SciVal Spotlight and Implications to University and National Research Strategy

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Elsevier, Science and Technology
Goki Ishikawa
What is “SciVal”?

Overview of “SciVal”

◆ “SciVal” stand for **Science Evaluation**.
   It is a set of solutions developed by Elsevier to provide data and implications to people in charge of **research management**, so that they can make strategic decisions in this time of environmental change.

◆ As the first solution, Elsevier launched **“SciVal Spotlight”** in **June 2009**.
   SciVal Spotlight is a **visualized** solution of **individual institution/nation’s research competencies**, analyzed based on **publication data** from **Scopus**

◆ Today, a year after launch, **30+ research institutions globally have purchased** and **100+ institutions have trialed this new solution**
  
  ◆ **National Chiao Tung University** and **National Taiwan University** have purchased, in Taiwan
Scopus used due to its broad coverage

High coverage of Science, Technology, Medical and Social Science publication

- More than 18,000 journal titles from 5,000+ publishers globally (also including non-Elsevier journals)
  - Worldwide coverage: 70+% of sources outside of United States
  - Peer-review and English Abstract are required to be included
  - More than 50+ Taiwanese journals included
  - 38 million records (70% including abstract)
- Extended Conference Coverage
  - 520 serial conference proceedings and 3 million conference papers
  - 100% coverage of MEDLINE
- Used by many prestigious institutions, globally and in Asia Pacific

What we can understand (1):
Distribution of Competencies

Source: SciVal Spotlight Institution Map 2008

More than 60 global competencies, mainly in Computer Science, Physics and Social Science
What we can understand (2)-1: Detail of Competencies

Positive growth globally, but publication share of this university is decreasing

⇒ Possibility of intense competition? Do we need to further strengthen this field?

Source: SciVal Spotlight Institution Map 2008

What we can understand (2)-2: Detail of Competencies

Source: SciVal Spotlight Institution Map 2008
What we can understand (3): Portfolio of Strengths

How can we shift a relatively high growth competency to the top right segment?

Source: SciVal Spotlight Institution Map 2008

What we can understand (4): National Level Analysis

Compare competencies at national and institutional level

Three Examples on how SciVal data can be used

Three Examples

1. Competitive Funding: Are we getting enough funding on our strength areas?
2. Contribution to National Research: How much of our research are contributing to creation of our national strengths? In which areas?
3. Collaboration with Top Universities: Are we collaborating with global top universities in areas which we are strong?

• What are “Practical” ways we can use these data on a daily basis?
• How are top universities in other part of the region trying to use these data?
Example 1: Identifying opportunities to gain competitive funding

Challenges

How can we further gain more competitive funding from government?

- Are we gaining enough funding in areas we have strengths?
- What can be the logic and data we can use, when requesting for further funding from funding agencies?

Solution (Example)

SciVal Spotlight competencies

Past Funding Result (Data)

Step 1: Identify Detailed information for each competency

11 Global Competencies identified related to Life Science

Detailed information for each competencies

Source: SciVal Spotlight Institution Map 2007
Step 2: Match past funding result per competency

<table>
<thead>
<tr>
<th>Researcher</th>
<th>What Topic</th>
<th>When</th>
<th>$$</th>
<th>Past Funding per Researcher</th>
</tr>
</thead>
<tbody>
<tr>
<td>ResearcherA</td>
<td>Search for new protein to improve drug delivery</td>
<td>2006-2007</td>
<td>3,930,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherA</td>
<td>Analysis of brain function in patients with alimentary tract disorders</td>
<td>2006-2007</td>
<td>3,930,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherB</td>
<td>Establishing a system in microbiological analysis</td>
<td>2006-2007</td>
<td>3,640,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherB</td>
<td>Establishing of a high throughput screening system for overexpression of hybridoma cells</td>
<td>2006-2007</td>
<td>2,980,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherC</td>
<td>Study of spermatogenesis and spermatogenic cell generation</td>
<td>2006-2007</td>
<td>17,300,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherC</td>
<td>Systematic identification of functional anomalies in human atrial myocytes</td>
<td>2006-2008</td>
<td>4,130,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherD</td>
<td>Molecular biological study of non-endemic bacteria in deep sea</td>
<td>2006-2008</td>
<td>12,900,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherD</td>
<td>Vertebrate systematics based on generation of endosymbiont endosymbiosis</td>
<td>2006-2008</td>
<td>19,100,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherE</td>
<td>Identification of biological system for neuroscience</td>
<td>2007-2008</td>
<td>8,990,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherE</td>
<td>Study of creation of a chemotherapy discriminative and pattern recognition system</td>
<td>2007-2008</td>
<td>2,790,000</td>
<td></td>
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<tr>
<td>ResearcherE</td>
<td>Biological impact of high resolution of affinity and application to signal processing</td>
<td>2007-2009</td>
<td>19,240,000</td>
<td></td>
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<tr>
<td>ResearcherF</td>
<td>Establishing of a new basis for signal processing based on spatiotemporal scale</td>
<td>2007-2009</td>
<td>10,270,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherF</td>
<td>Indexing and formation of a new basis for neural networks in complex materials</td>
<td>2008-2010</td>
<td>7,400,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherG</td>
<td>Basic research for protection of genotoxic through xenon chemistry of alkenylic protein</td>
<td>2008-2010</td>
<td>3,770,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherG</td>
<td>Basic research related to integration of material science and chemical chemistry</td>
<td>2008-2010</td>
<td>1,520,000</td>
<td></td>
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<tr>
<td>ResearcherG</td>
<td>Research on ultra-high density spinning enthalpy of sequential optimization function</td>
<td>2008-2010</td>
<td>1,750,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherH</td>
<td>Identification of a new functional and dynamic assembly of an integrated system</td>
<td>2008-2010</td>
<td>3,040,000</td>
<td></td>
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<tr>
<td>ResearcherH</td>
<td>Threshold high-order transformation and control for neural networks in complex materials</td>
<td>2008-2010</td>
<td>6,450,000</td>
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<tr>
<td>ResearcherI</td>
<td>Gene reaction toward a biological clock circle type environment time scale</td>
<td>2008-2010</td>
<td>15,550,000</td>
<td></td>
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<tr>
<td>ResearcherJ</td>
<td>Identifying new function to control the functions of the biological clock</td>
<td>2008-2010</td>
<td>15,190,000</td>
<td></td>
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<tr>
<td>ResearcherK</td>
<td>Identification of new patterns to control the biological clock of mice</td>
<td>2008-2010</td>
<td>2,990,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherL</td>
<td>Development of an easy-to-use mouse transplantation to improve daily functions for old</td>
<td>2007-2009</td>
<td>15,760,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherM</td>
<td>Classification of role of metabolism in enhancement of mouse biological clock</td>
<td>2008-2010</td>
<td>15,730,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherN</td>
<td>Establishment and application of new methodologies</td>
<td>2007-2004</td>
<td>1,000,000</td>
<td></td>
</tr>
<tr>
<td>ResearcherO</td>
<td>Mechanism of transcription and regulation of stress</td>
<td>2007-2009</td>
<td>6,130,000</td>
<td></td>
</tr>
</tbody>
</table>

Source: SciVal Spotlight Institution Map 2007, Japanese Government Funding Database

Step 3: Identify Underfunded Competencies

<table>
<thead>
<tr>
<th>Funding Situation per competency</th>
<th>Positioning within Strength Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in Funding or continuing project</td>
<td>5</td>
</tr>
<tr>
<td>Decrease in Funding</td>
<td>3</td>
</tr>
<tr>
<td>No Funding gained individually</td>
<td>3</td>
</tr>
</tbody>
</table>

Strengths in Life science related subject areas n=11
Underfunded strength areas n=6

Source: SciVal Spotlight Institution Map 2007, Analysis
Example 2: Contribution to creation of national strength

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Solution (Example)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is our university research contributing to the creation of national strength?</td>
<td>Institutional Competency</td>
</tr>
<tr>
<td>◆ Which areas are our national strength areas? Are our researchers contributing in those research activities?</td>
<td>National Competency</td>
</tr>
<tr>
<td>◆ Does our university have presence in areas of future national focus?</td>
<td></td>
</tr>
</tbody>
</table>

Step 1: Identify competency of your university

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Source: SciVal Spotlight Institution Map 2008
Step 2: Identify related national level competency

Example


Step 3: Look into top institution and researcher in this competency

Example

Example 3: Identifying Collaboration opportunities

**Challenge**

How can we collaborate with other universities to effectively build up our research competencies?
- In what areas do we have overlap of strengths with top univ like Harvard/MIT? In which areas are our researchers publishing papers with Harvard/MIT researchers?
- In which areas do we have potential to collaborate with Harvard/MIT and other top univ?

**Solution (Example)**

Step 1: Look into detailed information for each competency

**Example**

- **Global Top Institutions**
- **Only Collaborating Institutions**

Source: SciVal Knowledge Network 2008

Your researchers are not publishing together with Harvard researchers, although both institutions have strengths in this area.
Step 2: Organize result gained from each competency

Number of Competencies

- Total number of competencies at your institution: 58
- Overlapping strength areas between your institution with Harvard/MIT: 8
- Areas where your institution and Harvard/MIT researchers are publishing together: 7

How can we facilitate collaboration in these seven areas?
- What discipline?
- Who are top researchers in our university?
- Who are global top researchers? etc.

Step 3: Identifying Collaboration opportunities

What is this area about?
- Publication size/growth
- Related Discipline, Keyword

Your University’s Info
- Key researchers and activity level
- Advantage towards competitor (quality and quantity)

Competitive information
- Who are the global top researchers?
SciVal Spotlight is a solution based on Scopus, which visualizes research competencies of individual university and/or nation

- More than 30 research institutions have purchased, including National Chiao Tung University, National Taiwan University and Tohoku University

Data in SciVal Spotlight can be used to gain key implications to further strengthen research strategy at university and national management level

- Some examples are:
  
  (1) Gaining more competitive funding,
  (2) Monitoring contribution to national strength creation,
  (3) Identifying collaboration opportunities etc.

- In addition, monitoring change of strengths over time, can provide insight into measuring effectiveness of measures taken in the past
THANK YOU

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