The Interface Design for Dissemination of Science and Technology Information based on Semantic Web

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KISTI ISRL
Pyung Kim, Mikyoung Lee*, Namang Kuh, Seungwoo Lee,
Insu Kang, Hanmin Jung, Wonkyung Sung

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Contents

- Overview of OntoFrame-K ®
- Goals
- Science and Technology Ontology
- Knowledge management
- Knowledge expansion
- User interfaces
- Conclusions

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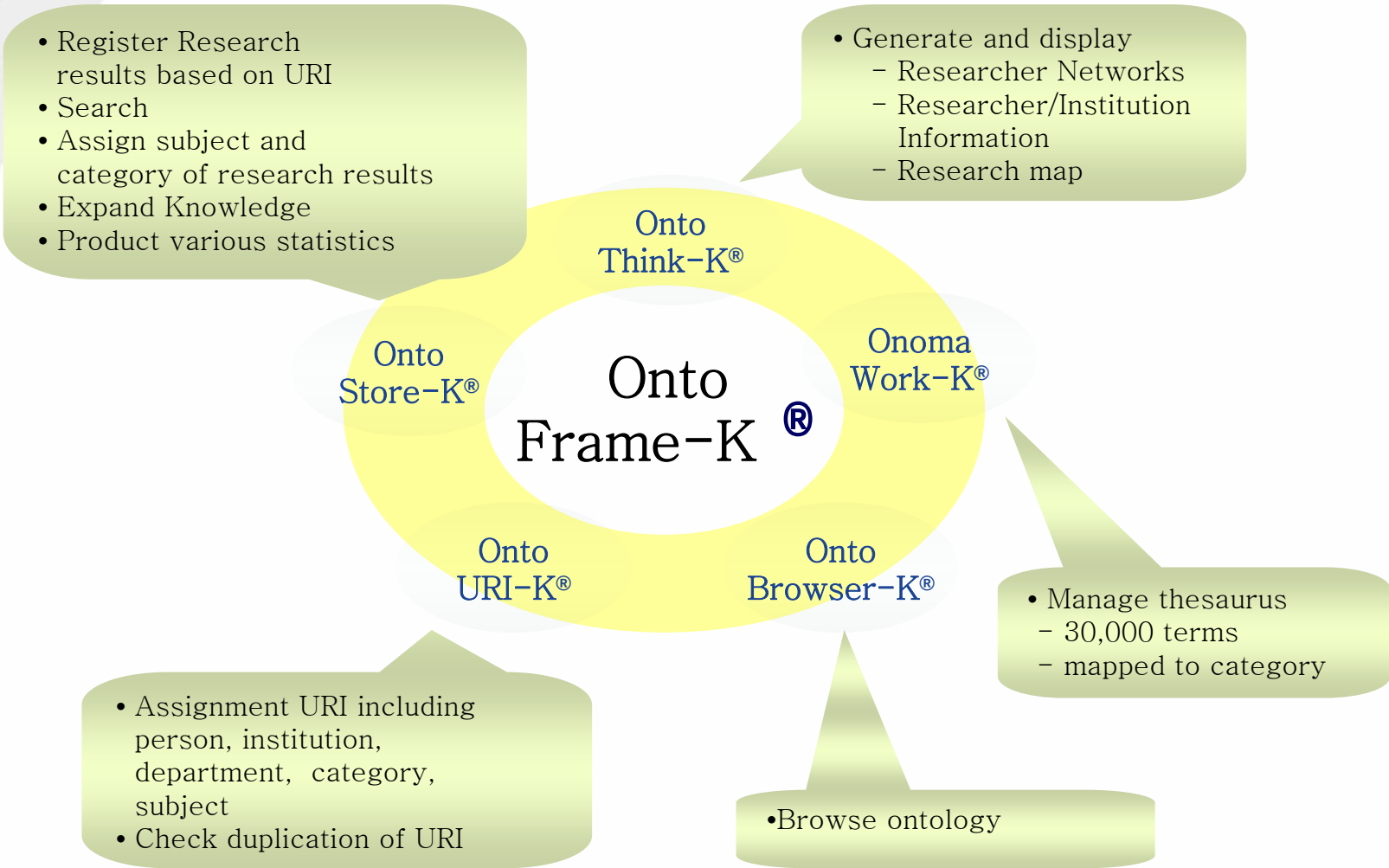
Overview of OntoFrame-K®



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Goals

- Goals
  - Provide a infrastructure for science and technology information using ontology
  - Make a valuable knowledge from research results
  - Treat a mass knowledge information
  - Develop useful scenarios and interfaces for researchers to effective use
- Approaches
  - Manage resources based on URI
  - Expand knowledge using knowledge expansion rules
  - Convert knowledge to RDF triples and manage RDF triples using DBMS
  - Convert SPARQL query to SQL query

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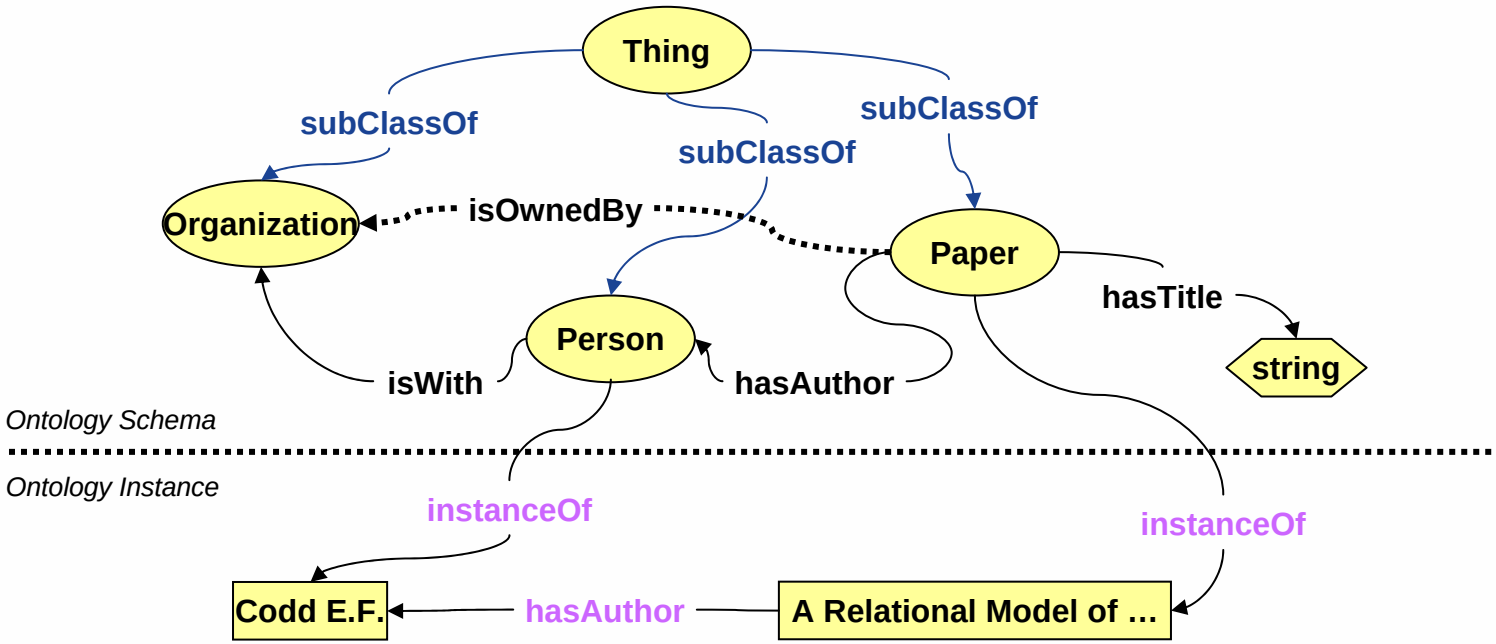
Science and Technology Ontology

- Ontology
  - Core class: Person, Organization, Project, Outcomes (Paper, Patent, Report), Publication (Journal, Proceedings), Topic, CreatorsInformation, Location



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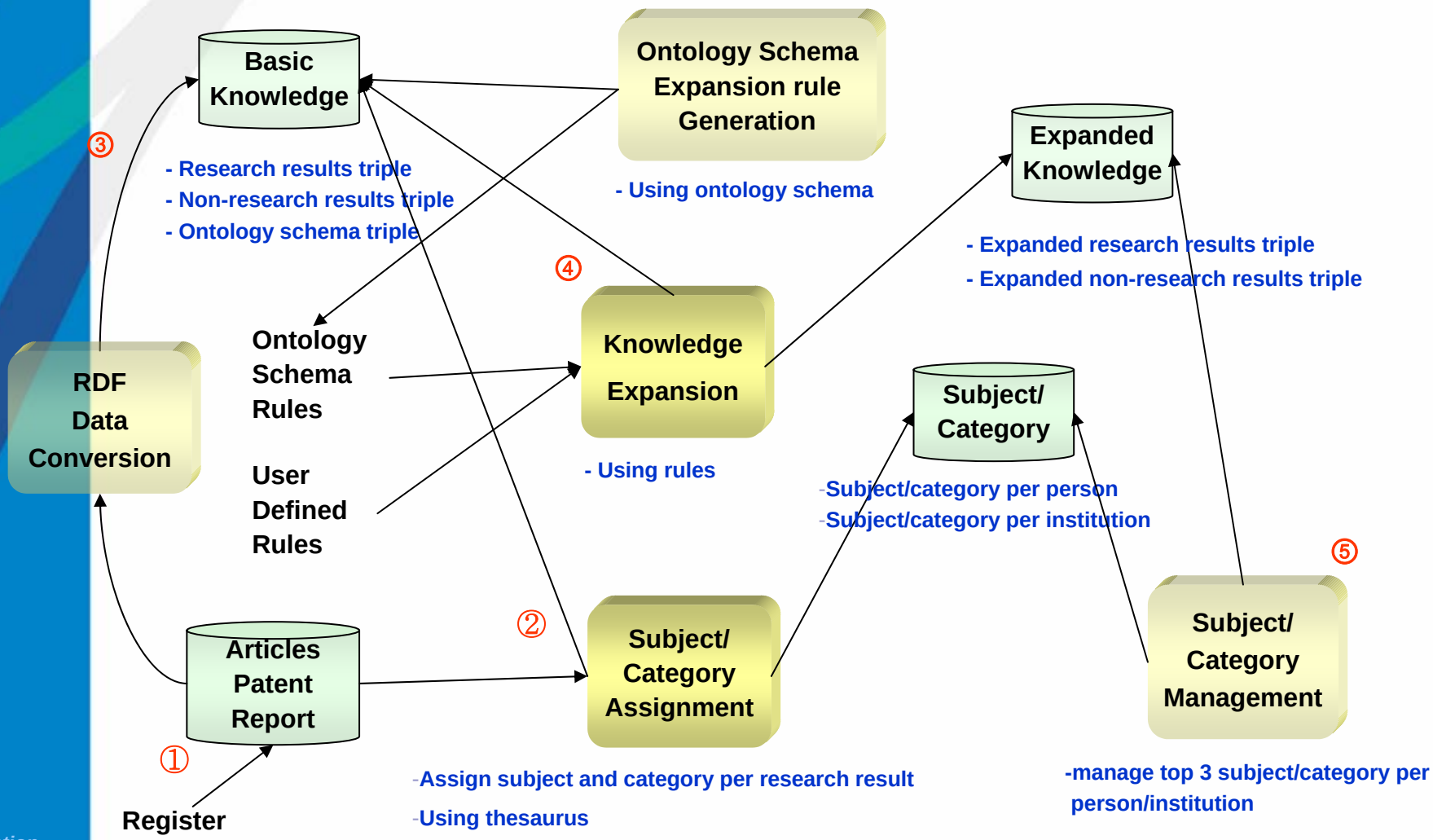
Knowledge management 1/2



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Knowledge management 2/2

- Knowledge expansion
  - Using 22 expansion rules
  - Ontology schema rules and user defined rules
    - x hasCreationInformation y, y hasCreator z -> x createdByPerson z
    - x hasInstitutionOfPerson y, y hasLocationOfInstitution z -> x locatedIn z
    - x createdByPerson y -> y creatorOf x
  - RDF triples: 1.6 million
- Manage RDF triples using DBMS
  - To handle a mass of RDF triples

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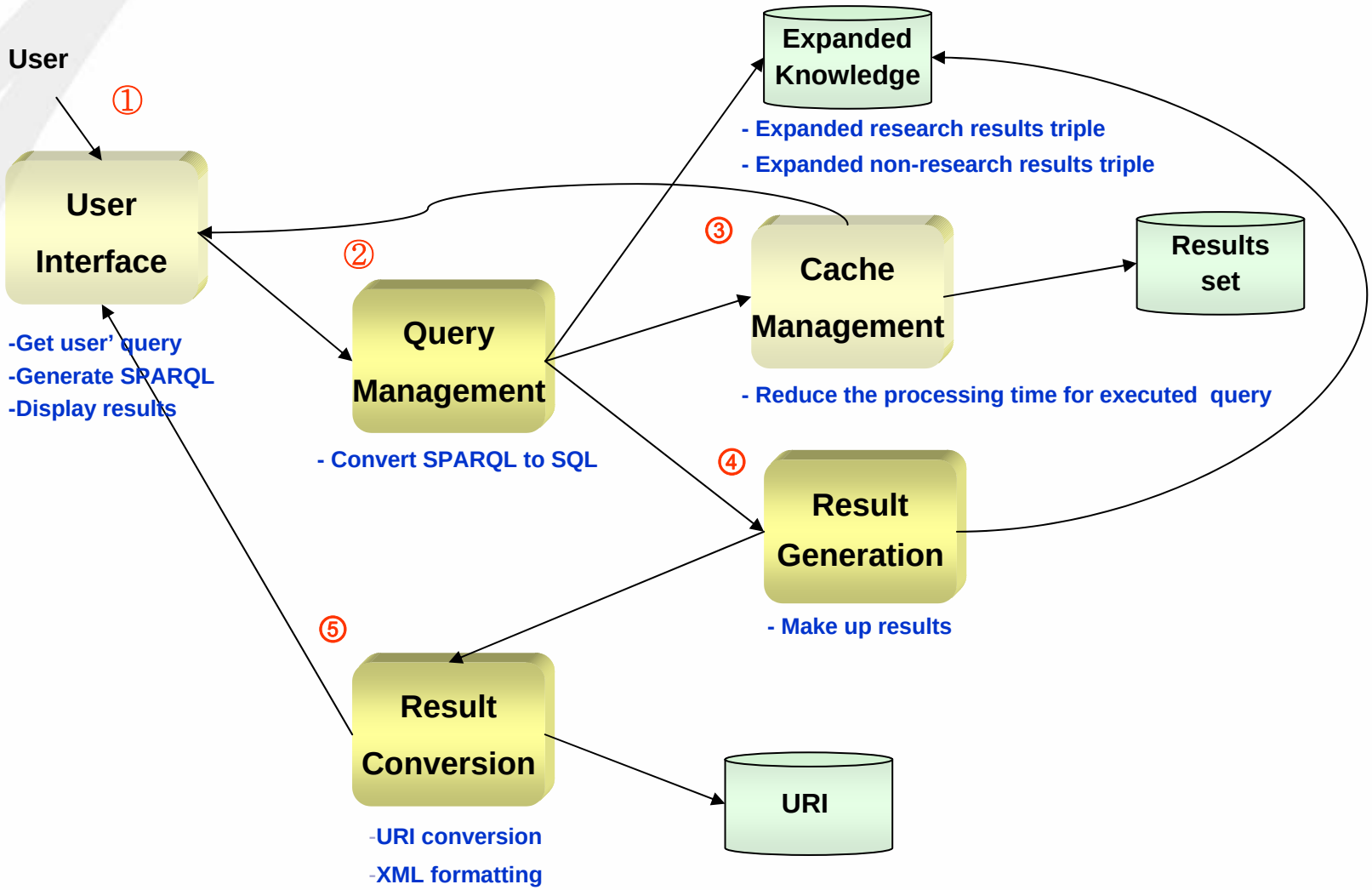
Query Processing



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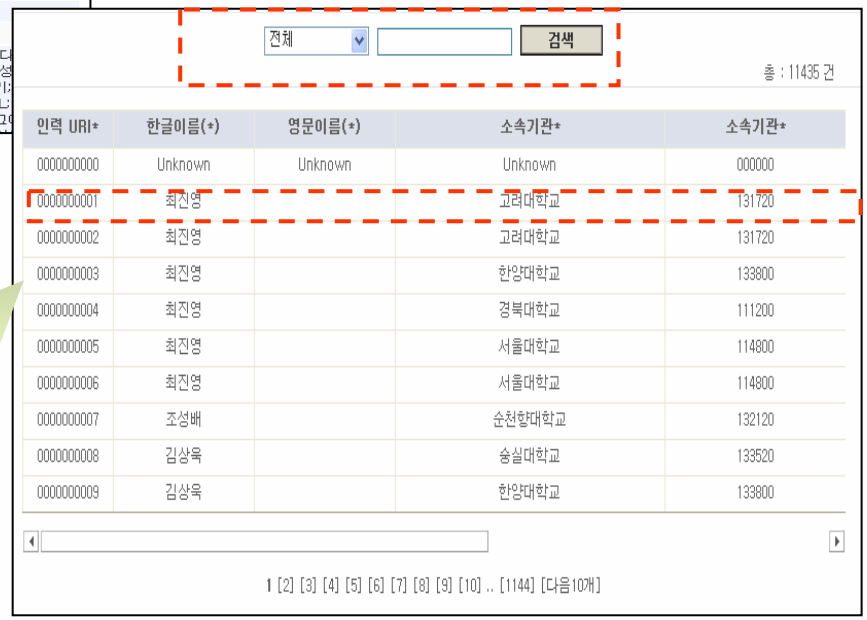
User interfaces 1/5

- CRUD meta data of research results based on URI
- Assign subject and category
- Expand knowledge using inference rules



- Register URI and search URI
- URI including person, institution, department, source, subject, category
- Check duplication

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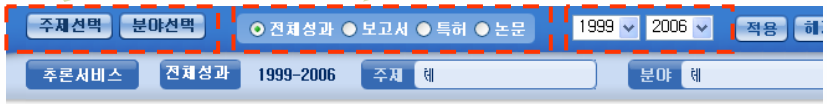
User interfaces 2/5

• limit on subject and category

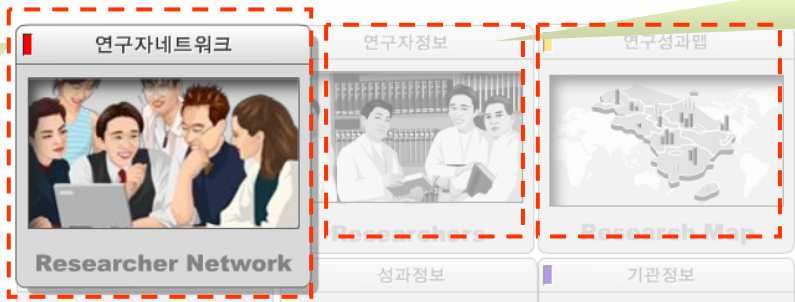
• limit on type of research result

• limit on year of research result



• Display the information of researchers

•Display the expert lists and researcher networks



• Display the research map by location

• Display the statistics of research results by year

• Display the information of institutions

• Display the list of research results

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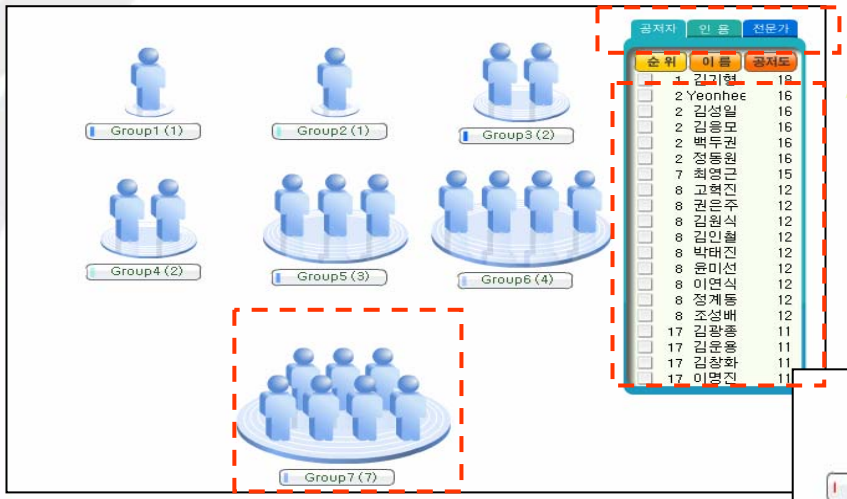
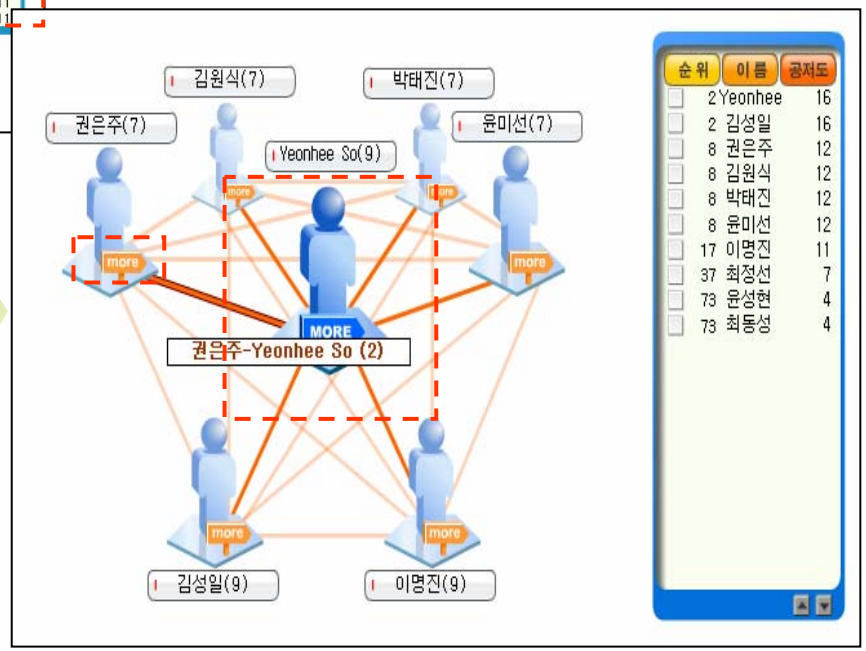
User interfaces 3/5

Researcher Networks



- Group the researchers that took part in research results together
- Display the groups with the number of researchers
- Display Expert list, coauthor network and citation network



- Display the connection and degree of connectivity between researchers
- Limit the number of researcher to 7 and click 'more' to select other researcher
- The thickness of line represents degree of connectivity between two researchers

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User interfaces 4/5

Researcher Information

- Search researcher
- Display the information of researchers
- Suggest top 3 subjects and categories per researcher

Institution Information

- Search institution
- Display the information of institutions
- Suggest top 3 subjects and categories per institution

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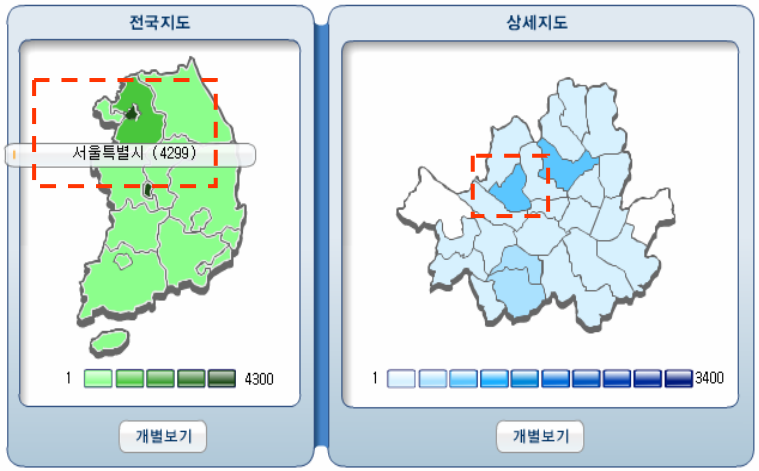
User interfaces 5/5

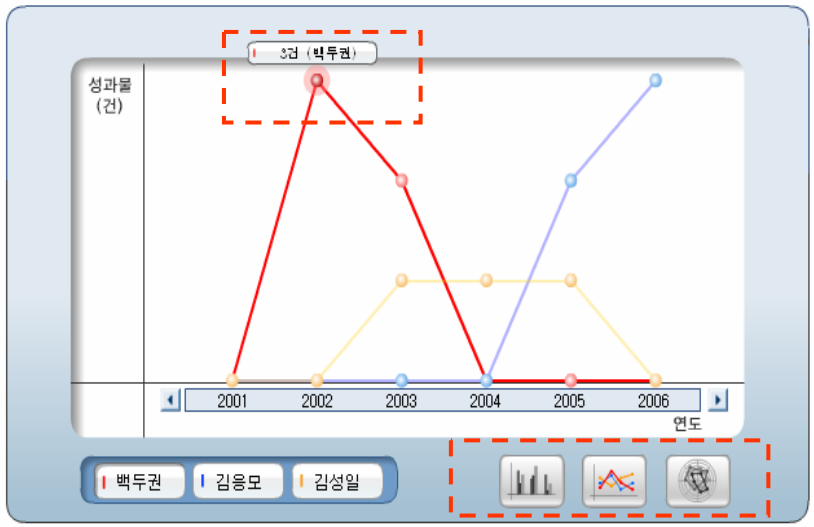
Research map



- Separated by two level map
- Display the research results by location
- The depth of color represents the main area that generated research results

Statistics Information

- Display the statistics of researcher' works by year
- Limit the number of researcher to 3
- Select one of 3 types of chart
- every points represent the number of research results



Information System Research Lab

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Conclusions

- Conclusions
  - Provide a infrastructure for science and technology information using ontology
  - Provide easier, more effective services
  - Generate knowledge from a different standpoint
- Future works
  - Enhance the accuracy and speed on performance
  - Create more robust, more effective services
  - Apply to foreign languages
  - Cover a mass of research results

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