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KnowledgeLink newsletter October 2008

GLOBAL INNOVATION

Page 2: HIV/AIDS - following the research dollars

INFORMATION PROFESSIONAL DEVELOPMENT

Page 3: Analyzing research performance at Rockefeller University

Page 6: Citation mapping: the one picture that says it all

Page 7: Database content issues in measuring scholarly performance and impact – a lecture tour in Asia

Page 9: One sign-on delivers access to three powerful resources

Page 11: New software by Dr Eugene Garfield provides bibliometric analysis and visualization

INTELLECTUAL PROPERTY

Page 14: The Taiwan model for patenting nanotechnology

Page 20: Building your skills for leveraging patent information

Page 21: Thomson Innovation wins R&D 100 Award

Page 22: Strategic insight into company and technology landscapes

Page 23: Managing external patent agencies

Page 27: Access the world's largest in-house inventory of electronic file histories

PHARMACEUTICAL KNOWLEDGE

Page 28: Ten ways to influence the market

Page 32: The role of Biomarkers in the changing face of healthcare

Page 36: Exploring the 2008 pharmaceutical pipeline

SCIENTIFIC RESEARCH

Page 37: China's science surge rolls on

Page 39: Have your say in the new Citation Impact Center blog

Page 40: Increase the visibility and impact of your research using ResearcherID Labs



HIV/AIDS - Following the research dollars

October 2008

Early in 2008 Thomson Reuters received an inquiry from Science magazine's Jon Cohen, who specializes in covering AIDS/HIV research. In preparation for a feature story on the upcoming annual international conference, he requested a literature review and analysis of AIDS/HIV research during the last decade.

The 25 July 2008 issue of Science followed the HIV/AIDS money trail, reporting on how billions of HIV/AIDS research dollars have been distributed over the past 10 years, and what they have accomplished. Thomson Reuters contributed to this article by supplying insight into 123,752 HIV/AIDS-related papers and their citations.

To meet Cohen's request for a literature review and analysis of AIDS/HIV research during the last decade, we worked closely with him to design an extraction profile that was run against all indexed items for 1998-2007 (publication years). We matched this profile to title words, abstract words, author-supplied keywords and Thomson Reuters keywords plus – retrieving over 123,000 articles. We then loaded the bibliographic and citation count data into xite 7.1. This is a Thomson Reuters software application that enables users to analyze a large group of papers and to produce listings based on output and citation impact in regard to individual authors, institutions, journals, and nations.

Cohen used the database to identify influential authors, institutions, and nations. He matched these results with the author funding. These data helped him obtain a global view of AIDS/HIV research impact over the last decade, supplementing his own intimate knowledge of the field and its key players. The results he generated helped provide a quantitative, objective framework for his report. This is not the first time that Cohen, as well as many other journalists on the science and technology beat, has worked with us to obtain research insight.

In his six month study, Cohen found that the billions of research dollars have been concentrated in a few countries (often for legitimate reasons) but not necessarily in those countries with the worst epidemics. The number of people in need of anti-HIV drugs continues to climb, raising questions about whether resources can keep up with future demands.

Read the full article – with accompanying podcasts and interviews:

<http://www.sciencemag.org/aids2008/>



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Analyzing research performance at Rockefeller University

October 2008

Rockefeller University - a small US university that produces high impact research - uses University Science Indicators to track and measure its research output and impact, pinpoint emerging trends, and make the crucial decisions that determine future directions for the institution.

New York's Rockefeller University is a high-impact research powerhouse. A leading institution in biomedical research, Rockefeller has been the source for myriad scientific breakthroughs, not to mention the home for 23 Nobel Prize winners and 21 Lasker Award winners. Rockefeller's influence and reputation resonate across the globe.

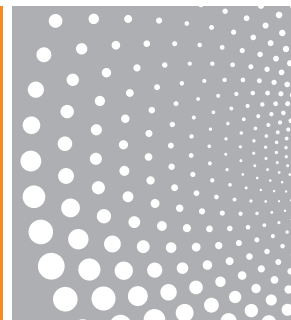
But with this success comes a major challenge — quantifying the reach and impact of its research. The Rockefeller University decision makers turn to Thomson Reuters *University Science Indicators* to help meet this challenge. Covering more than 300 U.S. institutions, *University Science Indicators* enables benchmarking and ranking against peer, as well as target, institutions.

Case study: supporting decision making at Rockefeller University - see next page

ROCKEFELLER UNIVERSITY

NEW YORK, NY, OCTOBER 2, 2007

RESEARCH POWERHOUSE ROCKEFELLER UNIVERSITY LOOKS TO *UNIVERSITY SCIENCE INDICATORS* DATA TO SUPPORT DECISION-MAKING, FUNDRAISING



“...WE HAVE TO BE CLEAR ABOUT WHERE WE WILL FOCUS AND HOW THESE AREAS OF RESEARCH BUILD ON ONE ANOTHER.”

Case Summary:

A small university that produces high impact research, Rockefeller University needed quantitative data to demonstrate its premier position in the global research community. With *University Science Indicators*, Thomson Reuters provided the insights into research performance that allowed Rockefeller University to track and measure research output and impact, pinpoint emerging trends, and make the crucial decisions that determine the directions for the institution's future.

BACKGROUND: AN AWARD-WINNING RESEARCH POWERHOUSE

New York's Rockefeller University is a high-impact research powerhouse. A leading institution in biomedical research, Rockefeller has been the source for myriad scientific breakthroughs, not to mention the home for 23 Nobel Prize winners and 21 Lasker Award winners. Rockefeller's influence and reputation resonate across the globe.

“Our board of trustees must always consider how we are going to develop the campus — which areas are underdeveloped or under-represented, the areas in which we should be looking for new faculty members, and even the kinds of laboratories we need.”

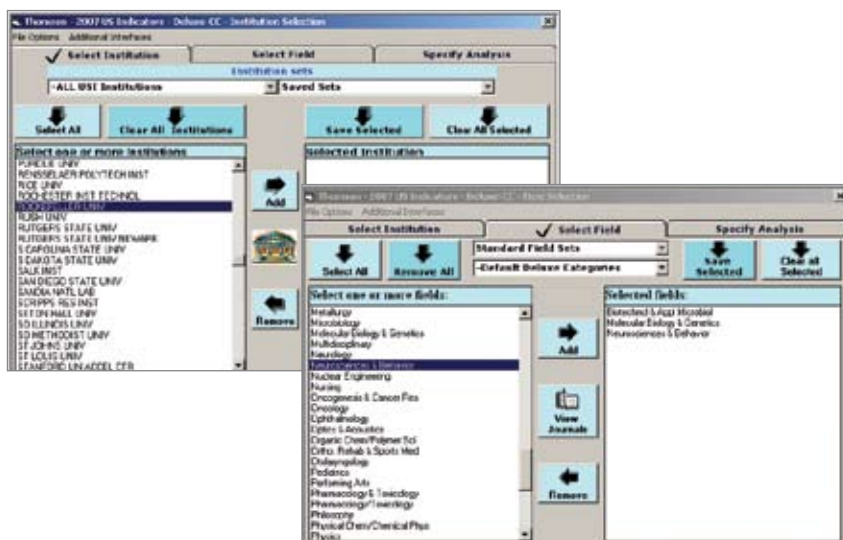
For a quantitative demonstration of the institution's research performance, the Rockefeller University decision makers turn to data from Thomson Reuter's *University Science Indicators*.

BUSINESS ISSUE: MEASURING ACHIEVEMENT AND INFORMING DECISION-MAKING

“We are a small university, but our research is very high impact,” said Carol Feltes, Rockefeller University librarian. “We're known around the world as a place where extraordinary biomedical research is conducted.

But with this success comes a major challenge — quantifying the reach and impact of its research. To maintain the institution's high quality, the university's leadership team needed comprehensive data on research output and influence.

“Our administrators have to make choices,” said Feltes. “Biomedical research is our focus here at Rockefeller, and within that broad field we have to be clear about where we will focus and how these areas of research build on one another.”



An easy-to-use interface for in-depth analysis. Analyze performance by institution, field, output, impact, field baselines, and share.





Trend graph: Institutional impact. See how institutional impact - average cites per paper - can vary over time.



Trend graph: Institutional output. Trends in publication output provide useful insights into an institution's research activity.

THE THOMSON REUTERS SOLUTION

University Science Indicators is an easy-to-use database of research performance measures for universities and research institutions. Covering more than 300 U.S. institutions, *University Science Indicators* enables benchmarking and ranking against peer, as well as target, institutions.

Based on the unique and authoritative publication and citation statistics compiled by Thomson Reuters, *University Science Indicators* contains the number of Thomson Reuters-indexed papers from each university, along with citation counts and other citation impact metrics available nowhere else.

At Rockefeller, using this insight into its research performance has become integral to the decision-making process.

University Science Indicators data inform many administrative and budgetary decisions — from equipment and facilities, to the university's staffing allocations.

Moreover, with the ability to measure research output and impact and identify emerging trends, the institution's leadership can make crucial decisions about the institution's future.

In addition to its use in decision-making, *University Science Indicators* has proved valuable in fund-raising. Rockefeller's data from *University Science Indicators* are an important tool for working with external funders and prospective research partners.

"Anecdotally, we can point to our many Nobel Prize winners and talk about the high quality of our research, but *University Science Indicators* gives us the data to actually show the global reach of our research."

"Our donors help us create new, state-of-the-art labs, because the citation data help them to appreciate our research," said Feltes. "By seeing how the rest of the world uses and needs our research, they are reassured that they are making a good investment with benefits that reach far beyond Rockefeller's halls."

CONCLUSION

Whether they are talking to donors, making decisions about budget and facilities, or wrestling with critical choices about the direction of the institution, Rockefeller University administrators rely on comprehensive quantitative data on research output and impact, thanks to *University Science Indicators*, its Thomson Reuters solution.

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Citation Mapping: The one picture that says it all

October 2008

Finding and understanding the connections between published works can be the key to conducting complete research and tracking emerging trends. Citation mapping helps researchers visualize these citation connections at a glance.

Web of Science users are employing this new tool to visually track an article's past influences (cited references) as well as its subsequent developments (citing references). They can choose to view one or two generations of citations, as well as color code, re-configure, and organize their maps to highlight the citation relationships most important to their research.

Citation maps also let users view the full details on any article – primary, cited or citing – and link directly back to the full record in *Web of Science*.

“...the software itself generates maps, which can be used by librarians in WOS training sessions to illustrate the concept of searching for cited/citing relationships.

People who want a visual impression of the citing-cited relationships to a given document can use the citation mapping feature. Spatially or graphically oriented persons may especially appreciate the map display. Also, to get a sense of second generation relationships, it is easier for anyone to consult the citation map than to consult the times cited and references links.”

Source: “Web of Science’s ‘Citation Mapping’ Tool”
Issues in Science and Technology Leadership

Tutorial: how citation maps can help researchers get the full citation picture

www.brainshark.com/brainshark/vu/view.asp?pi=198303851



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Database content issues in measuring scholarly performance and impact – a lecture tour in Asia

October 2008

Dr. Peter Jacso took his expertise on cited reference searching to Asia in a recent Thomson Reuters lecture tour focusing on the dimensions of the underlying databases and their implications in calculating publishing performance measures of researchers and journals.

Dr. Peter Jacso is Professor, Department of Information and Computer Sciences at the University of Hawaii, USA. During his tour of six Asian cities in July 2008 he was accompanied by Dr. Lim Khee Hiang, Principal Trainer with the Scientific business of Thomson Reuters in Asia Pacific, who gave practical presentations on *Researcher ID*, the global, multi-disciplinary scholarly research community. The lectures were attended by librarians, researchers and academics from tertiary educational institutions in Bangkok, Kuala Lumpur, Singapore, Tainan and Taipei, and by journal editors of the Medical Society in Hong Kong.

Dr. Jacso has received much international recognition for his analyses of database quality, content and software evaluation of scholarly digital archives and other digital reference sources. He has published several books and conference papers, and written more than 500 papers and reviews in research publications such as the Annual Review of Information Science & Technology, Library Trends, Current Science and Cortex, in conference proceedings (National Online Meeting, International Conference on Asian Digital Libraries), as well as in his regular columns and editorials in Online, Online Information Review, Database, Computers in Libraries and Information Today.

Essential database features for measuring scholarly publishing performance

The lecture series explored the practical aspects of using –in addition to the perceptions-based ranking and rating by peers – more objective and reproducible measures for evaluating the scholarly publishing performance of individual scholars, research groups, institutions and even countries based on citation analyses using cited reference enhanced databases. Dr. Jacso demonstrated the essential content characteristics and key features of the citation matching and parsing process in some of the major subject-specific and multidisciplinary databases, that are critical for computing citation-based measures of scholarly productivity and impact.

Traditional and novel measures for evaluating scholarly journals

This segment of the lecture tour for publishers, editors, authors and librarians focused on the traditional and the citation-based novel methods for evaluating readership levels, the feasibility of launching new



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journals, and making journal subscriptions and cancellation decisions . It discussed the performance measures for scholarly publications including the interpretation, reproduction and visualisation of citation relationships, as well as short-term and long-term productivity and impact factors, the h-index and its variants. By analysing, understanding and promoting these measures of performance and influence, editors are better able to evaluate and improve the visibility and clout of their journals, to advise potential authors and subscribers about editorial policies , and to recruit peer reviewers. Knowing and using such indicators also help in collection development and reference services.

The ResearcherID feature of Web of Science

The lecture tour also featured a presentation by Dr. Lim Khee Hiang who has published more than 54 publications in international journals, transactions and proceedings. He introduced *ResearcherID*, which offers researchers access to standardized and clarified author names and citation information in a global, multidisciplinary scholarly research community. This gives users the opportunity to manage public presentation of personal citation metrics and enables the research community the control on how their information is shared with peers around the world.

Additional information:

Visit and register for Researcher ID at researcherid.com

Using bibliometrics: A new white paper focuses on evaluating research performance with citation data:
scientific.thomsonreuters.com/news/newsletter/2008-07/8465001/



One sign-on delivers access to three powerful resources

October 2008

Users of ISI Web of KnowledgeSM, ResearcherID and EndNote[®] Web can now access and personalize these resources using the same email address and password, enabling them to get the most out of their search and analysis efforts.

Registered users of *ISI Web of Knowledge*, *ResearcherID* and *EndNote Web* can take advantage of convenient features that enable them to shape their search to their needs. Depending on which *ISI Web of Knowledge* applications their institution subscribes to, they can:

- select a starting application
- save searches
- set up search history alerts and citation alerts
- create and maintain custom journal lists.

ISI Web of Knowledge access also includes *EndNote Web*, which enables users to integrate searching, writing, and bibliography creation. Once a user is signed-on, this process is facilitated – users can add references to their *EndNote* library directly from *Web of Science[®]* and other product databases; they can use *Cite While You Write[™]* in Microsoft Word to easily cite references in their paper; transfer references to and from the desktop version of *EndNote*, and share references with others who have *EndNote Web*.

Single sign-on also makes it faster and more convenient to register as a *ResearcherID* member. This unique author registry solves the common problem of author misidentification, and makes work more accessible. Once registered, users can go directly to *ResearcherID* from *ISI Web of Knowledge* or *EndNote Web*, without signing on again. *ResearcherID* participants can then manage their publication lists to get the word out about their research accomplishments - raising their visibility when colleagues are searching for citations, collaborators, speakers, editors and reviewers.

If you're already registered with *ISI Web of Knowledge*, then you're also automatically registered with *EndNote Web*. Simply go to myendnoteweb.com to login using the same user name and password.

If you're already registered with *EndNote Web*, then you're already registered with *ISI Web of Knowledge* as well. Simply go to the *ISI Web of Knowledge* homepage and login under "Customize your experience" on the right-hand side of the page.



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Register for ResearcherID using the same email address and password you use for ISI Web of Knowledge. Sign in to *ISI Web of Knowledge* and then click <Sign-up/Access My ResearcherID> along the right-hand side of the page. The information from your *ISI Web of Knowledge* profile will be automatically transferred to the registration form.



New software by Dr Eugene Garfield provides bibliometric analysis and visualization

October 2008

A new software package that helps researchers, librarians, and administrators analyze and visualize bibliographies is now available. HistCite® extends the utility of a bibliography far beyond its use as a reading list, by enabling the user to obtain various views of a topic's structure, history, and key events.

Bibliometric analysis

Bibliometric analysis is the use of the bibliographic information (titles, authors, dates, author addresses, references, etc. that describe published items) to measure and otherwise study various aspects of a specific field of scholarly endeavor. Typical bibliometric questions that can be answered by *HistCite* include:

- How much literature has been published in this field? When and in what countries has it been published? What countries are the major contributors to this field? What are the languages most frequently used by the items published in this field?
- What journals cover the literature of the field? Which are the most important?
- Who are the key authors in this field? What institutions do these authors represent?
- Which articles are the most important?
- How have the various contributors to the field influenced each other?

Historiographs

Information visualization is the transformation of non-numerical data into a graphic format, to help researchers and scholars understand large collections of information. Although there are numerous uses for information visualization, *HistCite* performs one specific application: it converts bibliographies into historiographs.

A historiograph is a time-based network diagram of the papers in a bibliography and their citation relationships to each other. In a historiograph, each paper in the bibliography is represented by a symbol selected by the user. The symbols are arranged over a timeline of the publication dates of the papers and connected by lines that represent the citation relationships. By changing the time frame of the analysis, the resulting historiograph can form a snapshot of a specific period or an in-depth look at the total history of a subject. Once a historiograph is created for a bibliography, it is easier to see and understand the subject's key publication events, their chronology, and their relative influence.



Historiographs can provide an invaluable starting point for those who need to write the history of a subject area - sociologists and science historians can use them to complement the subjective aspects of their work with objective data. The ability of historiographs to quickly and easily aggregate and visualize large amounts of data can help students overcome their initial inertia when starting to write doctoral dissertations. Authors of review articles can use historiographs to quickly pinpoint the key developments in their chosen topic.

Previously, bibliometric analyses and visualization of a bibliography, especially a large one, could only be accomplished (if at all) through onerous, repetitive clerical work. *HistCite* makes it possible for individual researchers to do this work quickly and with minimum help from support staff.

HistCite's origins

Eugene Garfield, Ph.D., president of HistCite Software LLC, is the program's inventor. Garfield is well known as the inventor of Current Contents®, Science Citation Index®, Index Chemicus® and other innovative information retrieval tools. He is also the founder of the Institute for Scientific Information (now part of Thomson Reuters). According to Garfield, he has "always sought to develop tools that increase knowledge and communication by reducing information overload. HistCite continues in this vein." He stresses that *HistCite* "is not just another program for formatting reference lists - it is a powerful analytical tool. In much the same way that a spreadsheet program allows you to better understand financial situations, *HistCite* lets you better understand the structure and history of a scientific or scholarly subject."

Using HistCite

To use *HistCite*, a literature search must first be conducted through Thomson Reuters *Web of Science*. The results are then imported into *HistCite* where the analytical and visualization work takes place under the direction of the user.

HistCite is intended to be useful in a wide variety of professional pursuits:

- **Authors** who wish to write review papers will find *HistCite* helps them gain new insights into the development and current structure of a subject
- **Educators** can use tables and charts created with *HistCite* to better explain a subject to students.
- For **professionals who need to publish**, it can significantly reduce the effort of authorship
- **Authors, publishers, and journal editors** wishing to know the role their publication plays in a given subject area can use *HistCite* for that purpose
- **Science journalists** can gain quick knowledge of a subject upon receiving new assignments
- **Librarians** who do searches for clients can provide added value by applying *HistCite* to their results.



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The bibliography the user feeds to *HistCite* represents the literature of the subject area as it is defined by that user's unique perspective. So the analyses and visualizations produced by *HistCite* from that bibliography are one-of-a-kind, allowing better focus on specific areas than possible before.

Alexander Grimwade, Ph.D., chief operating officer of HistCite Software, claims that "the applications for *HistCite* are limited only by one's imagination. It simplifies the analyses and organization of search output so that researchers will be more willing to construct 'what if' scenarios that can lead to a new understanding of a subject."

Access to HistCite

HistCite sells for USD199 for the base program, with discounts for quantity purchases. Updates are provided free during the first year of use. *HistCite* is delivered via download of a fully functional 30-day free trial package. Try it now at <http://secure.softwarekey.com/solo/products/info.asp?A=68683>. The trial software can be converted to a licensed version via the Web site or by contacting HistCite Software via e-mail or phone. There is a money-back guarantee of satisfaction.

Compatible with most personal computers running Windows, HistCite itself has minimal hardware requirements, but very large data sets will require commensurate hard disk and memory space.



The Taiwan model for patenting nanotechnology

Professor Ruth Taplin

October 2008

Taiwan's government is looking to nanotechnology to make Taiwan more globally competitive. They aim to increase patenting and commercialization of nano products by promoting cooperation between universities, industries and public organizations.

Taiwan is at the forefront of patenting semiconductor and other IT-related products. In 2004 over 40 of their products ranked number one in terms of global market share. These were derived mainly from three local industries: semiconductor, optoelectronic and communication.

Despite the fact that Taiwan's Integrated Circuit (IC) products have strong global sales, a number of their IC technologies lag behind leading global technologies. The Taiwan government is now looking to nanotechnology to make Taiwan globally competitive once more, by increasing patenting and the commercialization of products through a unique model that promotes cooperation between universities, industries and public organizations.

Development of nano-electronic technology

Taiwan firms lag behind the global leaders in Dynamic Random Access Memory (DRAM) and Flash memory. Local DRAM makers depend on Japanese partners for their core technologies, as they do for Magnetoresistive Random Access memory (MRAM) and Ovonic Unified Memory (OUM).

Taiwan's research institutes and industries are attempting to advance their own global competitiveness by focusing on next generation IC memory. They are developing nano electronic technology in three key areas - volatile DRAM, non-volatile MRAM and OUM - as well as CMOS (Complementary Metal-Oxide-Semiconductor) organic electronics.

The Taiwan government plans to spend over USD 1 billion on furthering nano science and technology between 2003 and 2010. This funding will be shared between the basic research supervisor National Science Council (NSC), including the Nano Device Laboratory (NDL) and the Industrial Technology Research Institute (ITRI).

Government control and direction of large scale research projects is unique to Taiwan, where the government even has a say in private financing. In Japan and South Korea such government direction



towards R&D and patenting is now lessening, and being replaced by increased reliance on private company financing or patent pools.

A unique form of government support

ITRI's research funding will be focused on industrialization of technology. The institute is developing nanotechnology platforms to produce high standard results through cooperation between related industries, academics and research centres.

In September 2006, Lux Research, the New York based analyst forecast that Taiwan would become a major player in the nanotechnology field within the next three years. They also ranked Taiwan number one internationally in terms of per capita government funding for nanotechnology during 2004.

The **National Science and Technology Program for Nanoscience and Nanotechnology (NSTPNN)** programme coordinates the research efforts of various government organizations to assist in promoting academic excellence, and to establish common core facilities and educational programmes to facilitate the development of industrial applications. Based on the global competitiveness of the semiconductor, optoelectronic and communications industries, the NSTPNN programme intends to improve academic excellence and develop innovative industrial applications that lead to extensive patenting and commercialization of the products. In establishing internationally competitive nanotechnology platforms, the NSTPNN strives to further advance innovative research to accelerate the commercialization of nanotechnology. The NSTPNN programme is implemented through the promotional cooperation between universities, industries and public organizations.

Public support for nano investment

As nano research and development (R&D) requires significant investment in infrastructure, Taiwan's public sector subsidises and encourages private nano R&D by establishing common core facilities. About one fifth of the funds for nanotech research are distributed in these core facilities.

One major focus of nano science and technology development in Taiwan is the industrialization of innovations. Based on nano R&D infrastructures and research capacities, in addition to the achievements of academia, this sub-program stresses innovative applications by leveraging industry entrepreneurship and linking industry to academia to expand the core competencies of industries. The majority (76 per cent) of the public nano R&D funding has been allocated to this industrialization sub-programme.

The industrialization sub-program that is operated primarily by ITRI launched a '2008 Target' this year that emphasises product differentiation among electronics, materials and chemicals, and among metals and machinery. To achieve these targets, ITRI has dedicated itself to developing 'star' nano technologies



in innovative applications involving IC, display, data storage, photonics, electronic packaging and nano-biomedicine.

Nano-specific patent records

Nano-specific patent records and projections of industrial output can be used to assess the prospects of Taiwan's nano sector. For most International Patent Classification (IPC) categories, Taiwan's nano patents increased during 2000 to 2006. These patents were focused on display and semiconductors at the industry level.

Encouraged by the massive government funding of nanotechnology-related R&D projects, Taiwan's nano sector has recently begun to launch new products, especially for the integrated circuit and optoelectronics industries. A recent Nanotechnology Research Centre (NRC) survey forecast that nanoelectronics and display would be the future 'star' nano industrial sectors. As nano science is cross disciplinary, competitive advantage is being enhanced through product development between IC design firms and mobile telephone manufacturers where R&D requirements overlap, global reputation is boosted and pathways for exports are opened.

The survey mentioned above showed that about 22 countries were represented in foreign applicants of nano patents granted by the Taiwan Intellectual Property Office (TIPO). Domestic applicants including companies, individuals and research institutes are the most active applicants, holding 60 per cent of the granted nano patents. The US and Japan follow at 15 and 14 per cent respectively, with Germany at 5 per cent, South Korea at 2 per cent and others at 4 per cent. ITRI was the leading applicant from Taiwan, accounting for nearly 10 per cent of the granted patents.

A case study of government/private collaborations in Taiwan

The Taiwan Semiconductor Manufacturing Corporation (TSMC) was established in 1987 when it cooperated with Phillips to launch the foundry model in the semiconductor industry, specializing in the manufacture of custom-made wafers under contract to chip designers.

TSMC has performed in an outstanding capacity in promoting the rapid growth of fabless and foundry companies during the past decade. The centre of IC manufacturing has gradually relocated from North America to the Asia Pacific region, where output has surpassed that of any region since 2001. This shift in the IC market has encouraged the development of a fully fledged disintegrative industrial structure in Taiwan. The supply network of Taiwan's IC industry in 2005 included 268 fabless design houses, four mask manufacturers, 13 fabrications, 33 packaging companies and 35 testing houses. Taiwan is also home to material providers of bare wafers, chemical, leadframe and PCB substrate, which are all related to semiconductor manufacture.



Clustering and cooperation are key features of Taiwan’s IC industry. More than 80 per cent of these IC companies are co-located in Hsinchu Science Park, the largest of Taiwan’s three science parks. The interconnected IC cluster in the Park facilitates efficient communication between customers and providers, and the movement of human resources between companies.

Subsequently, the vertical cooperation developed among firms in clusters. These **can encourage greater business/knowledge collaboration**, and promote business linkages and knowledge spillovers that enhance competitiveness in emphasising flexible and rapid responses to the market. Such cooperation can also result in patent pools and sharing resources such as human resources and data bases for commercialization of a product.

As a result of these strategies TSMC ranked 7th and 6th among the top ten global IC companies in 2005 and 2006 respectively with a 20 per cent sales growth.

2005 Rank	2006 Rank	Company (HQ)	2006 Sales (\$M)	06/05 % Change
1	1	Intel (US)	32,268	-9
2	2	Samsung (South Korea)	19,670	10
3	3	TI (US)	13,200	17
5	4	ST (France)	9,854	11
4	5	Toshiba (Japan)	9,782	8
7	6	TSMC (Taiwan)	9,748	19
9	7	Hynix (South Korea)	8,009	43
6	8	Renesas (Japan)	7,900	-4
10	9	Freescall (US)	6,049	8
8	10	NXP (Netherlands)	5,875	4

Source: IC Insights See www.icinsights.com

Figure 1: Top 10 IC companies worldwide

More specifically TSMC has formed a design center alliance with fabless IC design companies in the Hsinchu Science Park, including GOYA and Alchip. Such close connections encourage new firm formation, making Hsinchu Science Park an attractive base for innovation enterprises.



Not only will the innovative activities of Hsinchu Science Park tenants draw benefits from the agglomeration effect of industry clusters, but new enterprises will also be drawn to the Park. Furthermore, the design center alliance of TSMC has been established around the world, and most of the products of Hsinchu Science Park IC design firms have been sold to many major international companies.

Global linkages therefore, mean important sources of technology and markets for HSP foundry and IC design firms. The building of IP highways between neighbouring East Asian countries to the US and UK will enable more effective patent prosecution on a global scale.

Nanotechnology cooperation

Very recently, there has been intensive development of nanotechnology cooperation and alliances among TSMC, the Electronics Research & Service Organization (ERSO) in ITRI, university research centres and global companies.

An example would be a MRAM TSMC/ERSO joint project that initiated in 2002. Recent breakthroughs in nano-scale processing include the '45-nanometer chips' and the 'functional 65nm embedded DRAM device'. TSMC began making smaller, more energy efficient and more powerful 45nm chips in September 2007. Moreover, the 65nm DRAM device offered by TSMC provides higher bandwidth, lower power consumption, and a near 50 per cent reduction in cell and macro size compared to previous high density memory generations. TSMC has made such rapid progress in nanotechnology that it has attracted cooperative opportunities with world leading IDM chip makers such as TI, NXP (formerly Phillips) and Nvidia, a US fabless company.

Taiwan government support, coupled with close cooperation among businesses, and the clustering in the Taiwan Hsinchu Science Park, is making Taiwan highly competitive in the global nanotechnology marketplace - the most rapidly expanding technology of the future. With such close cooperation, patenting in the nano field in Taiwan is accelerating at a rapid rate, alongside commercialization of the products.

I would like to thank Prof. Chyi of National Tsing Hua University for her invaluable assistance in preparing this article.

Additional information:

Patenting trends in Taiwan: scientific.thomsonreuters.com/news/2008-07/8448323

Fast-tracking IP on the Japanese Highway and beyond:

scientific.thomsonreuters.com/news/2008-07/8464984/



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About the author

Prof Ruth Taplin is Director of the Centre for Japanese and East Asian Studies. She received her doctorate from the London School of Economics and is the author/editor of 14 books and over 200 articles. She can be reached at Ruth.Taplin@btinternet.com



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Building your skills for leveraging patent information

October 2008

Technical knowledge is important — it helps enhance your business skills and that helps you leverage information. The AurekaKNOW "how to" series helps deliver this knowledge.

The AurekaKNOW "how to" knowledge series continues on October 23 (please note the new date) with a focus on technical content, Themescape and clustering. Plus, all the sessions have been recorded and can be accessed online at <http://scientific.thomsonreuters.com/forms/aurekaknow>

The AurekaKNOW series will help you learn how to improve queries, use data cleaning techniques with Excel and more. Build pivot tables for enhanced data visualization. Gain insights with "round trip" techniques between Excel and Themescape. Use text clustering and citation trees, and customize your analysis using proprietary fields — be the expert you always wanted to be!



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Thomson Innovation wins R&D 100 Award

October 2008

The R&D 100 Awards, awarded annually by R&D Magazine, recognize the 100 most technologically significant products that have been introduced to the marketplace in the past year. Thomson Innovation, our intellectual property research and analysis platform, has been named a 2008 R&D 100 Award winner.

Thomson InnovationSM was selected as an award winner by an independent judging panel because it is considered an important new product that leapfrogs current technology, according to the editors of *R&D Magazine*. It is an integrated research solution that enables the simultaneous searching of editorially-enhanced patent information, scientific literature, business data and news with analytic, collaboration and alerting tools.

"It is an honor to be recognized as an R&D 100 Award recipient," said David Brown, Executive Vice President, Corporate Markets for the Scientific business of Thomson Reuters. "As the new standard in intellectual property research and analysis, *Thomson Innovation* gives research professionals one place to access the intelligent information they need to make strategic business decisions and more fully capitalize on their IP assets."

More information

R&D 100 Awards www.rdmag.com/awards.html

Visit Thomson Innovation at <http://thomsoninnovation.com>



THOMSON REUTERS

Strategic insight into company and technology landscapes

October 2008

Visual representations and snapshots of patent and scientific information offer quick and actionable insight into company and technology landscapes. A 40 minute WebEx presentation is now available showing how Thomson Data Analyzer can deliver this insight.

Competitive/market intelligence and strategic planning executives throughout the US, Canada and Europe joined Scientific's Ian Pearce for a 40 minute WebEx presentation using Dialog data. The presentation illustrated how a wide range of content such as patent information, scientific literature and news articles can easily be extracted and imported into *Thomson Data Analyzer*. This powerful intelligence tool is compatible with both in-house and commercial databases, and enables you to create cleaned lists, classifications and thesaurus, list comparisons, co-occurrence matrices and maps.

View the presentation at:

<https://thomsonscientific.webex.com/thomsonscientific/lsr.php?AT=pb&SP=MC&rID=40271722&rKey=732262E4F03EF286>

More about Thomson Data Analyzer/Register for a trial: scientific.thomsonreuters.com/products/tda/



Managing external patent agencies

Donal O'Connell, Nokia

September 2008

The management of external patent agencies is, in many ways, very similar to the management of in-house resource. It is all about fact-based management and values-based leadership. This article takes a closer look at this management task, written from the perspective of a company or organization involved in patent creation activities. The content is drawn from Donal O'Connell's book 'Inside the Patent Factory'

The successful management and leadership of a patent-producing organization (patent factory) involves providing clear direction and meaningful vision to all parts of an organization, and deploying and then controlling resources, be that people, money, physical and intangible assets. 'Inside the Patent Factory' provides advice about how best to arrange the human resources available to optimize the effectiveness and efficiency of the organization. It then looks at which tasks are best conducted internally (as opposed to outsourcing) and which organization structures and formats work best to meet the challenges of setting up a successful patent factory.

Who are the external patent agencies and what services do they provide?

When we examine the various ways in which patent creation activities may be organized by a company or organization, there are many models that involve doing some of the work outside. In fact, a few of the models suggest outsourcing all, or almost all, of the activities.

There are indeed intellectual property or patent-specific companies capable of handling some or all of the tasks on your behalf. Their capabilities range from analysis of the novelty and patentability of an idea through to actual drafting of cases, filing the appropriate paperwork with the Patent Offices, prosecution of cases, including handling office actions and taking care of translation work. Also included would be filing foreign cases with the appropriate Patent Offices, conducting detailed searches and examinations, and all tasks right up until the grant stage. There are also external companies who will manage the payment of annuity fees on your behalf.

Why subcontract?

Involving an external patent agency into your patent creation operation basically means buying certain work results from third parties. Subcontract work is normally based on your specifications and requirements but you, the customer, and the external patent agency may also compile specifications together. This is a better approach as it enables the external patent agency to contribute based on their skills, competencies and knowledge.

There are many reasons to subcontract work to an external patent agency. Outsourcing may increase your flexibility in terms of resourcing, leading to faster response times and wider overall opportunities when your competence and capacity pool is expanded. You may wish to focus your limited resources on what you consider to be core activities, critical cases or key competence areas.

What work can be subcontracted?

Some or all of the tasks of a typical patent creation factory can be subcontracted to external patent agencies. The capabilities and duties of the external agent will range from analysis of the invention idea for novelty and patentability through to actual drafting of cases. This can include filing paperwork with the Patent Offices, prosecution of cases, handling office actions, translation work, filing foreign cases with the appropriate Patent Offices and conducting detailed searches and examinations. All these tasks fall under the umbrella of 'Patent Creation' right up until the grant stage. Once you have your granted patents, there are also external companies who will manage the payment of annuity fees on your behalf.

Challenges in sub-contracting

Subcontracting to an external company is not always easy. There are a number of potential challenges to take into consideration, so the contract between you and the external patent agency is of paramount importance. Even if there is an agreement already in place it may be out of date, poorly written or not comprehensive enough to meet your needs. You must also ensure that your practices and those of the External Patent Agency are in line with the agreement.

A common understanding on pricing is critical and should be defined in detail. You also need to consider the additional costs relating to the management of external patent agencies, as this is often ignored.

The long term goal is to have an optimized number of carefully selected external patent agencies that are managed in a unified way, and with whom the relationship is constantly developing. The workflow between you and the external patent agencies also needs management, and cost and quality controls need to be put in place.

Key principles regarding agreements with external patent agencies

Written agreements will help clarify the division of responsibilities with the agency, and also serve as a risk management tool. Such formal agreements may govern the entire relationship or be case-specific. The choice is probably influenced by the volume of work involved, including whether the assignments will be regular or irregular, the criticality of the external patent agency in terms of their geographical location, and their technical capabilities or capacity.



The agreement content should be fairly generic and adaptable to work for many companies and organizations with ease. For many external patent agencies the most problematic sections of the agreement tend to be with quality requirements, remedies and liabilities/indemnification

Example of a pricing model for external patent agency work

It is worthwhile to give some consideration to establishing some key pricing principles when you are outsourcing work to external patent agencies. Do you wish to keep your pricing structure as simple as possible and to have a similar pricing model that will apply across all your external patent agencies? It would be most useful if your actual costs followed your budget for each phase of the patenting process.

Managing the external patent agencies

Having formal agreements and pricing models in place with your external agencies is really only setting the foundations of your working relationship. Much more is needed to truly manage and build long term mutually beneficial professional working relationships.

You will need to gain a good understanding of both the intellectual property and technical skills and competencies of the external patent agencies, and especially of those individuals who are actually handling your cases.

Capacity planning is another important element in the management of your external agencies. You need to know how much work the agency is willing and able to do for you in the foreseeable future, and most importantly if there are any resource issues on the horizon.

To help ensure consistency across your patent portfolio it is worthwhile creating a requirement specification or quality guidelines document for use by all of the Patent Agents and Attorneys who will be drafting, filing and prosecuting patents on your behalf. This will help provide some level of consistency in the drafting, filing and prosecution of your cases.

Regular auditing of your external patent agencies should form part of your management program. Respectful but direct feedback on non-performance is important and this example should be set very early in the relationship. If commitments are not being met by your Agents, then you must call on them immediately, as this will set the rules and expectations immediately.

What is expected from you?

The responsibility for ensuring a good professional working relationship with an external agency does not rest alone with them. There are also responsibilities for you, the customer, which include management and development of the relationship. If your relationship is likely to be big volume it is recommended that



you nominate a relationship manager to, amongst other responsibilities, ensure the invoicing system and payment process is working efficiently.

Associations for external patent agencies

External patent agency societies, associations and bodies exist to regulate the conduct of their members. For example in the UK the Chartered Institute of Patent Attorneys (CIPA) is the professional and examining body for Patent Attorneys (also known as Patent Agents). In the USA, there is AIPLA, the American Intellectual Property Law Association. There is also an association in China called the All China Patent Agents Association or ACPAA.

All members of such societies, associations or bodies must agree to abide by their rules of professional conduct. These are written to ensure that clients will receive accurate and impartial advice that puts the interests of the client foremost.

Outsourcing the management of the payment of Annuity Fees

Once the patent has been granted, there are still annuity fees to be paid in order to keep the patent alive. You must weigh up whether the decision to use an external company, for example Thomson IP Management Services, for the management and payment of such fees will make sense for your company.

What can go wrong?

With any external suppliers, generally things can go wrong when you are unsure what you actually want to purchase. You must be clear on what you expect of your external patent agency, what the work results should be, and how they should communicate with you. Simply setting up agreements and a pricing structure is not enough, and in the case of fault or non-performance you must utilize the remedies and sanctions provided in the agreement.

Summary

The decision on whether to allocate tasks internally or externally is a difficult one. There is no 'right' way, and the right decision varies between companies and situations, as there are many factors to take into consideration. This can be compared to a pendulum swinging from internal to external and back again and never quite remaining at either end.

Almost every single activity can be treated as a commodity, meaning that you can obtain quotations for any activity you are intending to outsource.

About the author

Donal O'Connell is Director of IPR, Nokia. His book, "Inside the Patent Factory" was published by Wiley & Sons in April 2008.



THOMSON REUTERS

Access the world's largest in-house inventory of electronic file histories

October 2008

The new Thomson File Histories Web site is now live at thomsonfilehistories.com, giving immediate access to over 200,000 electronic file histories.

Quick and easy access to file histories can be critical to the success of intellectual property litigation, research and development and patent and trademark prosecution. You can count on us to deliver fast, accurate results in the format that best meets your needs.

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- Search Services

10 ways... to influence the market

**A practical guide by Lawrence Liberti and
Patrick Dennin**

The role of every brand manager, regardless of industry, is to ensure their company's voice is heard over the background noise of the marketplace. Unlike other industries,

however, guaranteeing a positive reception for a new pharmaceutical product isn't just a case of spending the most on advertising or sponsorship. There are

strategies you must adopt in order to influence the market positively and make sure you realise the greatest possible return on your investment.

1. DETERMINE WHO IS YOUR ACTUAL CUSTOMER

Throughout the research and development phase, your team had a clear audience in mind - the patients who will hopefully benefit from your endeavours and innovation. The impetus was to create a better drug that will improve treatment and quality of life.

But suddenly, when the drug reaches commercialisation, the customer changes. Except to a very small degree, the marketing team doesn't sell to the patient. Neither is the clinician the primary customer, since they don't make the final decision when it comes to prescribing your drug. Undoubtedly they have an influence, but your primary customer is that large and diverse group including third-party payers, regulatory bodies and patient advocacy groups. It is these people who will fund your drug, and it is these people you must convince in your marketing.

Therefore, it makes sense to engage with the marketing department throughout research and development to ensure you have a coherent, compelling story of distinct therapeutic benefits that will convince payers and regulatory bodies, not just patients. Indeed, it may be better to think of a drug as providing 'value in use' rather than therapeutic advantage.

Rather than leave the decisions about which drugs to pursue entirely to the researchers, your organisation should share the decision between research, portfolio management, franchise strategy and marketing teams. This means that effectively marketing has two distinct functions: to push information outwards, and to be the voice of the true customer within the organisation.

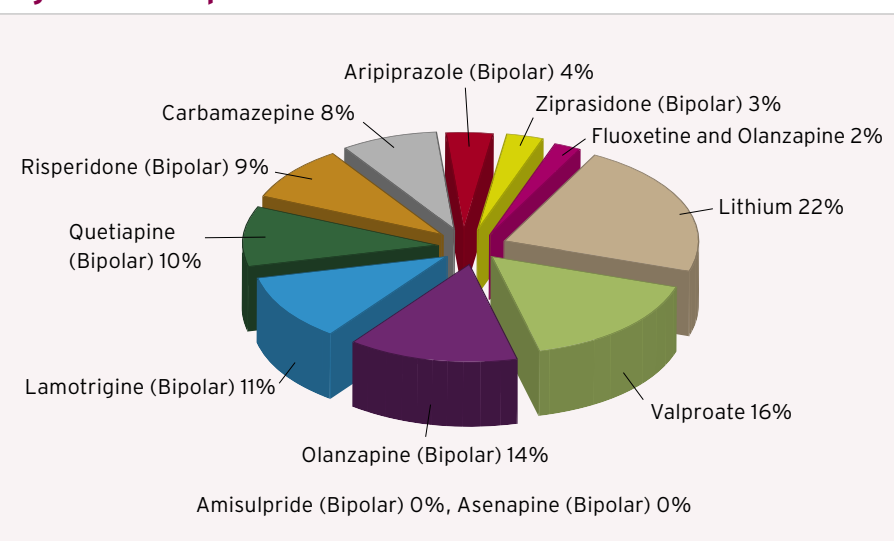
2. EDUCATE THE PATIENT

Clearly, the influence of each of the target audiences is in flux. Originally you only needed to convince the physicians. Today, as we have seen, it is the third-party payers and regulatory bodies who are your primary customers. But the role of the patient is changing, too. Arguably, we are witnessing a shift back toward the patient as, if not a primary customer, but a significant influence on prescribing patterns.

There's always been a 'hassle factor' in the clinics - patients having seen an advertising campaign, or read a news article and demanding the drug for their own treatment. This can put them into conflict with their doctor or payer, but except in a few high profile cases will not generally change the clinician's prescribing habits or influence the payer.

However, the increasingly diverse

Figure 1: SOV for product



marketplace is putting more perceived power into the hands of the patient. New channels of information, such as the Internet and direct-to-consumer advertising, bring expectations of receiving gold standard treatment. Patients are more literate, educated by better news reporting, ever more available information, and fuelled by patient self-help or knowledge-sharing groups. The 'hassle factor' can work, and your marketing strategy can only benefit by exploring these channels: better informing the patient so that they will act as your advocate in the clinic, and to some degree become your voice in the community.

3. EXPLORE THE AVAILABLE CHANNELS OF INFORMATION

An intelligent marketing campaign, then, should embrace all the available channels, not just the traditional scientific platforms. The patient group that finds information on your product website, in order to support their demands for gold standard treatment, can be a powerful voice. So can the doctors who network online to share case studies and best clinical practice, and to alert each other to new therapies.

Through the Internet, patients and doctors alike are sharing knowledge not only about the benefits of new drugs, but about adverse effects, too. 'Blogs' give their contributors complete, generally uncensored access to the experiences and opinions of their peers - experiences and opinions which, for good or bad, can have a huge influence on the market. You cannot affect these pools of shared information, but you need to build your marketing strategy intelligently to take account of them.

Effectively, you are able to exploit the same methods of 'viral marketing' that other industries use to great effect. It doesn't matter if you're selling drugs or

washing powder: you can effect great change by building up that information buzz throughout the target community.

4. FIND NEW FORUMS FOR YOUR MESSAGE

As an example, podcasting is capable of reaching a huge audience. The portable media player is now ubiquitous. It's certain almost all your patients will own one, let alone the physicians and academics and influencers throughout the hierarchy of your target audiences, and uptake of ever more sophisticated and bandwidth-hungry content is growing exponentially.

What's more, the podcast has an image that is exactly right for the innovative, forward-thinking, 'new frontiers' role that pharmaceutical companies like to build for themselves. New media is associated with the cutting edge of science and technology, a forum for building 'cool' brands. Just by the fact of you using it, this type of delivery will reinforce the image your organisation wants to portray - immediate connection with your audience from a company on the crest of innovation.

Already, we're seeing pharmaceutical institutions embracing channels like these. The European Respiratory Society and the American Society of Clinical Oncology were among the first to offer podcasts of their congresses. Virtual sessions were online a week after the event, feeding the vast audience of clinicians and other influencers too busy to attend. The scope for sponsorship is huge, let alone the forum for press releases, clinical trial results and marketing messages.

5. THINK LIKE A CLINICIAN

When it comes to influencing the clinician, your main problem isn't that this audience lacks information about your product. On the

contrary, they have too much information to deal with. Your voice may well be drowned out not just by the voices of your competitors, but by independent research, comparative studies, and the roar of scientific and market information directed at this sector.

For you, this is a problem. But for the clinician, it's worse still. Somehow they are expected to make intelligent prescribing decisions despite not having the time, tools or resources to turn that barrage of information into actionable knowledge.

Thinking like a clinician means understanding the methods by which clinicians filter out the background noise to isolate the data or message they can trust to steer their prescribing habits. You may not be able to shout above the noise, but you can certainly apply objective, scientific methods to understand how your messages are being received.

Clinicians turn to scientific journal articles and medical meeting content to analyse and assess the strengths and weaknesses of therapeutic options. They then use this learning to reach clinically-supported conclusions about the risk/benefit profile of each therapy. Clinically-supported decisions are what all good clinicians strive to practice. Knowing how positive and negative messaging affect the weight of evidence that they use to judge a therapy, you can emulate their processes and position your products accordingly.

6. LEVERAGE MESSAGE MAPPING TO YOUR ADVANTAGE

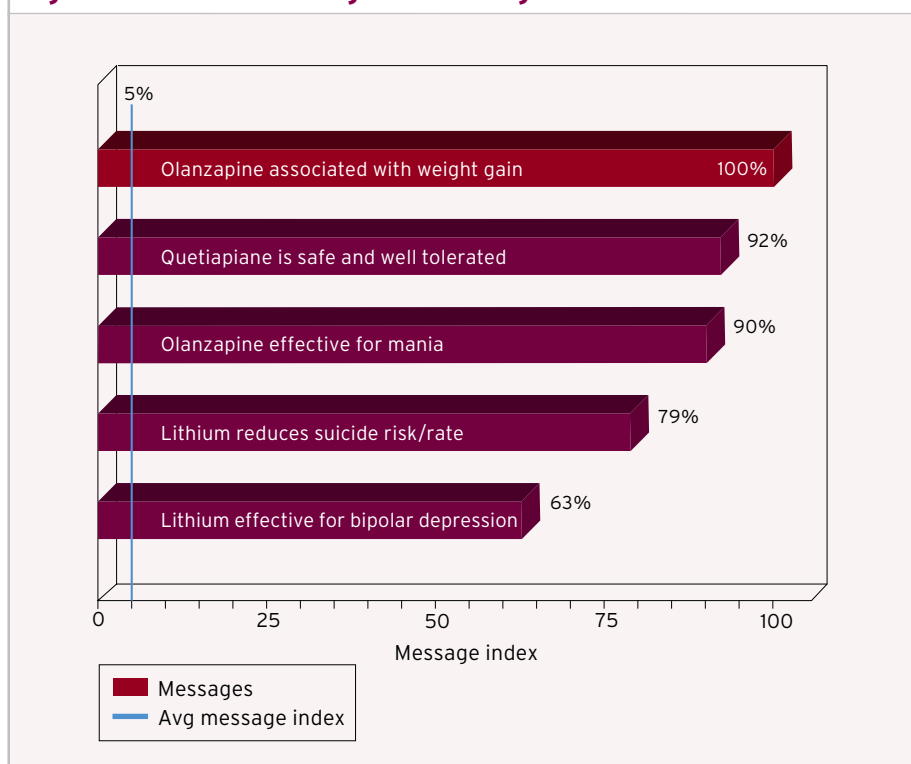
'Message mapping' is the term used to describe attempts to analyse the information that clinicians are exposed to, in order to evaluate critically the characteristics of its key clinical concepts and themes. By developing a systematic means of identifying key resources, messaging mapping can identify the publications most likely to shape professional opinions about particular drugs and therapies.

One way to visualise the extent to which positive or negative information influences a clinician's opinion of a particular therapy is to aggregate a 'product credibility index' value for this information. You may find that for some therapies the extent of negative information is almost as large as the positive aspects of the drug.

A 'share of voice' analysis (Figure 1) can show the extent to which there is a discourse in the literature about a particular drug and even in which uses there is more interest.

Understanding how competitors have developed their drugs will give the clinical department an edge in designing their clinical studies to best characterise the

Figure 2: Normalised messages with the highest index



new drug. Through message mapping, your organisation can see analyses of the indications being investigated by its competitors, and can identify respected investigators to help design and implement the clinical program.

7. BUILD UP A PROFILE OF YOUR DRUG

Message mapping can also help to plan your marketing strategy. It can help to develop a profile of the strengths and weaknesses, from the clinician's point of view, not only of your new drug, but also of its competitors.

Identifying the strengths, weaknesses, opportunities and threats (SWOT) of a drug is a key aspect of developing a profile of knowledge about it. Categorising strengths and weaknesses about target drugs as described in the scientific literature can provide a unique way to profile a product.

Individual key concepts or messages influence our understanding of the benefits and weaknesses of particular therapies. A 'message credibility index' (Figure 2) can assess key messages, ranking them for their strength and frequency. By aggregating the messages (positive and negative) for a product, you can calculate a 'product credibility index'. By plotting the change in product credibility over time (Figure 3) you'll learn about trends that can occur based on information in the published literature.

8. PREPARE THE MARKET

Every pharmaceutical company primes the market for its drug from the moment

it releases the first information about that drug. Long before the product reaches the shelves, you need to have a market that is ready to receive it, and eager to begin prescription.

To achieve this, your strategy should not just rely on clinical results and scientific data. You need to employ the market influence of objective, independent scientists and clinicians. The more credible and respected the advocate, the more impact your early messages will have.

In other words, your early strategy needs to expand away merely from brand management to embrace medical affairs and medical science liaison functions within your organisation, generating clinical data and laying the groundwork for your product in terms of customer education. In not so many words, the internal functions and external advocates act as front-line training teams, not just building awareness of your product but 'visualising' it into the day-to-day working practices of healthcare practitioners.

9. DEVELOP KEY OPINION LEADERS

Every company is different in the way it identifies and engages with thought leaders. The methods you use should cover the entire spectrum of available advocates, from academics and scientific experts to clinical investigators and the clinicians themselves. Among opinion leaders, the advocates to target are not necessarily those who speak and read most - being prolific is not necessarily a measure of whether they're

being heard. To determine this, you need to analyse carefully the citations that show that a person actually has influence on the therapy area in question.

Exactly as with message mapping, you can apply objective, scientific measurement to opinion leaders, ranking them precisely in terms of their influence and voice. How prestigious was the paper? How much impact did they have? How much did they contribute? At the same time, careful analysis of these publications and sources can show when an opinion leader is also being paid by one of your competitors, ensuring you don't approach them.

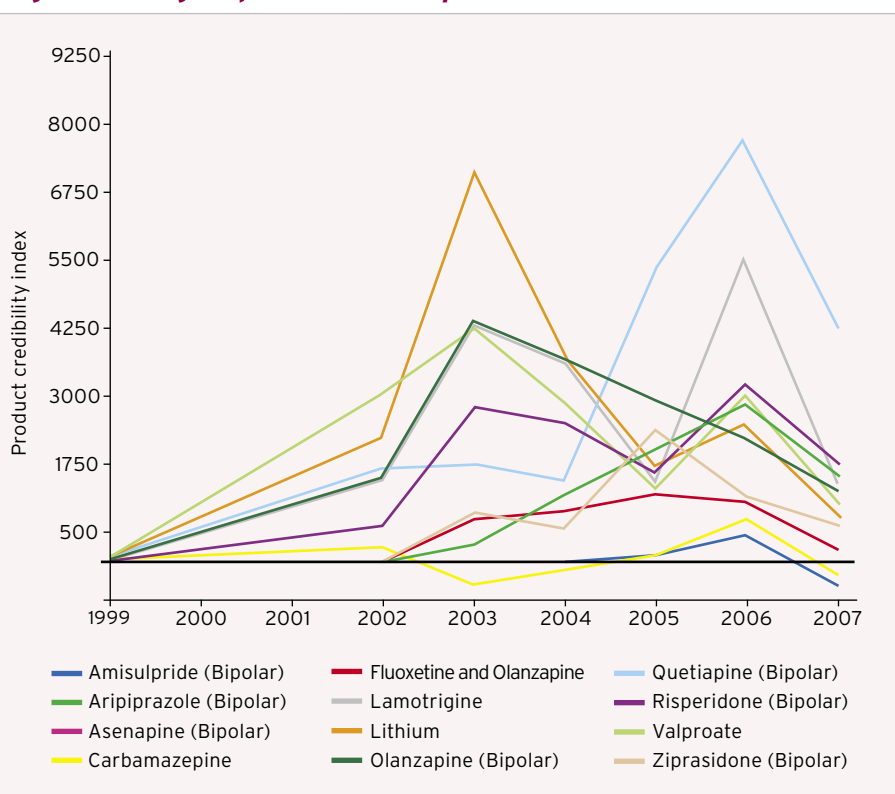
An 'advocate mapping' system should also enable you to apply weightings to the list of available opinion leaders, so that you can choose the advocate right for your organization based on their H-index and the publications (first author, last author), patents (first inventor, last inventor), or clinical trials (principal investigator) they're linked to, not just the overall number of citations. The result is a 'scorecard' system that gives you the best fit advocates at a glance.

10. REALISE THAT CLINICIANS ARE ALSO ADVOCATES

Doctors influence doctors. This means that even on the front-line of patient care, there are unpaid, unrecognised potential advocates for your drug. Your organisation needs to gauge not just how a clinician influences their peers, but how likely an individual clinician is to be influenced by changes in healthcare policy. For example, if a hospital or private care trust adopts a negative stance on a drug, or swaps to another, what is the likelihood that a clinician will cease prescribing it?

Clearly, if a clinician is not easily influenced by such a swing in hospital policy, he's of great value to your organisation. Such strong-minded individuals are most likely

Figure 3: Change in product credibility over time



to be important influencers and to provide stability in the sale of future products. They don't wait for their peers to adopt a new drug before following suit. They do their own research, make their own decisions, are likely to be early adopters - and most of all, are likely to influence those around them.

Indeed, these clinicians can be among your strongest supporters in the marketplace, and should be part of an intelligent marketing strategy. Instead of building up segmentation data based on prescribing volume, it makes more sense to build a profile that includes the clinician's zest for scientific data, desire to know more about added values such as patient support, and the kinds of commissions and panels they sit on, to ensure that the right kinds of

product messages are directed their way. When your representative visits this kind of clinician, they need to keep in mind that they're not trying to sell a product. They're nurturing and developing a brand advocate and, through them, influencing the entire market.

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THOMSON MESSAGE MAPPING SYSTEMSM

Measures the potential impact of published scientific information on the clinical practices of healthcare professionals by ranking it in a way that reflects their selection and reading processes.

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The role of Biomarkers in the changing face of healthcare

October 2008

Biomarkers are a beacon of hope in the current tumultuous pharmaceutical industry climate. They have the potential to encourage innovation, improve efficiency, save costs, and gain research organizations a valuable advantage over their competitors. However research organizations face a number of hurdles in realizing and passing on these benefits.

The pharmaceutical industry is facing significant challenges, in 2006 only 22 new molecular entities (NMEs) were approved for use by the US Food and Drug Administration (FDA), down from 53 in 1996. Of greater concern is the fact that R&D spend by US companies in Pharma research has increased from USD 17m to USD 43m alongside this decrease in productivity (Ref 1). In conjunction with this there have been some high profile drug withdrawals due to safety concerns, for example Vioxx.

These factors, along with increased generic competition and patent expiration have contributed to the increased cost of developing a drug. The major stakeholders – the patients, payors, pharmaceutical industry, clinicians and regulatory agencies are all facing a period of change as they seek to address these challenges. How their reactions play out over the next few years could well set the course of drug discovery for years to come. In this article we will select one beacon of hope in the current tumultuous climate, looking at how the pharmaceutical industry is using Biomarkers in an attempt to begin to address these issues.

The potential impact of Biomarkers

There seems little doubt that Biomarkers will be one of the major drivers of pharmaceutical research and drug development in the 21st Century. Biomarkers have the potential to encourage innovation, improve efficiency, save costs, and gain research organizations a valuable advantage over their competitors. However, at the present time research organizations face a number of hurdles in realizing and passing on these benefits. Regulatory agencies are reluctant to accept biomarker-based evidence to support a drug approval without reliable standards of biomarker documentation. The information provided by a biomarker must be absolutely trustworthy if it is to be used to support a key decision. And biomarkers must become established enough that they shift the research paradigm away from the 'blockbuster' model to smaller-market but more carefully targeted products.

At the recent Pharmavision meetings hosted by Thomson Reuters, Dr. Jeffrey Ross, Albany Medical College, a renowned researcher in Oncology presented his view on Biomarkers (see

<http://scientific.thomsonreuters.com/biomarkercenter>)

The regulatory authorities

The bodies who regulate the approval of new drugs are looking across the whole of drug R&D for how to address these issues. The FDA released their first Critical Path Initiative in 2004 and has continued to expand and refine its initial premise. The basic idea is to reduce uncertainty about a product's performance throughout the product life cycle through scientific research. There are all-round benefits with this approach

- to the patient through increased efficacy and improved safety
- the payors through cost effective therapies
- the pharmaceutical industry through increased return on investment.

One of the key opportunities identified by the FDA is a greater use of Biomarkers throughout the drug R&D process.

The role of Biomarkers in the drug development process

Biomarkers can provide their discoverers with tangible benefits by speeding up and focusing the development of associated treatments for the disease they indicate. Therefore most biomarker research is proprietary, and biomarkers are themselves commodities just like the drugs they help to bring to market. Biomarker research, too, follows a similar pipeline to drug research: from discovery, through initial documentation, exploratory use in pre-clinical and clinical development, to publication and regulatory approval, and ideally onward into widespread adoption in the clinics. There is undoubtedly as high an attrition rate in biomarker development as in drug development. The end point for a biomarker researcher may not simply be to support drug development, but to establish and manufacture diagnosis kits and software, with all the licensing opportunities that suggests.

Hurdles in Biomarker research

As with all emerging fields of research, identifying the useful information and then applying it to the benefit of your research can be a challenge. Biomarkers are no exception here.:

What is the best Biomarker to use for my research?

How does it differ if I want to diagnose a disease or select a patient cohort for treatment?

How can I measure it effectively?

These are just some of the questions asked by researchers who are employing biomarkers. It doesn't stop there, the needs of the discovery scientist differ from those of the clinical scientist. The transition of a biomarker from discovery and development into a clinical setting is a real bottleneck, the use of



translational research can help to minimize this but until clinical and discovery groups have complete alignment, Biomarker selection will continue to be a challenge.

One of the issues here is finding the information, Biomarker information is exploding at a huge rate, and it can be found in academic literature, patents, clinical trial documents and websites, press releases and presented at congresses. For a researcher wanting to use a Biomarker in their research, the challenge in finding the information they need can be daunting. Their task is made even more difficult by the non-standardized terminology applied in Biology, particularly Gene and Protein synonyms. Because of this it is difficult to ensure comprehensive searching. Searching patent documents and congress information can prove difficult. While it may not be difficult to find information on well-researched Biomarkers, such as Her2, it can be difficult to be sure you have identified all the uses for the Biomarker. It can be almost impossible to find those new, emerging Biomarkers without significant resource investment

BIOMARKERcenter

At Thomson Reuters, with our history of creating high quality, comprehensive value added scientific databases, we feel we are suited to helping Biomarker researchers and have created *BIOMARKERcenter*. Using a unique lifecycle approach to indicate the stage of a given biomarker, *BIOMARKERcenter* covers individual biomarker usage as identified in literature, patents, conferences, clinical trial information, and other sources for all major therapeutic areas.

For each therapy area, *BIOMARKERcenter* includes not only biomarkers with established clinical usage, but also emerging uses for the biomarker. Each record is manually created and expertly indexed to enable searching by fields such as name, type, biological process, indication, population, role, measurement technique, substrate, lifecycle stage, and development status of diagnostic kits. Each record is further enriched with links to all supporting source documents, throughout the history of the biomarker

The future

It seems likely that Biomarkers will continue to play an increasingly important role in improving the effectiveness of drug R&D. This, coupled with the rapidly progressing understanding of the molecular basis of disease processes, would seem to hold the greatest promise in addressing the challenges found in drug R&D. We are seeing the emergence of Personalized Medicine, and the opportunities are tantalizing. It seems the pieces of the jigsaw are beginning to appear: decreased costs of high volume genomic sequencing, development and marketing of consumer diagnostic tests, improved pre-therapy screening of patients. How far away the real era of personalized medicine is will depend on the appetite of the pharmaceutical industry



THOMSON REUTERS

A number of organizations are already benefiting from the data found in *BIOMARKERcenter*, including the National Cancer Institute. (http://thomsonreuters.com/content/press_room/sci/27598911)

Learn more about *BIOMARKERcenter* at

http://www.thomsonreuters.com/products_services/scientific1/biomarkercenter

Ref1: US FDA, "CDER approval times for priority and standard NMEs and new BLAs Calendar Years 1993-2006", January 29, 2007.



Exploring the 2008 pharmaceutical pipeline

October 2008

Three newly published Pharma Matters reports use market intelligence and competitive analysis to explore various aspects of the 2008 pharmaceutical pipeline.

The Ones to Watch – Our latest quarterly review of the phase changes in the pharmaceutical pipeline reveals the top five most promising drugs launched or receiving approval in quarter one 2008. These include Tibotec's Intelence™, targeted at HIV-1 infection, and lonsys™, being developed by ALZA for acute pain.

Movers and Shakers – This quarterly report analyses the U.S. generics industry. In quarter one 2008 this analysis uncovered observations that

- The U.S. generics market is remarkably robust but will be hit by the current downturn in drugs innovation, which will translate into a decline in off-patent drugs from 2012
- 'Super Generic' companies such as Teva and Mylan now dominate the generics market and will be the best placed to survive any future downturns
- Final approvals were issued on 134 'A'-rated ANDAs, up from 108 the quarter before

Who is Making the Biggest Splash? – This report reviews scientific literature on drugs and therapies, assessing the quantity and quality of the materials published by pharmaceutical companies, research institutions and other non-commercial bodies. The five organizations with the biggest impact from January to March 2008 were Eli Lilly, sanofi-aventis, Novartis, Bristol-Myers Squibb and GlaxoSmithKline.

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THOMSON REUTERS

China's science surge rolls on

Christopher King

October 2008

China has dramatically increased its output of scientific papers, while also seeing the citation impact of those papers steadily rise. The latest Science Watch analysis shows a nation rapidly securing prominence in world science.

When *Science Watch* last surveyed China research in 2004, the nation's annual output of Thomson Reuters-indexed papers still fell shy of Japan's 2003 total of 75,000+ papers. However China's rising trajectory in output intersected that of Japan in 2006 and soared past in 2007. In fact, among all nations, China ranked #2 by number of papers published during 2007, second only to the United States.

See the full Science Watch analysis at <http://sciencewatch.com/ana/fea/08julaugFea/>

Additional information

Australian Universities Ranked Among The Top 50 Most Cited Research Institutions In The World

Sydney, AUSTRALIA, September 3, 2008

Universities in Australia are ranked amongst the world's top 50 most frequently cited research institutions over a period of five years from January 2003 to December 2007

<http://scientific.thomsonreuters.com/scientific/press/2008/8472598/>

Thomson Reuters And The Chinese Academy Of Science Research Front Analysis Center Jointly Honour China's Contribution

Beijing , CHINA, May 28, 2008

China's scientific papers and their authors were recognized today with the first 'Thomson Reuters Research Fronts Award 2008' jointly presented by the Scientific business of Thomson Reuters and the Chinese Academy of Science (CAS) Research Front Analysis Center.

<http://scientific.thomsonreuters.com/scientific/press/2008/8455938/>

Taiwan Universities Ranked Among Top 1%

Taipei, TAIWAN, April 28, 2008

Universities in Taiwan are ranked amongst the top one percent of research institutions from around the world over a period of five years from January 2003 to December 2007. According to data derived from the 'Essential Science Indicators SM (ESI) database of the Scientific business of Thomson Reuters, at least



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one Taiwan institution is ranked among the world's top 100 in five of 22 categories, namely Agricultural Science, Chemistry, Engineering, Materials Science, and Pharmacology & Toxicology. Engineering and Materials Science were two fields in which more than one Taiwan university was represented within the top 100

<http://scientific.thomsonreuters.com/scientific/press/2008/8450553/>

Thomson Scientific Announces Ranking of Top 20 Japanese Research Institutions for All Fields

Philadelphia, PA, USA, April 14, 2008

Thomson Scientific, a division of Thomson Corporation, announced the Top 20 ranking of Japanese research institutions for all fields based on citation data of academic papers published from January 1997 to December 2007. This includes the Top 10 ranking for each of the four fields in which Japan's contribution is particularly noteworthy.

<http://scientific.thomsonreuters.com/scientific/press/2008/8456489/>

Ten Of Australia's Top Researchers Honoured At Thomson Scientific Research Day and Citation Awards 2008

Canberra, Australia, April 2, 2008

Australia's influence on international scientific research was today recognised by Thomson Scientific, a leading provider of information solutions to the worldwide research and business communities, as it gave Citation Awards to ten of the most pre-eminent researchers working in Australia.

<http://scientific.thomsonreuters.com/scientific/press/2008/8446078/>



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Have your say in the new Citation Impact Center blog

October 2008

The Citation Impact Center features interviews with and commentary from industry leaders – bibliometricians, researchers, and publishers – about scholarly evaluation. The new discussion capability gives you the opportunity to express views about issues that impact your daily work.

Current discussion topics include:

- Why is the h-index one of the hottest topics in information science?
- Can the impact factor be manipulated?
- How do self-citations affect a publication's impact factor?
- Are publishers moving toward individual research metrics?

New articles and analysis are added regularly, building a robust repository of scholarly research evaluation information and opinion.

Visit the Center at scientific.thomsonreuters.com/citationimpactcenter



Increase the visibility and impact of your research using ResearcherID Labs

October 2008

With the ResearcherID Labs environment you can link to your ResearcherID profile and publication list from a variety of online environments and visually explore your collaboration and citation networks.

ResearcherID, available via ResearcherID.com, provides the global research community with an invaluable index to accurate author identification and information. By assigning a unique identifier to each author who participates, *ResearcherID* expressly associates each researcher with his or her published work -- standardizing and clarifying author names and citations and making information searches more straightforward and relevant.

The Labs environment provides advanced tools that help you further understand your personal metrics and promote your work. Using *Web of Science*[®] data from your publication list, the Citing Articles and Collaboration Networks tools graphically display citation and collaboration relationships by author, category, country and more. The *ResearcherID* Badge allows you to link directly to your *ResearcherID* profile and publication list from a variety of online environments, such as a web blog or online CV, further increasing the visibility of your work.

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