

A Method to Reveal the Research Domains of Different Institutions- the Macro and Micro Features

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Introduction

Currently many evaluations of scientific research institutions use the indicators of macro-evaluation, such as the title of the staff's technical post, the number of published papers, research projects and so on. However, the scientific management based on the evaluation of research results ignores the micro-level features of research institutions. The papers published in journals are seen isolated, but actually there are extensive contacts among them. Each paper consists of several entities including keywords, authors, institutions, journals and so on (Morris, 2005). This research uses a method based on the occurrence of entities in papers to analyze the research domains in a sample of National Science Library.

Methodology

For a research institution, the published papers of its staffs carry the biggest part of its latest scientific research information. By analyzing the occurrence information of entities in published papers, we can easily understand the research domains such as research topics, research groups and the journals types of published papers in research institutions. Therefore, this research designed a method (see Figure 1) to reveal the research domains of institutions from research topics, research groups and journals of published papers and their relationships.

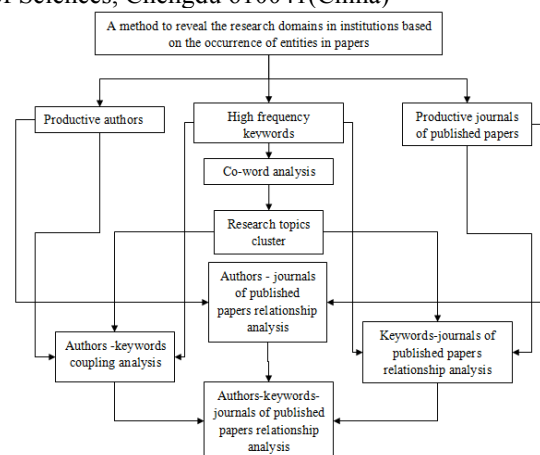


Figure 1. A method to reveal the research domains in institutions

Case study

Sample acquisition and data source

In this research, we selected National Science Library of Chinese Academy of Sciences (NSLC) as a sample, which includes the main library in Beijing, and three branch libraries in Lanzhou, Chengdu and Wuhan (<http://www.las.cas.cn/gkjj/>). We retrieved 1958 published papers of NSLC for the Academic Literature Full-text Database in Chinese National Knowledge Infrastructure(CNKI) which published between 2000-2009 (search date: September 23, 2010).

Results and findings

(1)Top ten authors, keywords and journals
After the calculating of productive authors, high frequency keywords and productive journals in NSLC, we could find out the top ten productive authors, high frequency keywords and productive journals.

(2)Research topics

After the clustering of the high frequency keywords in NSLC, we divided the

keywords into 11 topic groups: digital library; information services; document classification; information research of NSLC and LIS organizations, information systems research, science and technology journals, scientometrics, information resource and information services, development of science and technology, undefined 1 (it contains many kinds of keywords, so we can not define it), user services.

(3)The finding in the relationship analysis among authors, keywords and journals of published papers

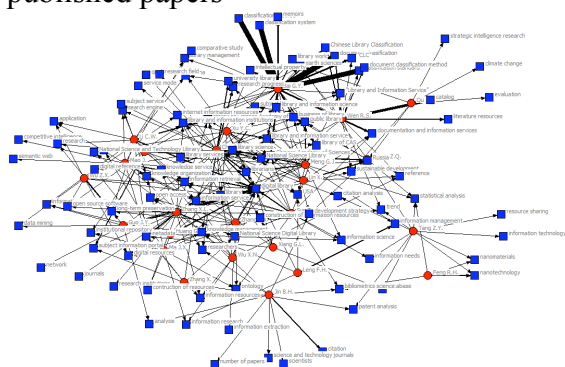


Figure 2. Productive authors-high frequency keywords 2-mode network

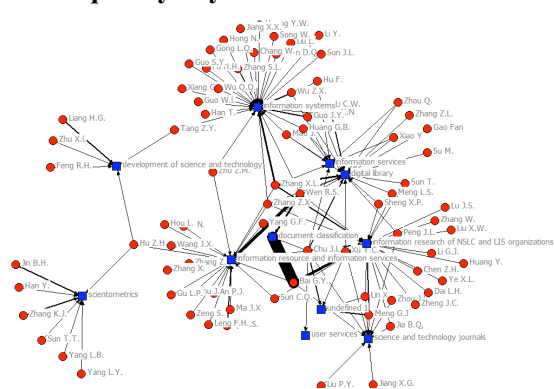


Figure 3. Authors-research topics 2-mode network

In Figure 2 and Figure 3, we could find out the major research fields of productive authors and research groups of certain topics.

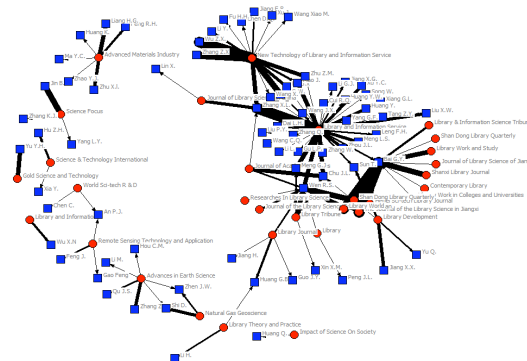


Figure 4. Authors- journals of published papers 2-mode network

In figure 4 we could find out some author groups of certain journals or the journals which authors more prefer publish papers in.

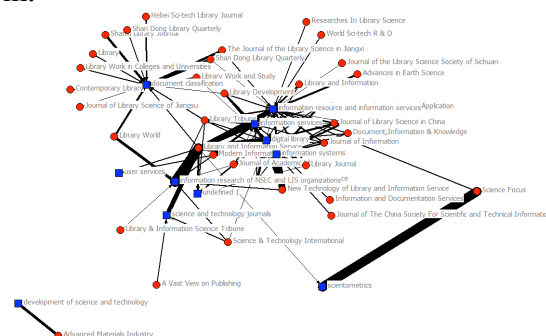


Figure 5. Research topics - journals of published papers 2-mode network

In Figure 5, we could discovery which topics of papers were published in which journals.

Lastly, we analyzed the relationship network of authors-keywords- journals of published papers in NSLC. In this analysis, we select 4 authors and display their research topics and journals of published papers respectively.

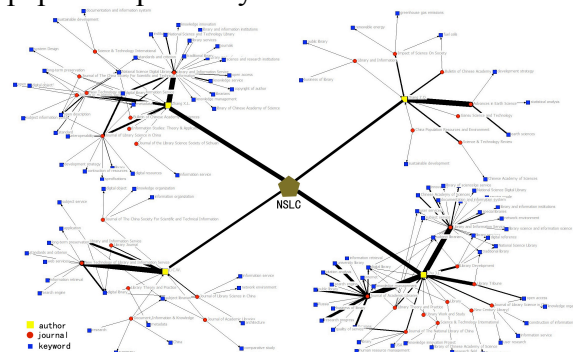


Figure 6. Relationship network of Authors- keywords- journals (4 authors in NSLC)

We defined this phenomenon which involves 3 or more entities as multiple occurrences. By analyzing the phenomenon of multiple occurrences, we could reveal a deeper content, such as the analysis of authors-keywords- journals of published papers could reveal more detailed relationships among these three entities than any two entities. However, the effect of multiple occurrences should be needed further analysis.

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Conclusion and future work

This research proposed a method based on the occurrence of entities in papers for revealing the research domains in institutions. We selected the National Science Library of Chinese Academy of Sciences as a sample. The analysis level was from a single entity (including authors, keywords, journals of published papers) to two occurrence entities (including authors - journals of published papers, authors - keywords, keywords - journals of published papers). And lastly we used the three occurrence entities (authors - keywords - journals of published papers) for experimental analysis of the further information. For this research we found that this method can better reflect the research domains in institutions, such as the research topics, research groups and the type of journals which papers are published in. Moreover, this method can reveal the relationships among researchers, research topics and journals of published papers. However we still need deeper research in the fields of multiple occurrences and use this phenomenon for further analysis.

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