The Interdisciplinary Feature of Knowmetrics

HOU Hai-yan[1] and LIU Ze-yuan[2] and CHEN Chao-mei[3] and WANG Xian-wen[4] and QU Tian-peng5 and LU Chun-ting[6]

1 htieshan@dlut.edu.cn, 2 liuzy@vip.163.com, 4 wangxianwen@sina.com, 5 billqu@163.com, 6 m82052389@126.com
WISE LAB of Dalian University of Technology, 116085, Dalian(China)

3 chaomei.chen@cis.drexel.edu
College of Information Science and Technology, Drexel University, PA 19104-2875, Philadelphia(USA)

Introduction

Taking the whole system of human knowledge as its research subject, knowmetrics is an emerging inter-disciplinary discipline that carries out a comprehensive study of the knowledge capacity of the society and the social relations of knowledge through such methods as quantitative analysis and computing technology. Knowmetrics is an interdisplinary discipline. However, this definition only covers the general research paradigms based on the traditional approach in science of sciences and scientometrics. It involves little of the methodology of measuring knowledge units, which is the key to knowmetric research. The emergence of scientific knowledge map and information visualization techniques presents unprecedented opportunities for the development of knowmetrics.(Chen, 2003, 2004, 2006, Liu, 1999, 2000, 2001, Hou, 2008)

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In order to identify the paradigm of Knowmetrics, we downloaded bibliographic data from the Web of Science. The data contains all types of 171 articles (Document Type=ARTICLE) containing topic terms “Knowledge domain*”, "knowledge visualization", "knowledge visualisation", "knowledge min*" and "domain* visuali*" (Topic="Knowledge domain*" OR "knowledge visualization" OR "knowledge visualisation" OR "knowledge min*" OR "domain* visuali*") between 1999 and 2008. The data of each document includes author names, title, abstract, date, document type, addresses, and cited references. The retrieval was finally updated on Dec 6, 2008.

In order to identify the interdisciplinary feature of Knowmetrics, we drew the co-occurrence map of subject categories (Fig. 1). We noticed that there are 37 subject areas involved in Knowmetrics. Computer science is the main and core subject area, which indicates that computer science is the main tool and method to measure knowledge.

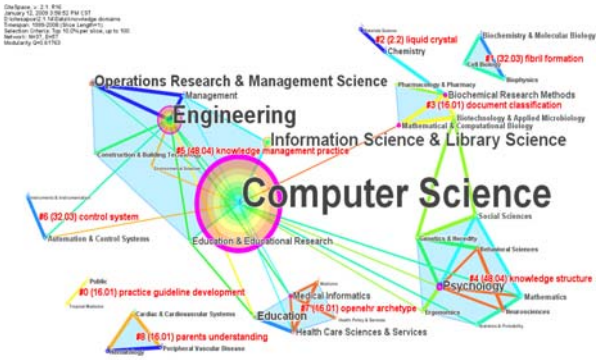

Figure 1. Co-occurrence analysis of main subject areas of knowmetrics, 1999-2008

From Fig.1 and Tab.1, we can identify 8 subject clusters, which are knowledge management practice, knowledge structure, openEHR archetype, document classification, fibril formation, parents understanding, control system, liquid crystal, and practice guideline development. The core and biggest subject cluster is the cluster focusing on knowledge management practice, which includes 8 subject areas: Computer Science, Engineering, Information Science & Library Science, Operations Research & Management Science, Education & Educational Research, Management, Construction & Building Technology, and Environmental Sciences. We noticed that Engineering□Management and Operations Research & Management Science form a triangle relationship of three methodological subject areas, which demonstrate the interdisciplinary feature of Knowledge Engineering.

Another main subject cluster includes 8 subject areas focusing on the structure of knowledge. The core subject in this cluster is Psychology, which indicates that social sciences are also use the methods of knowmetrics and knowledge visualization to measure the structure of knowledge in social structure, especially in human psychology.

The third main subject cluster includes Education, Medical Informatics, Health Care Sciences & Services, Medicine, and Health Policy & Services. The main research field of this cluster is openEHR (EHRs -Electronic Health Records) archetype

(clinic knowledge model) which is a complex knowledge domain to cope with the changing nature of health knowledge, and to be shareable.
knowmetrics is an emerging inter-disciplinary discipline that is still not mature. Appling the theory and methodology of macro-and-micro knowmetrics in the practice of knowledge management, we will carry out extensive knowmetric research based on the new generation of dynamic, multivariate and time-sliced visualization technique, to establish a set of uniform research paradigms of knowmetrics.

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