Towards a Big Data-as-a-Service for Legislative Research in the National Assembly Library of Korea

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Data Convergence Analysis Division
1. The **Fourth Industrial Revolution and Data**

2. 2016 **NAL’s Activities for the Big-Data Service**

3. **Intelligence Legislative Support Service Platforms**

4. **Conclusion**
1. The Fourth Industrial Revolution and Data

Source: Ministry of Science, ICT and Future Planning
2. 1 Establishment of Legal and Institutional Foundation

- Amend the NAL Act and the Decree of NAL Organization
- Establish New Division “Data Convergence Analysis Division”
2. 2 Open the Pilot System of Academic Information Convergence in the Cloud

- Expert’s massive ideas into the Legislative Department
2. 3 Building Nal’s Strategies for Intelligent Information Services

**Intelligent Legislative Support Service**

### Purpose
- Data Hub to Collect, Access, and Share Various Types of Data
- Library to Offer Intelligent Information Services

### Strategic Plan
- Build Big Data Analysis Platform
- Provide Innovative Intelligent Information Service Based on Big Data Analysis and AI

BIG DATA + AI
2. 4 To accomplish the Big data Service successfully

1. Transform Various Types of Digital Files into Text Data
   - TEXT DATA

2. Extract Valuable Data from the Full-Text such as Tables, Figures
   - DATA REUSE

3. Build a Platform Internal-External Data Convergence and Analysis
   - PLATFORM

4. Evolve the Big Data Service into the Intelligent One
   - SERVICE

DATAFICATE

EXTRACT

BUILD

EVOLVE
3. 1 Current Challenge of the National Assembly Library

- Rising Demand

![Bar Chart](http://likms.assembly.go.kr/bill/main.do)

- Number of Introduced Bills 1996-2016

### 3. 2 Intelligent Legislative Support Services

<table>
<thead>
<tr>
<th>Service</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>National Academic Information in the Cloud</strong>  - Open and Share Nal's Data Nationwide  - Converge Academic Information Based on Authors and Share Authority Database</td>
<td>National Assembly Members and Their Staff</td>
</tr>
<tr>
<td><strong>Graph and Table Material Service</strong>  - Extracted data from Full-Text  <strong>Infographic Service</strong>  - Provide Big Data Visualization Report</td>
<td>Library Users</td>
</tr>
<tr>
<td><strong>AI Information Service</strong>  - Develop an AI Q&amp;A Robot System for Reference Service</td>
<td></td>
</tr>
</tbody>
</table>

**Legend:**
- National Assembly Library
- National Assembly Members and Their Staff
- Legislative Support Organizations
- Library Users
3. 3 National Academic Information Service in the Cloud (1)

- http://cloud.nanet.go.kr
3. 3 National Academic Information Service in the Cloud (2)
3. National Academic Information Service in the Cloud (3)

**Topic map**

**Scholar’s map**
3. 4 Intelligent Legislative Support Service Platform (1)

• Search and Analyze Hot Issues

<table>
<thead>
<tr>
<th>ISSUE KEYWORD</th>
<th>2017/03/24 16:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 대선후보 TV 토론</td>
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</tr>
<tr>
<td>2 Fine Dust</td>
<td></td>
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<tr>
<td>3 북한 인권결의안</td>
<td></td>
</tr>
<tr>
<td>4 농협 총기장도</td>
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</tr>
<tr>
<td>5 미국 북한 핵 시설 탐지</td>
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</tr>
<tr>
<td>6 5월 황금연휴 근무</td>
<td></td>
</tr>
<tr>
<td>7 프랑스 대선</td>
<td></td>
</tr>
<tr>
<td>8 원달러 환율</td>
<td></td>
</tr>
<tr>
<td>9 삼성전자</td>
<td></td>
</tr>
<tr>
<td>10 청와대</td>
<td></td>
</tr>
</tbody>
</table>

Positive/Negative
- Positive: 209
- Negative: 8,703
- Neutral: 58
- Other: 105
- Total: 9,075

Related Words
- Sulfur Dioxide
- Nitrogen Dioxide
- PM
- Environmental Standards
- Fine Dust
- Air Quality
- Concentration
- China
- Ozone
- Air Pollution
- Yellow Dust
- Gas Emission
- Heavy Metals
- Air Purifier

Related News
- 전북지역 미세먼지 70% 중국에서 옮겨온다
- 박중명 중앙대 병원 교수, 미세먼지로 인한 피부 노화 개선 후보 물질 발굴 나선...
- [취재파일] SBS·한국대기환경과학회 미세먼지 10대 정책 과제
- “미세먼지 병력인대 야외활동?” … 육아 맘들 ‘부금부글’
- 노원구, 미세먼지 유방… 비산먼지 사업장 점검
- 사설-미세먼지 대책 관계당국 미리 맞대라
- 연합뉴스
- 조선비즈
- SBS
- 연합뉴스
- 뉴스1
- 경남도민신문
3. 4 Intelligent Legislative Support Service Platform (2)

• Trend Analysis

**Keyword** Election Law

<table>
<thead>
<tr>
<th>News Analysis</th>
<th>SNS Analysis</th>
<th>Policy Information</th>
<th>Academic Information</th>
<th>Legislative Information</th>
<th>Statistics Information</th>
<th>Legal Information</th>
</tr>
</thead>
</table>

**Related Words**

- Academic Journals
- Registered (Candidate) Academic Journals
- Other Periodicals
- Foreign Academic Articles

**Experts in the Field**

- Academic Journal (419)
- Registered (Candidate) Academic Journal (125)
- Other Periodicals (163)
- Foreign Academic Articles (0)

공직선거법 제82조의6 제1항 등(분인확인조치) 위헌확인 등 = Adjudication on constitutional court against public office election act article 82-6(1): identification of real names on bulletin boards or chatting pages, etc. of internet press agencies / 김래영

- See the Article

선거법은 바뀌어야 '다만' 멤질형 뿐이다: 1958년 개정 때 '규제' 등장 이후 모순과 충돌 많아 선관위 임집 거쳐 / 박은하

- See the Article
3. 4 Intelligent Legislative Support Services (3)

- Bill Analysis

**Bills Sponsored By A - Total 134 Bills**

- Legislation and Judiciary
- Security and Public Administration
- Agriculture, Food, Rural Affairs, Oceans and Fisheries
- Environment and Labor
- Education, Culture, Sports and Tourism
- Trade, Industry and Energy
- Land, Infrastructure and Transportation

**Analysis Information on 「Revision to Act of Origin Labeling of Agricultural and Fishery Product」**

**Analysis of Public Sentiment**

- Positive
- Negative
- Neutral
- Other
3. 5 Table and Figure Service

Extract Tables and Figures From the Full-text of the Digital Library and Provide them to Users

- **Graph**

- **Table**

<table>
<thead>
<tr>
<th>년도</th>
<th>구분</th>
<th>연도별 가계부채 및 증감율</th>
<th>금융부채 보유가구의 총자산, 총부채, 순자산 분포</th>
<th>금융부채 보유가구의 가구별 연령 및 가구원수</th>
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<tr>
<td>2013</td>
<td></td>
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<td>금융부채 보유가구의 가구별 연령 및 가구원수</td>
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<td>2014</td>
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3. 6 Info-graphic Service

Example of a Big Data Visualization Report

01. 가계부채에 대한 전문지식정보 연관이 분석 순위

02. 가계부채 연구동향 분석

03. 가계부채 정책동향 분석

04. 가계부채 인구동향 분석

05. 가계부채 인구동향 분석

06. ‘가계부채’ 소스동향 분석

07. ‘가계부채’ 종합 분석

NATIONAL ASSEMBLY LIBRARY
3. 7 ExoBrain Project for Intelligent Service (1)

“ExoBrain” means an Artificial Brain Outside the Human Body.

【 Working with ETRI 】

Working with ETRI which is developing Korean AI software, ExoBrain

*ETRI (Electronics and Telecommunications Research Institute)

【 How to solve 】

Developing an intelligence-evolving wise QA software that can solve QA problems and communicate at a professional level by understanding the meanings of natural language and by self-learning
3. 7 ExoBrain Project for Intelligent Service (2)

Adopting ExoBrain to Support and Legislative Researchers and Legal Professionals

- Prospect

![Development Prospect Diagram]

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(Technology development)</strong></td>
<td><strong>(Applied technology development)</strong></td>
<td><strong>(Global technology development)</strong></td>
</tr>
<tr>
<td>Exobrain SW for general knowledge convergence answer analysis</td>
<td>Exobrain SW for professional knowledge convergence collaboration-based answer inference type</td>
<td>Exobrain SW for multidomain global knowledge convergence problem solving type</td>
</tr>
<tr>
<td>Challenge project contest for proof of concept (EX: quiz contest, examination pass)</td>
<td>Commercialization in professional areas (EX: medicine, laws, finance)</td>
<td>Commercialization of global problem solving (EX: prediction)</td>
</tr>
</tbody>
</table>
National Assembly Library’s Mid-Term Plan

• Development steps

1. STEP 2 (2018)
   • Develop New Big Data Services

2. STEP 3 (2019)
   • Establish Governance Systems for Big Data

3. STEP 4 (2020)
   • Evolve Intelligent Information Service

For the Better Service