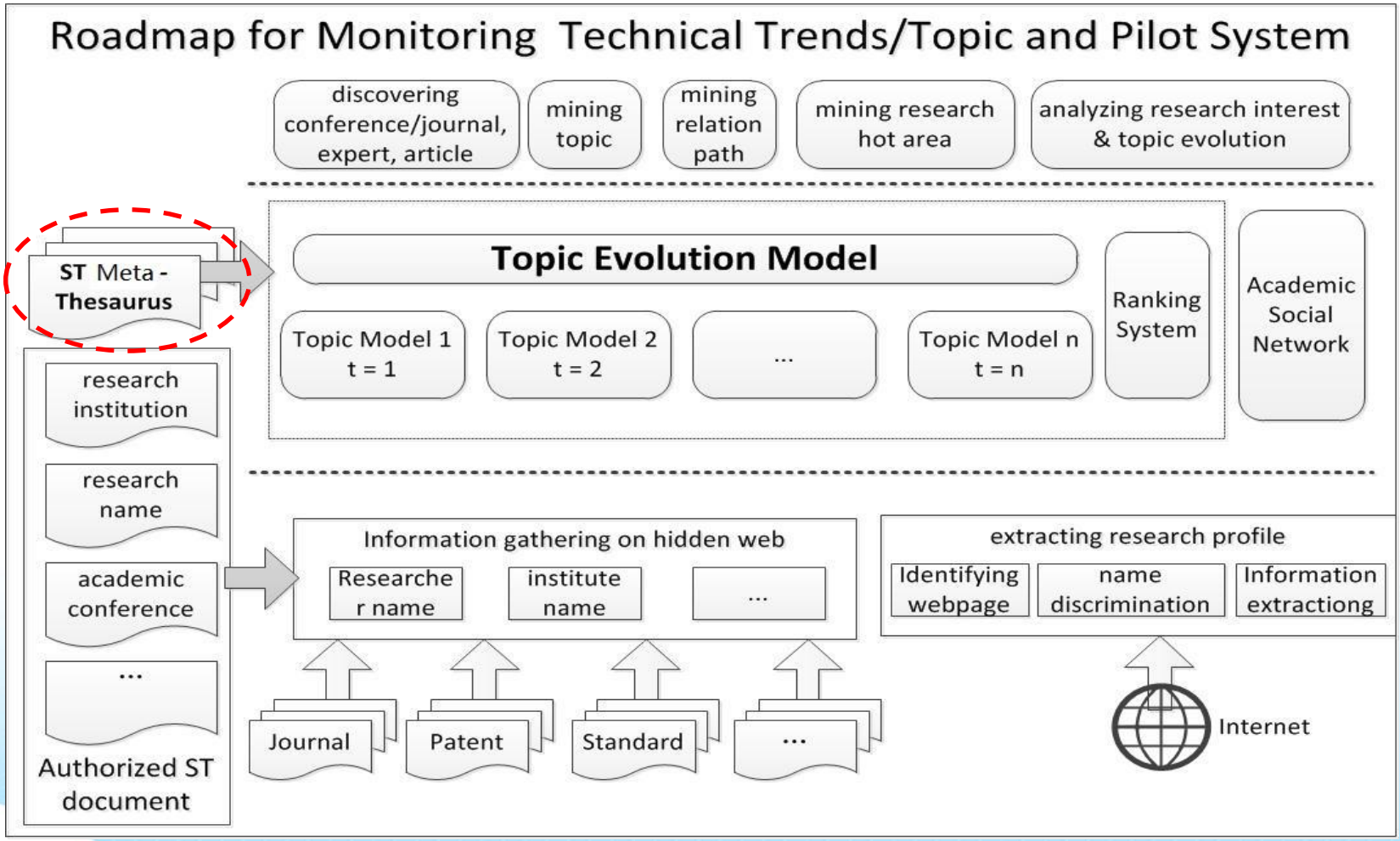
Screenshot (4/5)



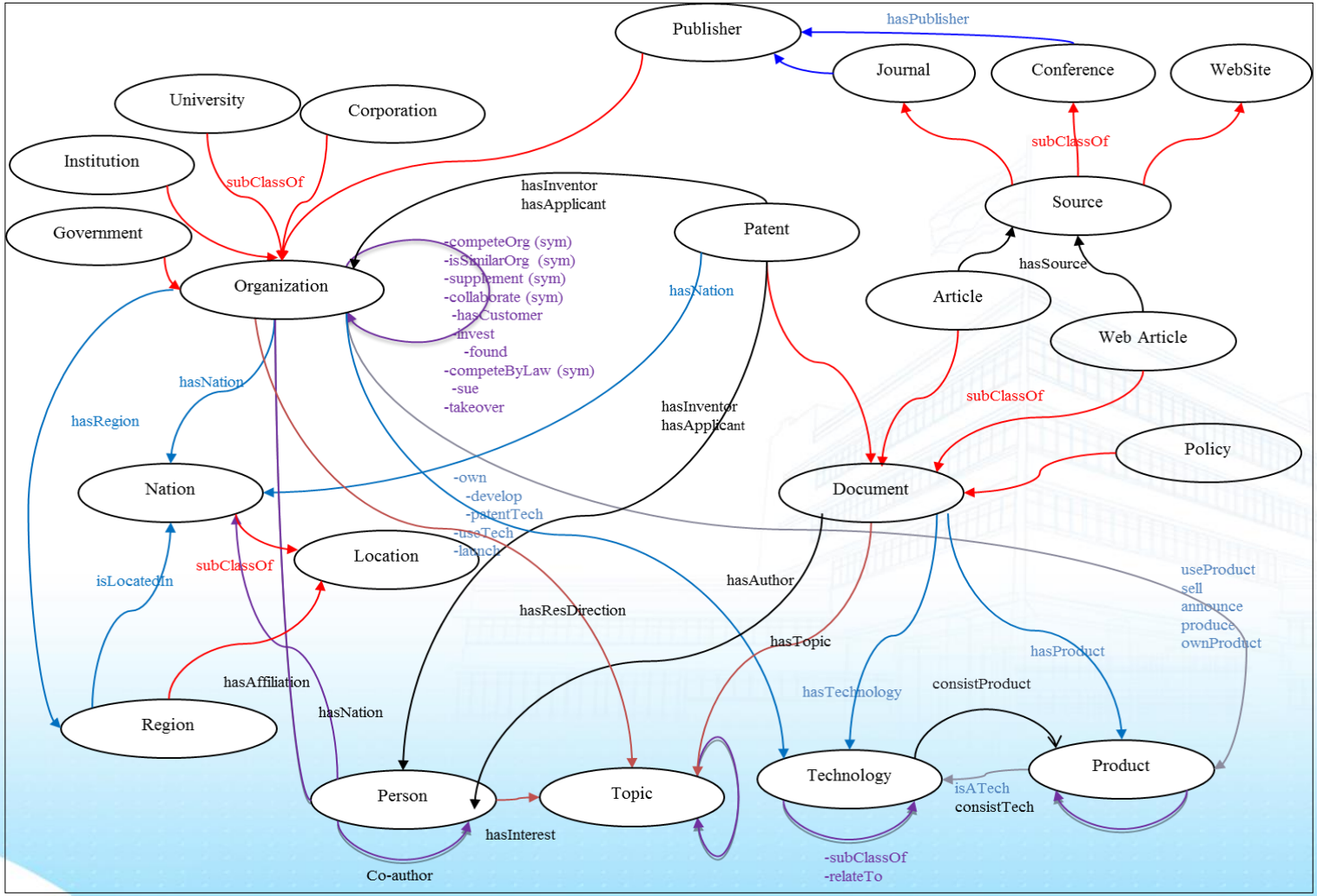
Screenshot (5/5)



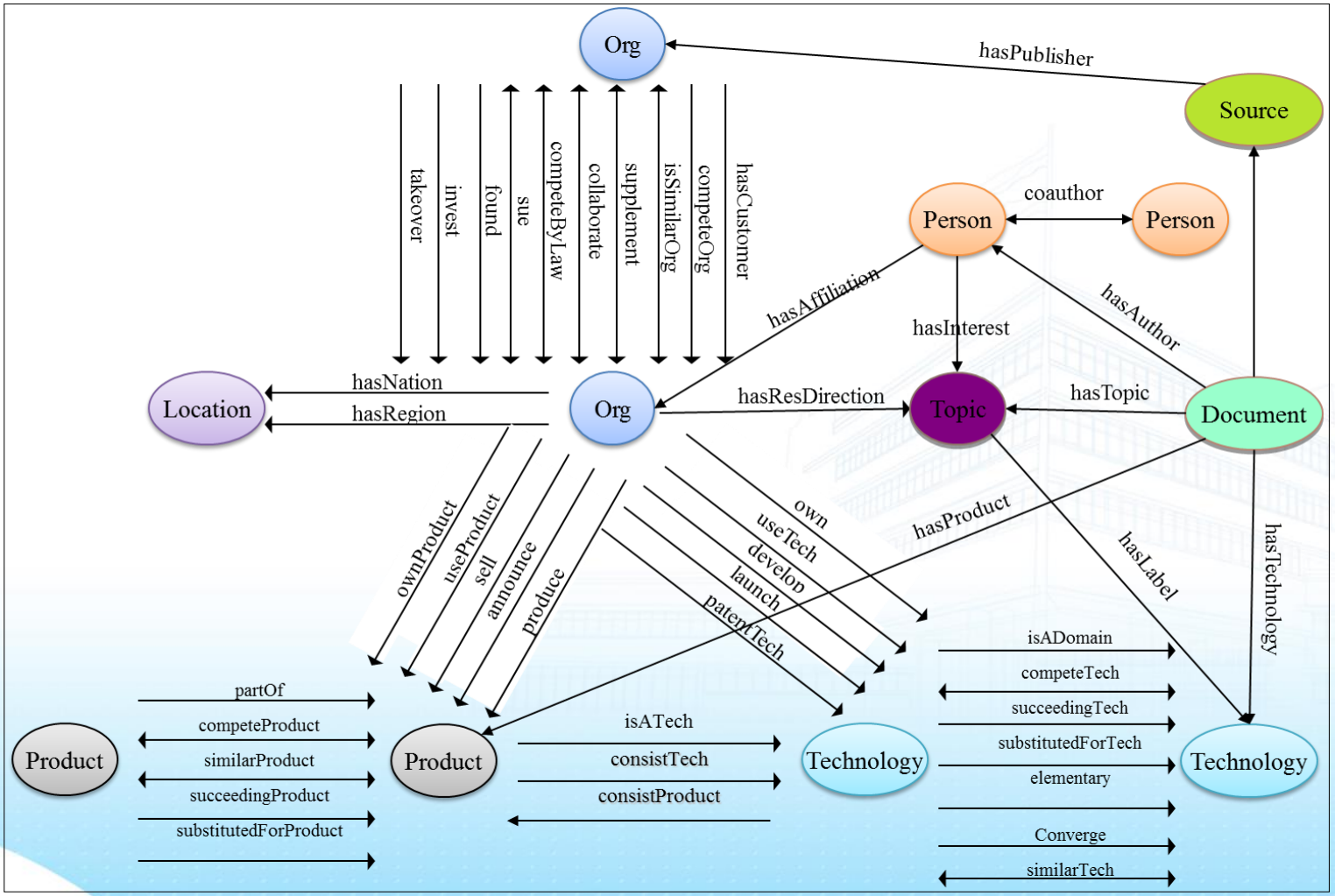
Framework of Monitoring Technical Trends



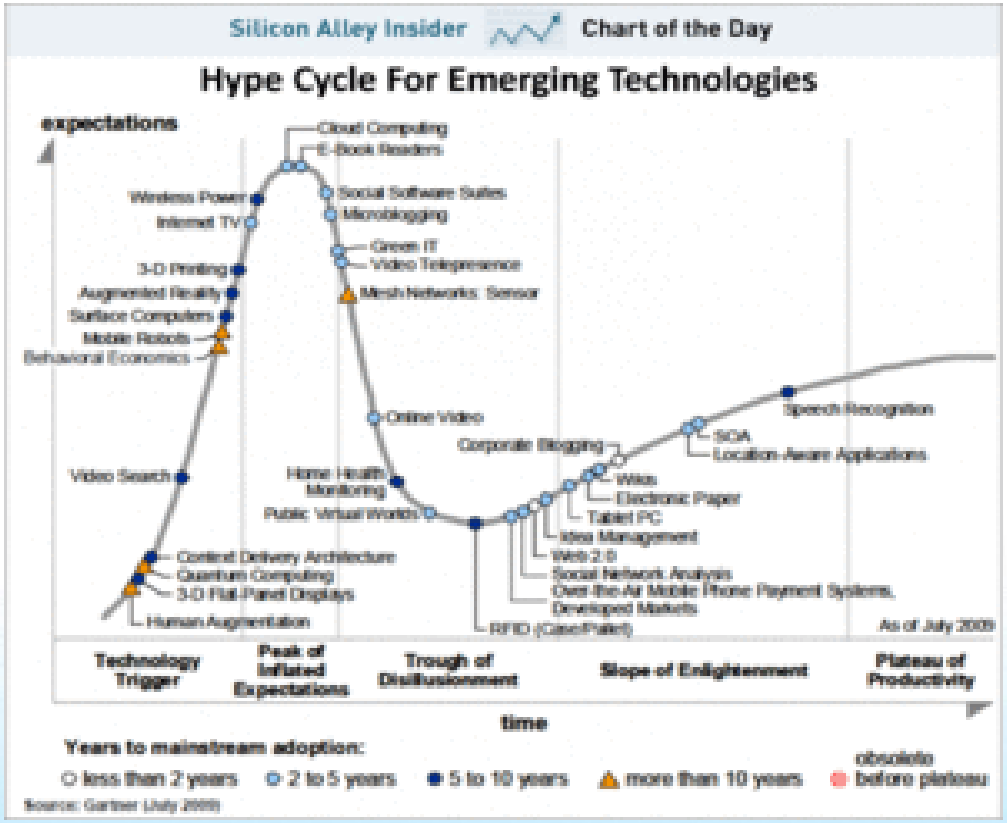
Ontology Model (1/2)



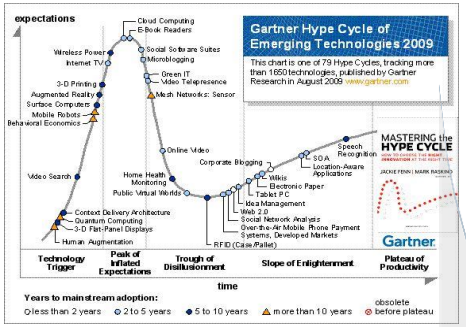
Ontology Model (2/2)

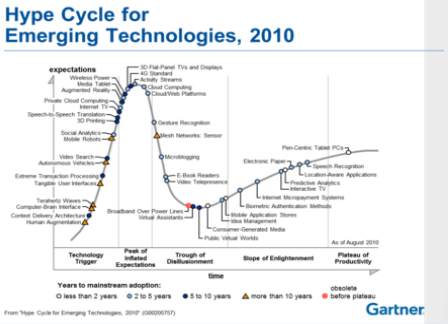


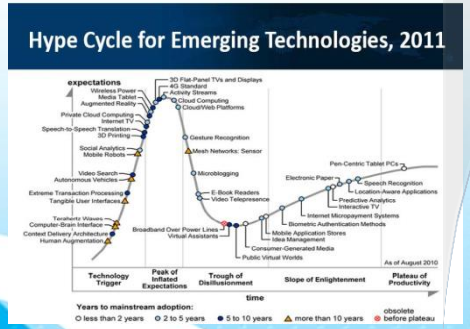
Analyzing Technology Life Cycle (1/4)



Analyzing Technology Life Cycle (2/4)

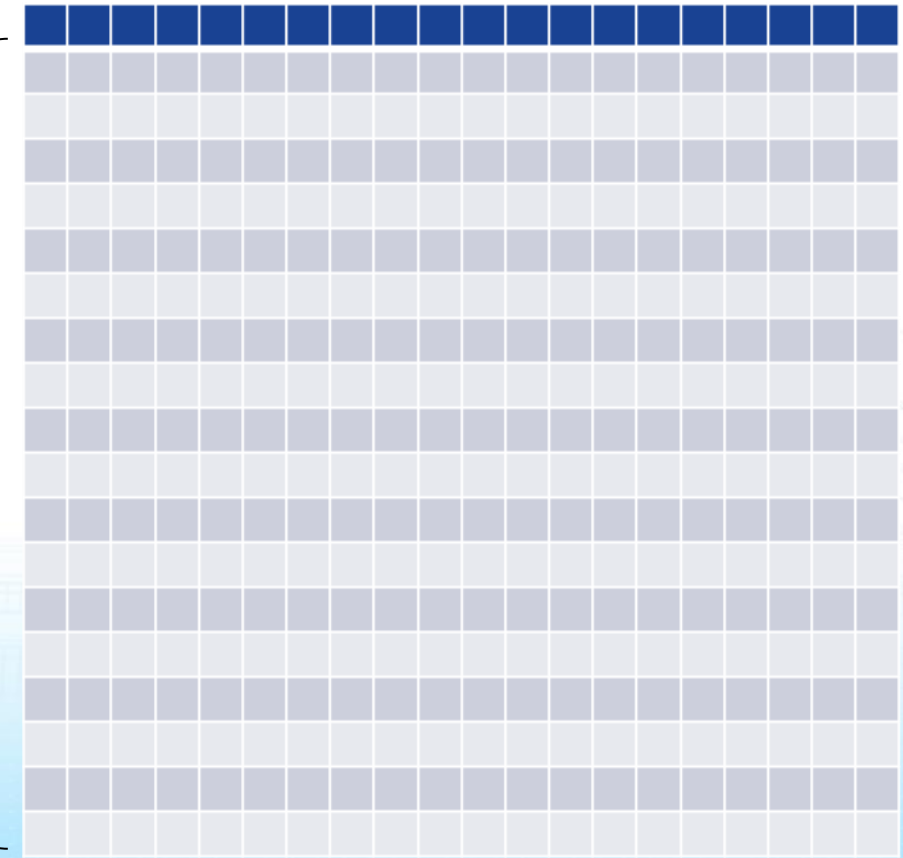




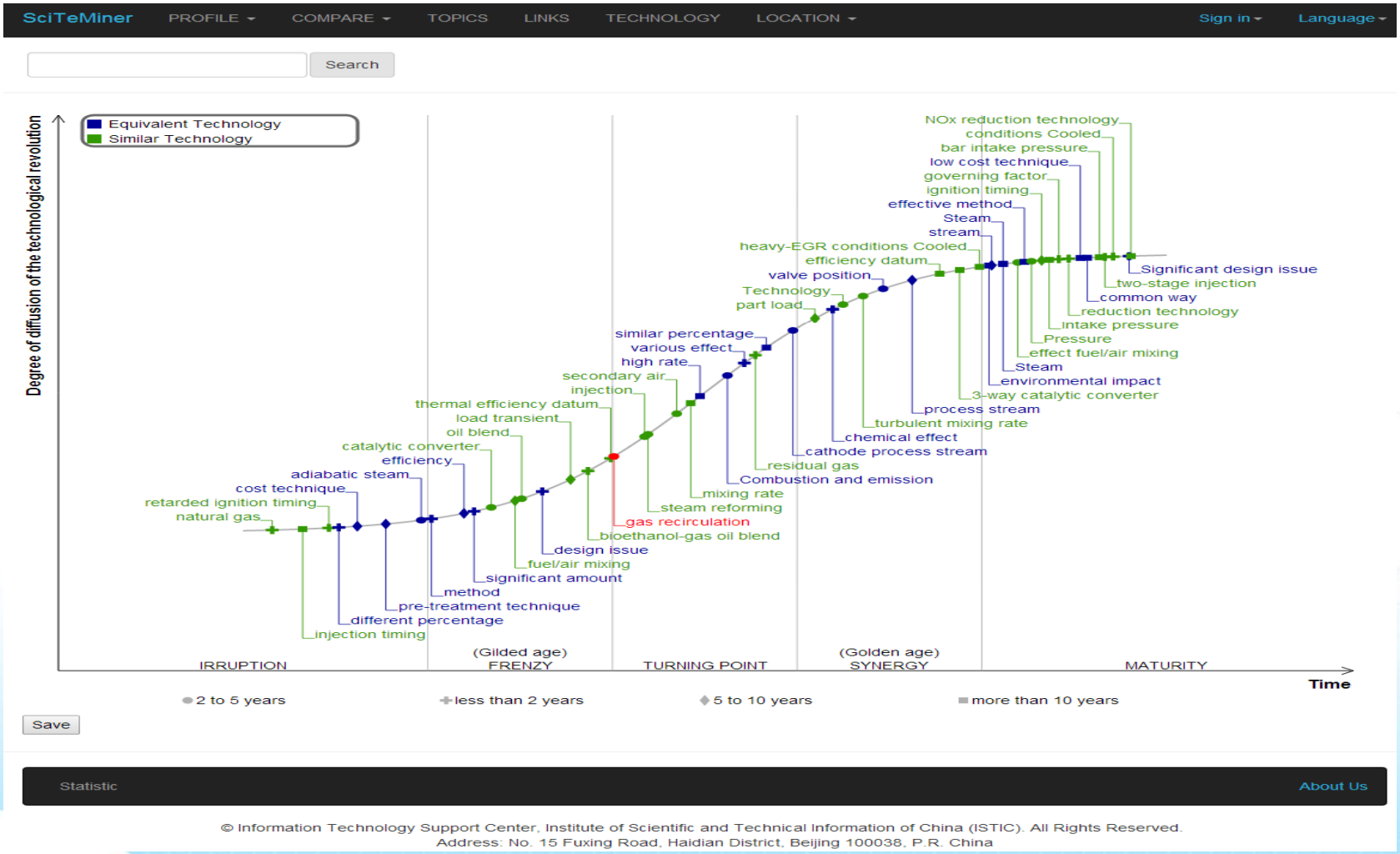


Technical Terms

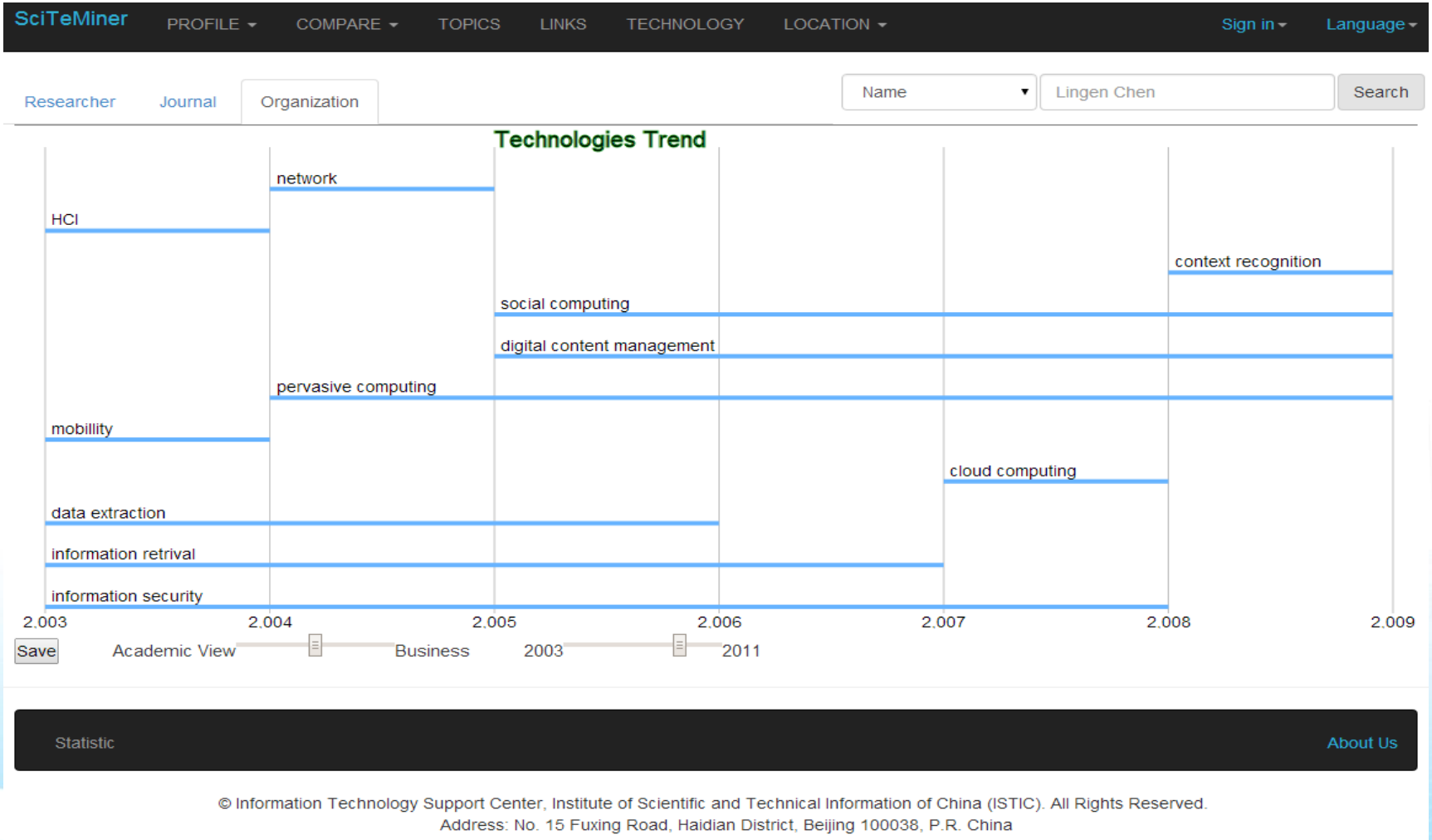
Features



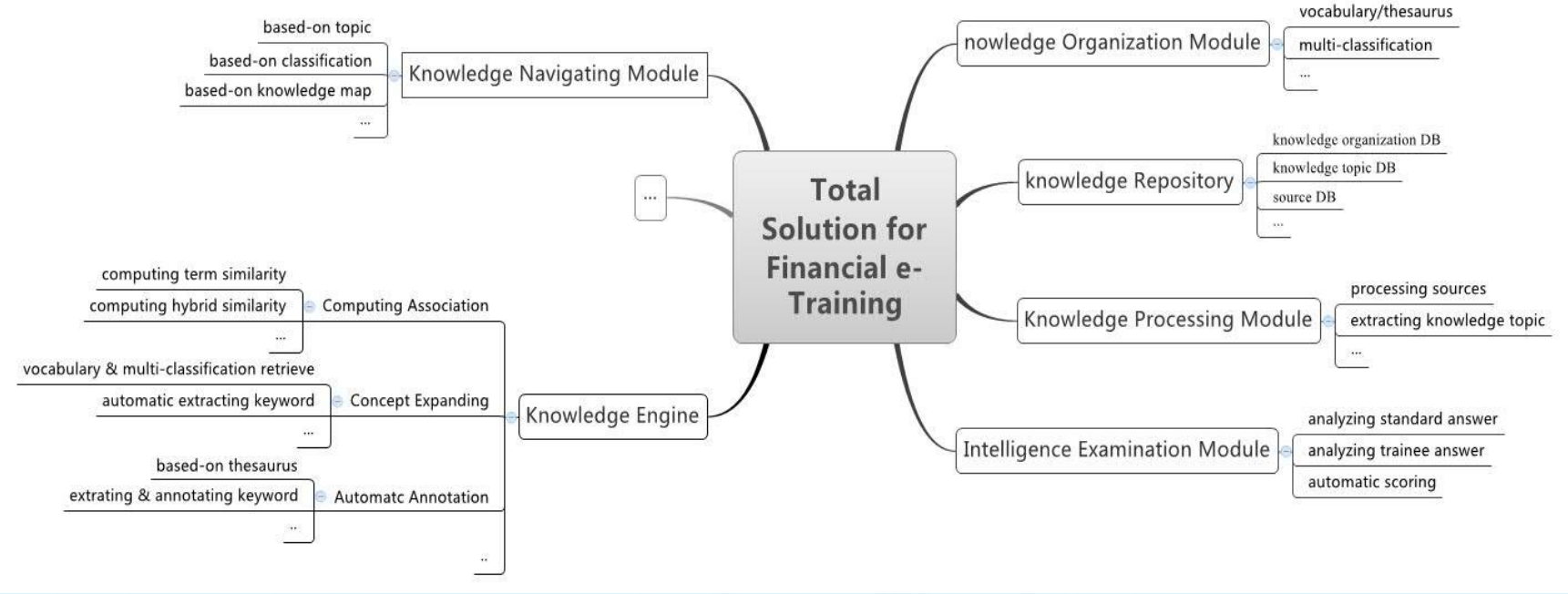
Analyzing Technology Life Cycle (3/4)



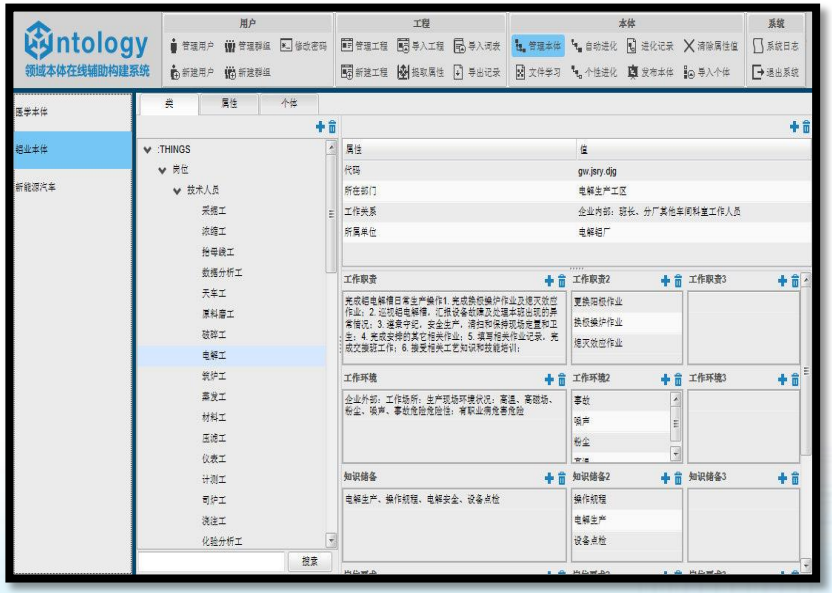
Analyzing Technology Life Cycle (4/4)

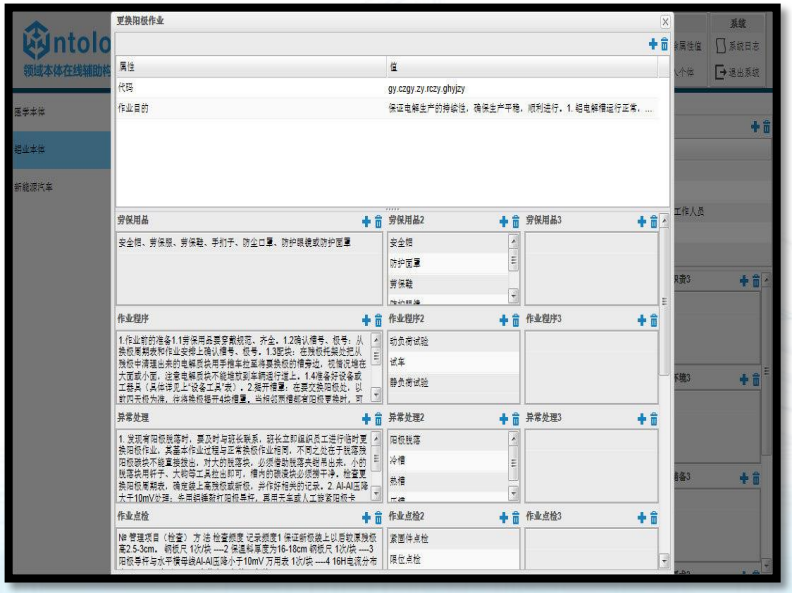


Financial Training Knowledge System



Manufacturing Industry Knowledge System





4. China-Japan-Korea Cooperation

Current：

- China-Korea

  Monitoring Technical Trends

- China-Japan

  Cooperative Research on Japanese-Chinese Bidirectional Practical Machine Translation for Scientific and Technical Literature

Future ：

China-Japan-Korea Multilanguage STKOS

…

STKOS

Thank you for your kind attention

ご清聴、ありがとうございました

XieXie == （谢谢）