

中国科学技术信息研究所 论文集 (2009)

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中国科学技术信息研究所 编



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前 言

中国科学技术信息研究所（简称“中信所”）是科技部直属的国家级公益性科技信息研究机构，定位于为科技部等政府管理部门提供决策支持，为科技创新主体提供全方位的信息服务，努力建设成为全国科技情报领域的共享管理与服务中心、学术中心、人才培养中心和网络技术研究推广中心，在全国科技信息系统中发挥指导和示范作用。

按照国家公益类科研院所的改革要求，中信所于2005年实施了深化改革工作。七年来，中信所党政领导班子对科技信息工作的发展规律进行了深入思考，结合自身实际情况及相关实践探索，对中信所的改革与发展工作做出了中长期布局与统筹安排。确定了“落实公益定位，坚持科学管理，服务自主创新，建设一流院所”的工作主线。提出了“三步走”的发展思路，即第一步（2006—2008年）是中信所发展的磨合期，其工作重点是新机构、新业务、新机制之间的调整与完善，确立中长期发展规划；第二步（2009—2011年）是中信所发展的整合期，其工作重点是整合与提升全所优质资源和业务工作，进一步夯实发展基础；第三步（2012—以后）是中信所发展的跃升期，在这个阶段，全所的公益研究与服务水平将稳步提升，并形成具有特色的研究与服务产品。

七年来，中信所启动、开展了一系列基础性、前瞻性工作，为科研人员营造了良好的学术研究环境与学术交流氛围，为科研人员提高学术研究能力、提升学术论文水平奠定了坚实的基础。同时，积极推进资源整合工作，加强了“中国科学技术信息研究所暨国家工程技术数字图书馆网站”、“中国科技情报网”、“中国科技论文统计与分析平台”、“ISTIC专利信息检索与分析平台”和“中国高层次科技人才信息网”等业务支撑平台建设；提出了以事实型数据为基础，综合集成“事实型数据+专用方法工具+专家智慧”的研究方法，明确了中信所必须坚持以事实型数据资源建设为基础，坚持科技情报研究工作的可量化、科技情报研究成果可重现性的业务发展新思路；全面启动了中国科技论文与引文数据库、ISTIC—中国发明专利数据库和中国高层次科技人才数据库等事实型数据库的建设和质量提升工作，加强了知识挖掘、机器翻译、信息可视化等与科技情报研究工作紧密相关的软件工具和模型的研发工作。七年来，中信所坚持开放办所，推动开放联合。加强了与国内重点高校的合作，与南京大学、武汉大学、吉林大学等高校签订了合作协议，开展学术研究、人才培养等方面的深度合作；加强了与国际知名同行机构的合作，与汤森路透科技信息集团合作建立的

了“ISTIC-THOMSON REUTERS 科学计量学联合实验室”，与美国千年研究所合作成立了“ISTIC-MI 联合研究中心”，与爱思唯尔集团联合创建了“ISTIC-ELSEVIER 期刊评价研究中心”，与德国弗朗霍夫系统与创新研究所（ISI）建立了合作关系，与日本科技振兴机构和韩国科技情报研究所保持着制度化的合作交流。七年多来，中信所持续投入、稳定支持科研人员在图书馆学、未来学、科技政策与管理、信息资源管理、知识工程、自然语言处理、情报学、科学计量学 8 个重点学科方向上开展学术探索和研究工作。

经过七年多的不懈努力，中信所学术论文产出已经从数量的快速增长期进入到高产状态下的相对稳定期，收录在国际著名检索数据库中的高质量论文呈现大幅增长态势，已经呈现出从数量增长向质量提升的重大转变。这些成绩的取得，归功于科技部的正确领导，归功于全所上下的共同努力和协同配合，归功于我所广大科技信息工作者的拼搏奉献与忘我工作。

现代管理学之父彼得·德鲁克曾经指出，当今世界已由管理的社会变成了创新的社会，当今社会最具有价值的活动无疑是寻找创新的来源。实践证明，创新是社会发展的前提，是社会进步的强大动力。科技创新的灵魂，就在于开放和交流。科技论文是记录、总结科研成果的重要方式，也是科研人员交流学术思想和科研成果，促进科技知识传播，体现科研工作价值和重要贡献的重要载体。科研院所更是只有通过合作和交流才能实现学术研究的互通有无、取长补短，建立良好的科研文化，提高科研效率，融入时代科技发展的潮流。

本论文集编撰收集了中信所科研人员（含硕博研究生、博士后科研人员）2009—2011 年以中信所为第一作者单位发表的中文核心期刊论文以及被 SCI、SSCI、EI、ISTP、ISSHP 收录的论文共 753 篇，各年度论文集均分为上、下两册，共 6 册，内容主要涉及图书情报研究、战略研究以及其他相关研究等方面，从一个侧面展示了中信所在图书情报基础理论、方法和技术以及科技政策与战略决策、领域分析与研究等学术领域的研究成果。我们衷心希望，这样一部记录我国科技信息事业发展轨迹的重要文集能够在我国科技信息事业发展史上增添浓墨重彩的一笔。

由于编写时间仓促，疏漏和不妥之处在所难免，敬请读者斧正。

中国科学技术信息研究所 所长

贺卫方

2013 年 1 月

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图情研究

Structuring Serials Bibliographic Relationships through ID Linking

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Keywords: linked data; serials bibliographic relationship; information organization

Abstract

Structuring bibliographic relationships of serials through ID linking is a 2009 – 2010 preresearch project led by the Institute of Science and Technology Information (ISTIC) and founded by the National Science and Technology Library (NSTL). The project arises from the needs of integration and reconstruction of NSTL workflow. NSTL, established in 2000 by the Ministry of Science and Technology, is a library federation and STM literature sharing platform consisting of nine special national libraries serving basic science, agricultural sciences, medical sciences, and engineering. The workflow components are comprised of the Union Acquisition System, Union Catalog System, Union Data (abstracts, contents and citations) Processing System, Central Repository and the Union Service System supporting cooperative collection of STM, integrated abstracts retrieval and contents browsing, and interlibrary loan service. The union collection emphasis is on STM journals and proceedings. The Union Catalog System is the origin of the NSTL workflow and the base of resource organization. For the seriality and dynamicity characteristics of serials, describing and structuring the bibliographic relationship levels becomes more and more important in identifying, selecting, and formulating to meet different requirements from other NSTL work systems.

The goal and objectives of the project are: (a) to build structured URI based on FRBR and semantic

relationships for the serials publications; (b) to advance the ability of resource describing and organization of the Union Catalog System; (c) to enhance bibliographic and management intelligence by new insights into resources relationships operating at different levels; (d) to optimally streamline NSTL workflow such as helping the Union Data Processing System to identify relationships and match related metadata; and (e) to support Central Repository and Union Service System by superior presentation of the seriality and dynamicity of the serials in search results.

The key of the project is to structure the relationship between bibliographic records. First, we defined relationship types and relationship hierarchies (see Table 1) based on FRBR and the semantic relationship of the serials. Second, we assigned different hierarchy identifiers and relationship identifiers to every record. The hierarchy identifiers are series ID comprised of Super – Work – ID, Work – ID, Expression – ID and Manifestation – ID. At same time some relationship identifiers are created, librarians can operate at superior level to create junior IDs and link them, such as horizontal relationships. Repeated keying of work – related information is reduced. Other relationship identifiers can be created by librarians linking records and selecting descriptive words such as *continue to*, *merge to*, *split to* and so on (see Figure 1). Then the Union Catalog System can publish those representations using the standard OAI – PMH protocol so that relationships and links can be harvested, stored, searched or browsed anywhere (Rosenberg, 2004).

Table 1 Relationship Types

Class	Sub - Class	Describing
Horizontal Relationship	Super work - work	Relationship between family or aggregation work and individual work
	Work - expression	Relationship between distinct work and different intellectual or artistic realization of work, such as the serial comes out in multiple editions or versions, languages or publishers
	Expression - manifestation	Relationship between physical embodiment and expression of a work, such as different medium
	Whole - part	Relationship between the serial and components monographs or subseries
Parallel Relationship	Chronological RS	Relationship among the serials developing and deriving, such as continuing, superseding absorbing, separating, splitting, merging and so on
	Equivalent RS	Relationship between serials in multiple editions or versions, such as other edition, state or impression in the same medium or different medium
	Accompanying RS	Relationship between a supplement serial and parent serial

Next, we will create URI for different level ID. Following the rules of Linked Data (Berners - Lee, 2006), URI created for each record are persistent and dereferenceable. Then these relationships and

connections between bibliographic entities will be presented transparently and be available to normal users, other NSTL systems and machine/web robots (Martin Malmstern, 2008).

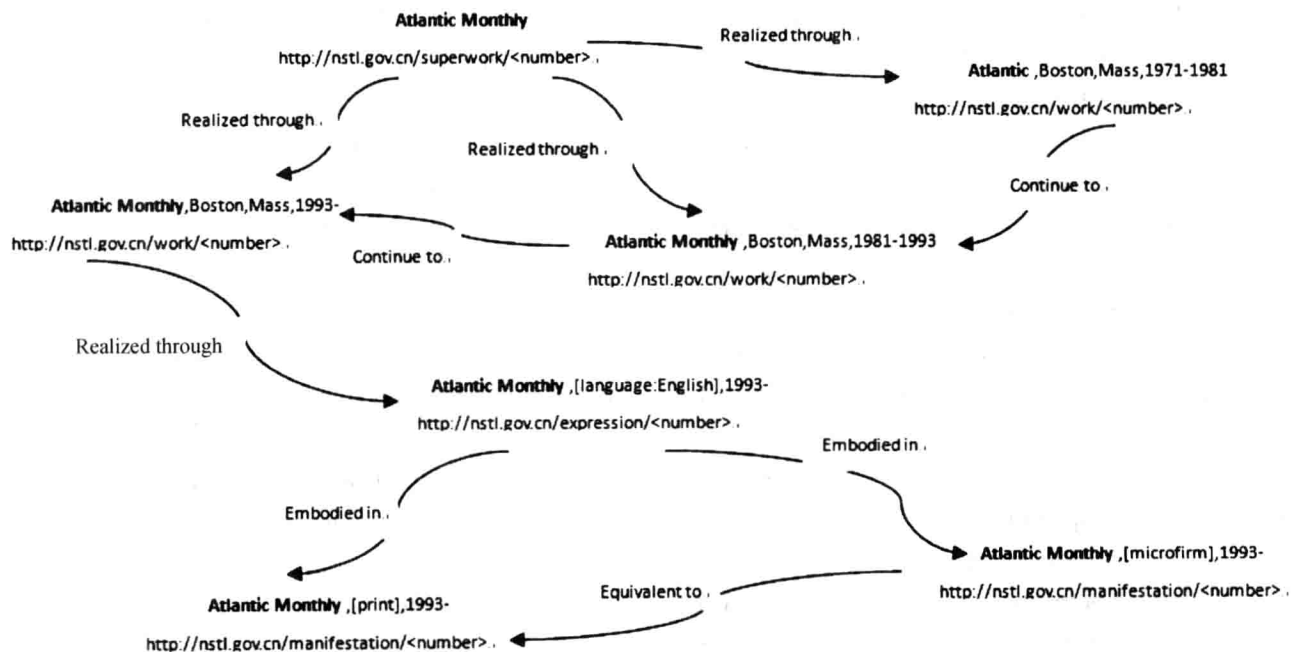


Figure 1 Linking of serial development

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On Government Policy Adoption When Chinese SMEs Improve Competitive Intelligence Ability and Squeeze in Global Software Outsourcing Market

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Abstract: When China's government launches its national level program named "the 1000, and 100, and 10 offshore services outsourcing project", the need that Chinese software SMEs owning matched competitive intelligence (CI) capability when developing overseas market as well as dealing with risk in short term becomes more and more urgent. Besides the effort of SMEs themselves, the China's government should play an indispensable role in issue of improving CI ability. It is obvious that a China's government is able to do many things in this issue, but according to author's opinion, following six strategic measures should be taken in prior position: (1) Give competitive intelligence service a unambiguous law position in policy laws and regulations that promote development of offshore outsourcing software SMEs in China; (2) Launch a special national level program for software SMEs improving CI ability in offshore outsourcing industry of China; (3) Set up a national competitive intelligence system; (4) Provide free public CI product for SMEs; (5) Educate and train CI professionals for SMEs; (6) Promote a CI best practice movement in software SMEs of offshore outsourcing industry.

Keywords: Competitive intelligence; Software outsourcing; Public policy; Strategic measure

1 Introduction

In July 2006, China government announced that a national program named "the 1000, and 100, and 10 project" would launch in next five year^[1]. This initiative means that lots of software SMEs of offshore outsourcing industry in China must face competition from more powerful foreign competitors and face risk more serious than before.

A Canadian research organization points out, competitive intelligence (CI) is a powerful tool for SMEs in getting competitive advantage^[2]. Chinese experts point out, lots of Chinese software SMEs lack of the ability in developing overseas market^[3]. To a certain extent, the essence of lacking of the ability in developing overseas market is that lack of CI ability in overseas

software outsourcing market. For getting competitive advantage in offshore outsourcing business, Chinese software SMEs must depend on active CI works and own powerful CI ability.

Getting powerful CI ability depends on both the effort of corporations themselves and the support from government. Getting support from government is indispensable for SMEs owning CI ability to meet the needs in international competition as well as deal with all kinds of risks successfully in offshore outsourcing software industry, especially in Chinese SMEs business situation.

It is a significant issue to research what should government do for software SMEs of offshore outsourcing industry improving CI ability in China. It is obvious that government is able to many things in this issue, but according to author's opinion, following six kinds

of strategic measures is very important and should the Chinese government do in high priority, these are:

2 Give Competitive Intelligence Service A Unambiguous Law Position in Policy Laws and Regulations that Promote Development of Offshore Outsourcing Software SMEs in China

The first strategic measure that government should be adopted is that give competitive intelligence service a tangible law position, replace the keyword “information service” by “competitive intelligence service” in policy laws and regulations that promote development of offshore outsourcing software SMEs in China, statement distinctly that depends on competitive intelligence service rather than information service to support promote software SMEs of China getting international competitive advantage in offshore outsourcing industry, redesign public information service system for SMEs according to theory and methodology of competitive intelligence subject, and drive all actors of information service field to provide competitive intelligence product and service to offshore outsourcing software SMEs.

Up to now, a series of policy laws and regulations that promote the development of both SMEs and offshore service outsourcing industry including software industry have proclaimed in China. “Law of the People’s Republic of China on the Promotion of Small and Medium – sized Enterprises”, many kinds of practical regulations of fulfilling “the 1000, and 100, and 10 project” national program are major of them.

At the end of 2007, The Department of Small and Medium – Sized Enterprises (SMEs) of the National Development and Reform Commission of China finished a survey that investigates the practical performance after the Law of the People’s Republic of China on the Promotion of Small and Medium – sized Enterprises become effective 5 years. The result of survey reveals that lack of useful information is one of top problems for SMEs to develop their business smoothly even in domestic market, say nothing of in international market,

despite the whole public information service system try doing things well very hard.

An ultimate causation of lack of useful information is that the importance of providing competitive intelligence service to SMEs is neglected in policy laws and regulations. When we give competitive intelligence service a unambiguous law position in policy laws and regulations that promote development of both SMEs and offshore service outsourcing industry, the competitive intelligence ability of software SMEs of Offshore Outsourcing industry of China will improve obviously in short time.

3 Launch a Special National Level Program for Software SMEs Improving Competitive Intelligence Ability in Offshore Outsourcing Industry of China

The second strategic measure that government should be adopted is that launches a special national level program improving CI ability of software SMEs in offshore outsourcing industry of China. This will greatly enhance the CI ability of Chinese software SMEs in development overseas outsourcing market in short time, and achieve “leap – frog” development in target market and selected competitive fields. Just like the model that China enhanced its innovation capacity in the high – tech sectors after launching National High – tech R&D Program (863 Program) .

It is a complex social systemic engineering for software SMEs of offshore sourcing industry in China improving CI ability. In Chinese special business situation, the great effect can always be got by government launching national level special program in this kind of engineering.

When Chinese government launches this program, a national level leader organization will be established. Under the leadership of this top level organization, the leaders of both local government and SMEs will regard the issue of SMEs CI in high priority. Both local government and SMEs will respond to calls from the organization. A national competitive strategy focus-

sing on international software outsourcing market will be formulated. A right orientation, general objective and major tasks will be determined. The issue about improving CI ability of software SMEs of offshore sourcing industry will be put in a high priority, and CI elements and resources from of whole country will be pooled.

To a certain extent, both formulating and implementing competitive strategy is a CI work^[4]. When government formulates its software outsourcing industry competitive strategy, software SMEs as a major stakeholder will be invited to take part in the process, the CI consciousness of the SMEs will be strengthened. When government implements its competitive strategy, what software SMEs own matched CI ability becomes a precondition.

During implementation of this program, a network of organizations including central government, local government, relevant NGOs, SMEs will be shaped, and a special budget will be allocated. The government CI will trigger the SMEs conducting CI work, and will give practical guide and support for the SMEs in CI process. The problems that restrict the development of SMEs CI will be overcome much easier than before.

When launching this program, it is undoubted that software SMEs of offshore sourcing industry in China will improve their competitive intelligence ability in short time drastically.

4 Set up a National Competitive Intelligence System in Offshore Software Outsourcing Industry

The third strategic measure that government should be adopted is that sets up a national competitive intelligence system (CIS) in offshore software outsourcing industry. This will integrate CI elements and resources of whole country into a powerful system, and can provide incomparable decision making support system for whole software offshore outsourcing industry of China, for decision makers of service outsourcing base in 10 cities, and for decision makers of 1000 software outsourcing corporations also.

When setting up the national CIS by central government, a permanent top-level leader organization with responsibility for running it, powerful national competitive strategy step by step, appropriate strategic aim of every year, synergic mechanism among national level CIS, municipal level CIS and corporation level CIS will come into being.

Responding to national level CIS, municipal governments of service outsourcing base in 10 cities will mobilize their administrative and public resources to support the development of their software SMEs. They will provide a better business environment for their software SMEs than before.

Under the guide and leadership of national level CIS and municipal level CIS, each company of 100 software outsourcing corporations will set up its tailored CIS. With the help of national level CIS and municipal level CIS, and depending on the corporation level CIS at the same time, the Chinese software SMEs can present excellent CI ability in following functions:

(1) Monitoring competitive environment in target market, finding out changes in regulation, customers, characters of industry etc., identifying threats and informing early warning timely.

(2) Monitoring the movement of foreign competitors in target market, understanding the competitors better, conducting competitive analysis; outwitting its competitors, outmaneuvering its competitors, and outperforming its competitors.

(3) Supporting decision making in competitive strategy, in winning contracts, in sale and marketing, in R&D, in customer resources management (CRM), in logistics, in cutting cost etc..

(4) Supporting benchmarking, improving performance in each sector of value chain.

(5) Counterintelligence, protecting Intellectual Property and business secrets of both customers and themselves.

5 Provide Free Public Competitive Intelligence Product for SMEs

The fourth strategic measure that government