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in·no·va·tion [i-nə-'vā-shən]

Function: noun

1: The introduction of something new that solves problems and adds value.

e.g., WIPO's engagement in innovation & climate change

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FOOD SECURITY, CLIMATE CHANGE AND IP RIGHTS

Realizing our potential to produce enough food for the world's expanding population will remain a major challenge in the future and one in which intellectual property (IP) rights will play a key role. **Dr. Alois Leidwein**, Director for Research Coordination, Cooperation & Innovation, the Austrian Agency for Health and Food Safety (AGES) explores the various dimensions of the food security challenge.

Future scenarios

By 2050, the global population is expected to reach 8.9 billion¹ and average per capita food consumption to rise above 3,100 kcal per day, with increased consumption of livestock products. This anticipated 40 percent increase in global population will require a 70 percent increase in agricultural productivity, with a further expansion in crop production to support the increased demand for livestock products. How can this be achieved?

The potential to bring new land into agricultural production is limited. At present, some 1,600 million hectares are under cultivation globally. By 2050, this is expected to rise by just 5 percent (70 million hectares) with the bulk of expansion likely to occur in sub-saharan Africa and Latin America. A word of warning, however – introducing changes in land use requires great caution to avoid irreparable damage to, or the collapse of, ecological systems.

Ninety percent of the required increase in global food production will, therefore, need to come from intensified farming practices and higher yields. But this needs to be done in a sustainable way.

How to boost agricultural production

Data on global crop yields show that, in some regions, many varieties are producing only 30 to 35 percent of what could be agro-ecologically attainable.² Average yields in countries with comparable climate and agricultural production potential can differ by as much as 100 per cent, mainly because agricultural income is insufficient to finance inputs, such as fertilizer, plant protection and infrastructure, needed for increased production.

Increased financial resources for those inputs would boost production relatively quickly, especially in countries with developed agricultural structures.³ In many regions, however, even the higher farm-gate prices witnessed in 2008 and 2010 were insufficient to stimulate increased agricul-

tural investment. Farm prices need to double in real terms to ensure sustainable growth in agricultural production for future food security. There is, however, no silver bullet solution, and other policy approaches might be more relevant for net food importing countries and those with relatively underdeveloped agricultural sectors.

Farmers will increase production if it pays. Seventy percent of the world's poor are farmers or farm workers; rising agricultural prices will help them escape poverty in the medium term. An economically viable agricultural sector where farmers benefit from higher prices and start investing in agricultural services boosts the broader economy.

Steering an even course to minimize the volatility of agricultural markets is a key challenge for agricultural policy-makers. High prices resulting from food shortages are a threat to social stability just as low market prices resulting from oversupply are a threat to agriculture. Smart and pragmatic solutions that are tailored to the particular circumstances of a given country are essential to this task.

Innovating in the face of finite resources and climate change

Modern agriculture depends on fossil fuels for the energy and fertilizers it uses. Given the finite nature of these resources, the only way to increase yields is to enhance efficiency through innovation.

Finding effective alternatives to fossil fuels, for example, is crucial. There is no getting around the fact that agriculture will have to produce its own energy in the future. A key challenge is how to enhance the energy efficiency of biofuels so they become an attractive alternative to fossil fuels in high-input systems and to draft animals in low-input or subsistence agricultural systems.

Greater efficiency in the application and use of nitrogen and phosphorous fertilizers,⁴ and efficient recycling of wastes containing them are other key areas for innovation.

1. Technical paper by Jelle Bruinsma from the Expert Meeting on How to Feed the World in 2050, FAO, Rome, June 24-26, 2009

2. *World Agriculture: towards 2015/2030*, chapter 11, 2003, FAO

3. Cairns Group, Eastern Europe and Russia

4. Nitrogen, phosphorus and potassium are essential for food production and quality.

Crop rotation systems that produce green manure in combination with biological nitrogen fixation offer yet another possible way forward in intensifying production. Biotech solutions such as these will help ensure food security and support climate change mitigation and adaptation in the longer term.

Climate change is likely to compound the challenges confronting agriculture: more erratic climatic conditions; new plant pests and animal diseases; and increased biotic and abiotic stresses on plants may arise as different regions become drier or wetter and less suited to established agricultural practices.

In this context, plant breeding will become increasingly important to ensure that crops are adapted to more challenging environmental conditions. Greater efficiency will also be required in animal production for improved feed conversion rates, efficient use of sewage nutrients and lower methane emissions. Innovation is the key to progress in each of these areas.

Plant breeders have enjoyed remarkable success in increasing the productivity of key crops. From 1960, crop yields have increased globally by 77 percent and in developing countries by 70 percent. Improved soil management and crop rotation systems, fertilization, and plant protection have helped to exploit the genetic potential of new varieties provided by plant breeding.

Sustained agricultural production will also require a re-evaluation by breeders of the merits of crops that are currently considered minor but which may be well suited to biomass production. The natural genetic potential of maize, for example, is all but exhausted. Its high productivity has made it a popular crop for food, feed and bio-fuels but this has resulted in maize monocultures that are increasingly susceptible to pests and disease. An overriding focus on maize breeding in the past has diverted attention away from exploring the genetic potential of other crops for bio-energy production.

Genetically modified (GM) crops and SMART⁵ breeding have a key role to play in accelerating breeding activities on the one hand and adapting plants for enhanced biotic or abiotic stress tolerance and use on marginal soils, on the other hand.

Better varieties, healthy seeds and propagation material, operational sanitary and phytosanitary systems, effective pest management systems and farming techniques, fertilization and trained farm personnel are critically

important for food security. Enhanced food security also requires effective regulatory frameworks for agriculture in areas such as soil and water management, plant variety protection, land tenure, market intervention including public storage, traceability and geographical indications. As the global population peaks, the impact of climate change plays out, and food security issues dominate political discourse, governments may also come to review international trade regulations and support measures.

Intellectual property questions

The challenge of securing the world's food supply calls for further research and incentives to develop innovative agricultural solutions. The revenue potential of intellectual property (IP) rights is a key driver of innovation. In the sphere of agriculture, patent law, plant variety protection rights (breeder's rights) and rights over genetic resources⁶ are particularly relevant.



Photo: FAO/Giulio Napolitano

To ensure global food security, agricultural innovations need to be affordable and farmers need an incentive to adopt them – in sum, the economic benefit of using these technologies needs to outweigh their cost. While some commentators argue that this does not necessarily translate into higher prices per unit of farm produce, it seems clear that if farmers' incomes do not rise in real terms then they will be unable to pay for the new technologies and new varieties required to boost agricultural productivity. If farm-gate prices stagnate the question of access to these technologies is likely to become the subject of hot public debate.

Rising levels of food insecurity are likely to intensify debates about the patenting of seeds and fuel calls for compulsory licensing provisions akin to those estab-

5. SMART=Selection with Markers and Advanced Reproductive Technologies

6. International Treaty on Plant Genetic Resources for Food and Agriculture; and the Convention on Biological Diversity.

Hardest hit by the challenges of climate change will be rainfed agriculture which covers 96 percent of all cultivated land in sub-saharan Africa, 87 percent in South America and 61 percent in Asia. Where stability of production cannot be maintained, people will be forced to migrate.



Maintaining and using this reservoir of genetic diversity will be the foundation of coping with climate change.



Photo: FAO/Alessandra Benedetti

lished to deal with public health crises. Similar debates may also ensue in relation to products that protect plants against pests and disease.

Any debate on seeds must consider the UPOV⁷ system and its flexibilities which reside in exceptions to the breeder's right⁸. The exception to the breeder's right to use protected varieties to breed new varieties without the authorization of the right holder accelerates breeding and innovation. The so-called "farmers' privilege" which UPOV members have the option to introduce into their national legislation can, however, be a double-edged sword. While it sounds reasonable that a small farmer should be able to use seeds produced on his or her own farm without paying a licence fee, excessive use of this exception can have serious implications for plant breeders and their ability to develop locally adapted varieties. Finding the appropriate balance is a thorny but necessary question for agricultural policy-makers.

The provisions of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR) introduce an important perspective to this question. They seek to establish a concrete balance between access to biodiversity for incremental innovation and benefit-sharing to reward farmers for on-farm conservation and management of such biodiversity. The principal aim of the ITPGR is to "facilitate the exchange of seeds and other germplasm for research, breeding, and crop development."⁹ It essentially creates a multilateral gene pool. Those creating commercial products that incorporate its plant genetic

resources must pay a percentage of their profits into a fund used to promote conservation and sustainable use of plant genetic resources except when such a product is available without restriction to others for further research and breeding (e.g. plant varieties protected according to the UPOV system). In such a case a voluntary payment is encouraged. The financial viability of the system hinges on the ability of private parties to be able to create and commercialize derivative products using the bank's materials. In sum, the treaty seeks to manage the intellectual property associated with a defined set of genetic resources resulting from a combination of collective and individual innovation to conserve a public good.

The importance of offering incentives to develop the innovative new technologies that will enable us to meet the challenge of food security in a context of climate change and rapid population growth cannot be overstated. The intellectual property system will, without doubt, have a key role to play in providing the incentives to foster the innovation required if we are to meet this challenge.

7. UPOV – The International Union for the Protection of New Varieties of Plants

8. Art 15 (1) iii UPOV Convention 1991

9. <http://www.fao.org/docrep/007/y5714e/y5714e05.htm>

PROTECTING INDIA'S TRADITIONAL KNOWLEDGE

In just under two years, in Europe alone, India has succeeded in bringing about the cancellation or withdrawal of 36 applications to patent traditionally known medicinal formulations. The key to this success has been its Traditional Knowledge Digital Library (TKDL), a database containing 34 million pages of formatted information on some 2,260,000 medicinal formulations in multiple languages. Designed as a tool to assist patent examiners of major intellectual property (IP) offices in carrying out prior art¹ searches, the TKDL is a unique repository of India's traditional medical wisdom. It bridges the linguistic gap between traditional knowledge expressed in languages such as Sanskrit, Arabic, Persian, Urdu and Tamil, and those used by patent examiners of major IP offices. India's TKDL is proving a powerful weapon in the country's fight against erroneous patents, sometimes referred to as "biopiracy". In this article, **Dr. V.K. Gupta**², the author and architect of India's TKDL, explains the critical role that this unique tool plays in protecting India's traditional knowledge.

The significance of traditional knowledge

Traditional knowledge (TK) is integral to the identity of most local communities. It is a key constituent of a community's social and physical environment and, as such, its preservation is of paramount importance. Attempts to exploit TK for industrial or commercial benefit can lead to its misappropriation and can prejudice the interests of its rightful custodians. In the face of such risks, there is a need to develop ways and means to protect and nurture TK for sustainable development in line with the interests of TK holders. The preservation, protection and promotion of the TK-based innovations and practices of local communities are particularly important for developing countries. Their rich endowment of TK and biodiversity plays a critical role in their health care, food security, culture, religion, identity, environment, trade and development. Yet, this valuable asset is under threat in many parts of the world.

There are concerns that this knowledge is being used and patented by third parties without the prior informed consent of TK holders and that few, if any, of the derived benefits are shared with the communities in which this knowledge originated and exists. Such concerns have pushed TK to the forefront of the international agenda, triggering lively debate about ways to preserve, protect, further develop and sustainably use TK. Documenting and digitizing TK-related information in the form of a TKDL is proving to be an effective means of preserving TK and of preventing its misappropriation by third parties. India is a pioneer in this field.

How it all began

India's TKDL, a collaborative project between the Council of Scientific and Industrial Research (CSIR), and

the Department of AYUSH³, is a home-grown effort to ensure patent offices around the world do not grant patents for applications founded on India's wealth of age-old TK. The idea to establish a TKDL came to the fore amid India's efforts to revoke the patent granted by the United States Patent and Trademark Office (USPTO) on the wound healing properties of turmeric, and the patent granted by the European Patent Office (EPO) on the antifungal properties of neem. These endeavors, while successful, proved extremely costly and time-consuming.

Around the time the TKDL was established in 2001, the TKDL expert group estimated that, annually, some 2,000 patents relating to Indian medicinal systems were being erroneously granted by patent offices around the world.

For a patent to be granted, an applicant must satisfy certain criteria as defined by national patent law, in particular, an applicant must prove that a claimed invention is novel and not previously known. Why then had patents been granted for so many applications relating to Indian medicinal systems? When patent examiners assessed these applications for patentability, the claimed inventions did not feature in the prior art searches carried out. They were, therefore, deemed patentable. At that time, however, much of India's traditional medicinal knowledge only existed in Sanskrit, Hindi, Arabic, Urdu and Tamil. These languages were neither accessible to nor understood by patent examiners working in the major patent offices to which the applications had been submitted.

The fact that so many patents had been wrongfully granted in the U.S. and Europe caused a great deal of national distress. The people of India felt that knowledge belonging to India was wrongfully being taken away from them. On top of this, these "wrong" patents

1. Prior art constitutes all information made available to the public in any form before a given date that might be relevant to a patent's claim of novelty and inventiveness. If an invention has been described in prior art, a patent on that invention is not valid.

2. Dr. V. K. Gupta is Senior Advisor & Director of TKDL at the Indian Council of Scientific and Industrial Research (CSIR), India's largest state-owned research body.

3. In 2003, the Department of Indian Systems of Medicine and Homeopathy (ISM&H) created in March 1995 was renamed the Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy (AYUSH).



conferred exclusive rights to exploit the technology in the country in which patent protection was granted. This posed a very real economic threat to Indian producers and to their freedom to operate in foreign markets.

Bridging the divide

The TKDL has overcome language barriers and is bridging the gaps in TK information in major patent offices. Using information technology tools and a novel Traditional Knowledge Resource Classification System (TKRC), the TKDL has converted and structured ancient texts into 34 million A4-sized pages along the lines of a patent application. These have been translated into English, French, German, Japanese and Spanish.

Today, thanks to its TKDL, India is capable of protecting some 0.226 million medicinal formulations and at zero direct cost. Access to the database helps patent examiners root out those applications that clearly do not satisfy the novelty requirement at an early stage. Without a TKDL database, the process of revoking a patent can be a costly and time-consuming affair. It takes, on average, five to seven years and costs between 0.2-0.6 million US dollars to oppose a patent granted by a patent office. Multiply this by India's 0.226 million medicinal formulations and it is clear that the cost of protection, without a TKDL, would be prohibitive.

An innovative classification system

India's innovative TKRC is modeled on WIPO's International Patent Classification (IPC). It consists of some 27,000 subgroups for Ayurveda, Unani, Siddha and Yoga and, like the IPC, is indispensable for the retrieval of relevant information.

The TKRC has prompted the reform of the IPC – an essential tool in enabling effective search and examination of patent applications – as it relates to TK. The IPC divides technology into eight sections with approximately 70,000 subdivisions each of which is assigned a symbol consisting of Arabic numerals and letters of the Latin alphabet. Until 2005, only one subgroup – A61K35/78 – existed for medicinal plants, meaning that patent examiners were ill equipped to examine traditional medicine-based patent applications.

India took up the lack of recognition for traditional medicines in the IPC's Committee of Experts. Following the establishment of a five-nation 'Traditional Knowledge Classification Task Force' – comprising China, the European Union, India, Japan and the United States – the number of IPC subgroups relating to medicinal plants rose to 207 bringing about a fundamental and far-reaching reform of the international patent system. In 2004, it was agreed to link the TKRC's 27,000 subgroups to the IPC.

Connecting TK holders and patent examiners

The TKDL is a unique, proprietary database that integrates diverse knowledge systems and languages. It is based on 148 books of prior art relating to Indian systems of medicine, available at a cost of around US\$1,000. The TKDL connects patent examiners around the world with these books of knowledge.

The TKDL is available to all patent offices that have signed a TKDL Access Agreement which has built-in, non-disclosure mechanisms to safeguard India's interests and counter any possible misuse. Under such an agreement, patent examiners may use the TKDL for search and examination purposes only and its contents may only be revealed to third parties for the purposes of citation.

So far, India has signed TKDL Access Agreements with the EPO and the patent offices of Australia, Canada, Germany, the United Kingdom and the United States. Negotiations are also ongoing with the patent offices of New Zealand and Japan where agreement in principle has already been reached.

Global IP-watch systems

The national patent laws of most countries allow for third parties – any member of the public – to file a submission questioning the novelty and non-obviousness of a patent application before a patent is granted. There is a need, therefore, to ensure that patent applications that wrongly claim rights in prior art are readily identifiable so that such "third party observations (TPOs)" can be filed and made easily searchable. Global IP-watch monitoring systems have an important role to play

Comparison of time and costs associated with post-grant opposition and pre-grant opposition based on the submission of prior art evidence supported by TK documentation

No.	Methodology & Process	Post-grant Opposition	Pre-grant Objections supported by a database such as TKDL
1.	Nature	Opposing party is part of re-examination process, can submit counter documents & participate in re-examination and hearing process.	Objecting party can only file evidence as a third party and cannot participate in the examination process.
2.	Cost	Highly expensive and requires legal assistance.	Inexpensive and does not require legal support because prior art evidence is available from the TKDL.
3.	Time period	4 – 13 years	3 – 20 weeks
4.	Documentation	Does not require extensive documentation.	Requires extensive digital documentation.
5.	Patent	Applicant can appeal invalidation of the patent.	Patent applicant cannot appeal as the application is rejected at the pre-grant stage.

in enabling the identification of published TK-related applications on which third parties – in accordance with the patent law of the country concerned – may file observations.

To date, the submission of TPOs has proven the only cost-effective way of preventing misappropriation of TK at the pre-grant stage. The TKDL database has enabled the submission of TPOs that have resulted in the successful opposition of hundreds of patent applications filed around the world. Without documenting and digitizing TK and making these databases easily accessible to patent examiners operating in the major languages of commerce, this would not have been possible.

The TKDL has an integrated global biopiracy watch system that allows monitoring of patent applications related to Indian medicinal systems. It enables effective detection of attempts to misappropriate this knowledge by third parties filing applications with patent offices around the world. It means that immediate corrective

action can be taken, and at zero direct cost, to prevent biopiracy. India is the only country to date to have put such a system in place.

Impact of TKDL on biopiracy

The TKDL's impact is already being felt at the EPO. Since July 2009, 215 patent applications relating to Indian medicinal systems for which third party TKDL evidence has been filed have been identified. In two such cases the EPO has already reversed – on the strength of TKDL evidence – its earlier intention to grant the patents. In one case the applicant modified the claims submitted and, in 33 other cases, the applicants themselves withdrew their four to five-year-old applications upon presentation of TKDL evidence.

It is expected that in the coming months some 179 cases that are currently in the balance will either be rejected by the EPO or withdrawn by the applicants. A



TKDL outcomes against bio-piracy



Photos: iStockphoto Kevin Jeon - Narcisia - Fotografia Basica - Gomez David

Clockwise from top left: green tea; pomegranates, pink lotus, turmeric root

recent study by a TKDL expert team at the EPO shows a sharp decline (44 percent) in the number of patent applications filed concerning Indian medicinal systems, particularly in relation to medicinal plants. The TKDL is clearly proving to be an effective deterrent against biopiracy.

Misappropriation of TK and biopiracy of genetic resources are of great concern to many countries and indigenous and local communities. While these issues have been taken up within various multilateral forums such as the Convention on Biological Diversity (CBD), the TRIPs⁴ Council of the World Trade Organization (WTO) and at the World Intellectual Property Organization (WIPO), a global framework to protect TK has not yet been established. WIPO's IGC⁵ is, however, making progress and it is hoped that in the near future consensus will emerge on an internationally legally binding instrument to effectively protect TK.

4. TRIPs – Agreement on Trade-Related Aspects of Intellectual Property Rights

5. IGC – Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore

A success story

India is the only country in the world to have set up an institutional mechanism – the TKDL – to protect its TK. The TKDL enables prompt and almost cost-free cancellation or withdrawal of patent applications relating to India's TK.

To date the TKDL has enabled the cancellation or withdrawal of a large number of patent applications attempting to claim rights over the use of various medicinal plants. India's TKDL is a unique tool that plays a critical role in protecting the country's traditional knowledge.

THE AMENDED GOOGLE BOOK SETTLEMENT: JUDGE CHIN'S DECISION

On March 22, 2011, Judge Denny Chin issued his long-awaited decision on the proposed Google Book Amended Settlement Agreement stemming from a class action lawsuit brought by authors and book publishers in 2005. **Ms. Marybeth Peters**, former United States Register of Copyrights (1994 to 2010) takes a closer look at the Amended Settlement Agreement and Judge Chin's decision.

The class action lawsuit brought by authors and book publishers against Google in 2005 alleged willful copyright infringement in connection with Google's systematic reproduction, without permission, of millions of copyrighted books, in their entirety. Google accomplished this through scanning operations set up in large research libraries, such as those of the universities of Michigan, Stanford and Harvard. Once scanned, the books were indexed electronically, allowing users of Google to search by title and other bibliographic information and to view "snippets" – several lines of copyrighted text. While Google's search engine is free to users, Google collects substantial revenue from the advertising that appears on its web pages, including those on which images of, and information from, copyrighted books appear. At least 15 million books have been scanned by Google, the vast majority of which are still protected by copyright. Google argued that its actions were covered by fair use.

About class actions

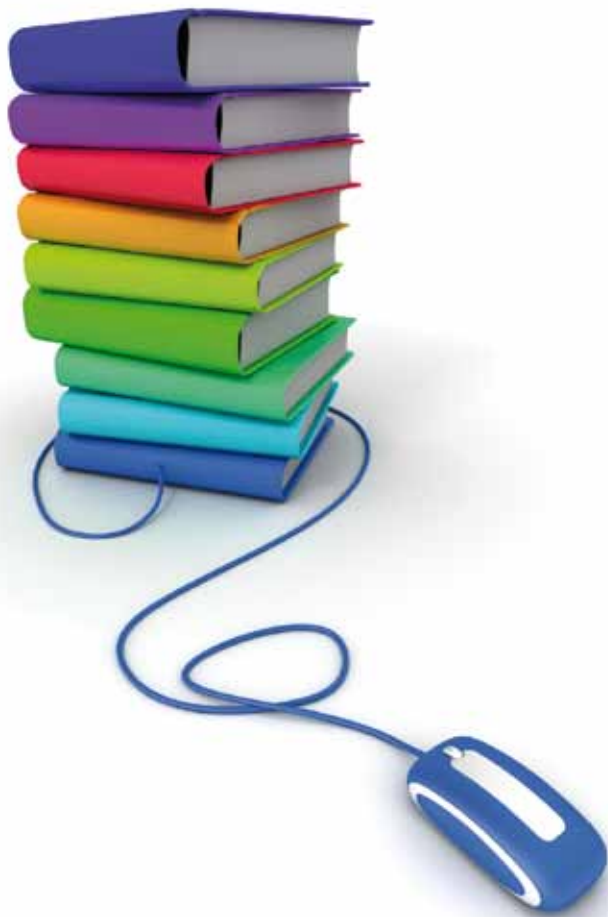
A class action is a form of lawsuit in which a large group of people collectively file a single action. It originated in the United States, where it is widely used. A limited number of European countries allow class actions, typically when a large number of consumers are involved. In the United States, class actions are governed by Rule 23 of the Federal Rules of Civil Procedure. To proceed as a class action, the questions of law or fact must be common to all, as must the claims or defenses of the representative parties. A settlement agreement approved by the court will bind everyone, with the exception of those who effectively opt-out. Class actions have been relatively rare in copyright infringement cases.

The US\$125 million settlement agreement, announced on October 28, 2008, was preliminarily approved on

November 17, 2008, by Judge Sprizzo. A complex document of hundreds of pages, including numerous appendices, it went far beyond the alleged acts of infringement and created extensive new business models for Google. It applied to huge numbers of authors and books. Specifically, for books first or simultaneously published in the United States, it applied only to those that had been registered with the United States Copyright Office. However, for all other books, it applied to all those published anywhere before January 5, 2009. Obviously, an extremely large number of foreign works was included. To be excluded from the agreement, authors and copyright owners had to opt-out of the settlement agreement on a title-by-title basis – a complicated process – by early May 2009. This and other dates were reset after outcries from affected parties. The last day to effectively opt-out of the settlement was fixed for September 8, 2009; the court hearing, or "fairness hearing," was scheduled for October 7, 2009.

In a class action settlement agreement, the judge must decide whether the agreement is "fair, adequate and reasonable". There was much opposition to the Google agreement, including from the governments of the United States, Germany and France and from numerous authors, publishers, literary agents, technology companies and others. Google and the litigating parties became concerned. This led to many meetings with those unhappy with the terms of the settlement, and various compromises requiring changes to the agreement were reached. The last official filing was the Statement of Interest of the United States on September 18, 2009. After a meeting with the parties, the United States brief was adjusted to not only express its legal concerns about the scope of the agreement but, because of the potential benefits included in the settlement, to urge the court to postpone the hearing to give the parties the opportunity to revise the agree-





ment. On October 7, 2010, Judge Chin postponed the fairness hearing and set a new date for the submission of a revised settlement agreement. This was submitted on November 13, and preliminarily agreed on November 27. New notices describing the revised agreement were published, and new time frames were announced for opting-out, filing objections and for the date of the fairness hearing.

The revised settlement addressed a number of concerns. For example, the scope of foreign works it covered was significantly reduced. It included only foreign works registered with the United States Copyright Office as well as those not registered in the United States but published in Australia, Canada and the United Kingdom before January 5, 2009. It called for an "Unclaimed Works Fiduciary," subject to court approval, to protect owners of unclaimed works. Another provision served to eliminate the most-favored-nation provision which would have given Google optimal license terms in the future.

Most of the original objectors continued to object, but a few withdrew their objections. However, there were many new objectors, including many authors, and some additional grounds for objection. The governments of the United States, Germany and France continued to object. While noting the benefits the settlement would

create and applauding some of the changes, the United States voiced strong objections to the amended settlement agreement on both copyright and competition grounds.

The fairness hearing was held on February 18, 2010, in New York City. Judge Chin, who by this date had become a judge on the Court of Appeals for the Second Circuit, was sitting by designation as a judge in the Southern District of New York. Before him were two motions – the first for final approval of the proposed "Amended Settlement Agreement" and the second for attorneys' fees and costs.

The issue was whether the revised agreement was fair, adequate and reasonable. The parties, the governments of the United States and Germany and many objectors testified. Then the waiting and speculation began. Finally, more than 13 months later, Judge Chin issued his opinion. He denied both motions before him, concluding that the amended settlement agreement, while containing many positive outcomes, was not fair, reasonable and adequate. It simply went too far.

In a 46-page opinion, Judge Chin focused on:

- whether there was adequate representation of those who would be affected by the decision, and
- the appropriateness of the scope of the relief to be granted.

With respect to adequate representation, he was troubled by the large number of objections as well as their nature. He referred to the objection and testimony of Professor Samuelson¹ and identified academic authors as having different interests from those of the representative plaintiffs. He also referred to letters from individual authors, several literary agents and David Nimmer², who objected to the idea that the burden was being placed on the authors to object instead of on Google to secure permission.

With respect to the scope of relief to be granted, Judge Chin said the lawsuit was about the scanning of books and display of snippets, while the settlement agreement would implement "a forward-looking business arrangement that would grant Google significant rights to exploit entire books, without permission of the copyright owners." He added, it "would give Google a sig-

¹ Professor Pamela Samuelson is the Richard M. Sherman Distinguished Professor of Law, University of California, Berkeley School of Law

² David Nimmer is a renowned United States copyright law expert.

nificant advantage over competitors, rewarding it for engaging in wholesale copying of copyrighted works without permission, while releasing claims well beyond those present in the case.”

He expressed concern about the fundamental structure of the settlement from a copyright perspective. Copyright owners have a right to decide what to do with their works, including doing nothing. Under the amended settlement, if copyright owners sit back and do nothing, they lose their rights. One way to remedy this would be an opt-in provision.

He said that the treatment of orphan works – works whose copyright owner is unknown or unlocatable – is a copyright policy issue which should be resolved by Congress, not the courts. The settlement agreement would undermine Congress’s authority to legislate by reallocating the burdens on creators and users of creative works under the federal copyright law.

With respect to the international complaints, he noted that, while the number of foreign works was reduced in the amended settlement agreement, many were registered in the United States and would therefore be included. He also observed that foreign right holders were at a disadvantage in determining whether or not their books were included in the settlement. While not saying there were any international copyright violations, he did seem to suggest that foreign right holders’ concerns were one more reason to deny the agreement.

On the anticompetitive aspects of the settlement, he noted the United States government’s concern that Google would have “a de facto monopoly over unclaimed works” and would also have a unique position with respect to online book searches.

So what’s next? Judge Chin has scheduled a conference with the parties for June 1, 2011. He has clearly left the door open for the parties to renegotiate a new agreement and to submit it for consideration under Rule 23. The publishers and the authors have expressed their willingness to do this. Google has not indicated such willingness.

While an opt-in provision would address many of Judge Chin’s concerns, such a change is unlikely. The opt-in

solution was mentioned by the Register of Copyrights in her congressional testimony, by the United States government in its Statement of Interest and by many others. Google, however, has repeatedly rejected such an idea, saying it would reduce the class of works too much.

The copyright infringement litigation could go forward. However, this brings with it risks, expenses and delays for all parties.

With Judge Chin’s approval, there could be an appeal to the Court of Appeals for the Second Circuit. Judge Chin would, of course, not participate in such an appeal.

Some of the issues, such as orphan works, could be addressed by the United States Congress. In a previous Congress, the Senate passed such a bill, but the House of Representatives did not. The landscape, however, has changed, in large part because of the Google Book litigation.

Issues about digital libraries and library exemption in the United States Copyright Law have been raised. While the exemption needs to be updated, it seems clear that many future digitization activities will require licenses or permissions. Timely and efficient licensing systems, including collective management, will be critical.

With or without a settlement agreement, there are many issues to be addressed and many opportunities for solutions to emerge. It is to be hoped that developments in the next year or two will provide some answers.



WIRELESS TECHNOLOGIES:

Making a Difference

As the world leader in developing next-generation mobile broadband technologies, Qualcomm Incorporated has invented many of the wireless technologies at the center of the unprecedented growth in mobile voice, data and Internet services. The company's technologies are integral to mobile phones, tablets, e-readers, mobile applications and other wireless devices and services used by billions of people worldwide. **Donald J. Rosenberg**, Executive Vice President & General Counsel for Qualcomm, discusses the importance of intellectual property (IP) to Qualcomm and how the company is working with local partners in many countries to foster entrepreneurship and social goals through its Wireless Reach initiative.

Patents create opportunities and drive growth

Founded in 1985 by seven people in San Diego, California, Qualcomm began without a specific product in mind but with the determination to innovate in digital and wireless communications. That innovation came in the form of a mobile technology called Code Division Multiple Access (CDMA) which, at the time, was widely perceived as promising but risky. To cover the costs of commercializing CDMA, Qualcomm began licensing its growing portfolio of patents to cellular phone and equipment manufacturers.

The promise of CDMA technology combined with the strength of the company's steadily expanding patent portfolio, helped drive Qualcomm's rapid rise from a startup with a handful of employees to the world's largest supplier of chips for cell phones. Today, the company has more than 18,500 employees in 146 offices around the world and annual revenues of US\$11 billion. The bulk of revenues are derived from the sale of chips and related software, but a sizeable proportion is generated through royalty-bearing licensing agreements to use Qualcomm's inventions.

Innovations and technology advancements in mobile broadband have enabled the wireless industry to impact almost every aspect of people's lives. More than 5 billion people now own a mobile device and of those, more than 1.2 billion have a third-generation (3G)-enabled¹ device using Qualcomm's patented technology. The mobile phone has become the largest information platform in the history of humankind.

The ability to broadly license the technology worldwide to more than 190 suppliers of wireless devices, equipment and related software applications and to earn a reasonable return on investment from licensing the



Photo: Qualcomm Inc.

patents is critical for Qualcomm. The royalty revenues generated by these activities allow the company to sustain high levels of investment in research and development (R&D) – approximately 20 percent of global revenues (chip sales and patent licensing combined) – and drive new innovation. This uninterrupted cycle of investment in R&D, securing patents for new inventions, licensing patents and reinvesting revenues has been called a “virtuous cycle” of risk, innovation and reward.

Qualcomm's business model – broadly licensing our technology and reinvesting in R&D – is enabling the success of many other companies in the wireless value chain. As a consequence, an increasing number of wireless devices and applications with ever-expanding functionality are commercially available at lower cost. This makes these cutting-edge technologies and the services they empower accessible to an ever-growing number of the global population. The wide diffusion of Qualcomm's inventions has generated competition among service providers and device suppliers, enhancing consumer choice and unleashing new economic opportunities for down-stream enterprises, as well as fostering the achievement of social goals, particularly in price-sensitive developing economies. For example, India is enjoying some of the lowest prices for 3G service in the world, at less than 2 euros per month for a 100MB

In his role as General Counsel, Mr. Rosenberg is responsible for overseeing Qualcomm's worldwide legal affairs including litigation, IP and corporate matters.

1. 3G – a generation of standards for mobile phones and mobile telecommunications services fulfilling the International Mobile Telecommunications-2000 (IMT – 2000) specifications which include a range of application services such as wide-area wireless voice telephony, mobile Internet access, video calls and mobile TV, in a mobile environment.

voice and data package. The proliferation of 3G networks in India has led to the availability of affordable and highly capable smartphones that were previously considered a premium device for a select few.

Improving people's lives

In emerging markets, mobile devices are often the only way for people to access the Internet. The convergence of Internet access and mobile connectivity is immense, and the momentum behind mobile broadband will help it to surpass the total number of fixed broadband subscribers in the world in a relatively short time. By 2014, it is estimated that more than 75 percent of broadband connections globally will be through mobile wireless services.²

This is attractive for developing markets in particular, because countries adopting mobile broadband technologies experience higher levels of gross domestic product (GDP) per capita. According to the World Bank, a 10 percent increase in mobile penetration increases per capita GDP in developing countries by 0.8 percent. A 10 percent increase in Internet penetration increases per capita GDP in these countries by 1.4 percent.

The belief that access to 3G and next-generation mobile technologies can improve people's lives prompted Qualcomm to develop Wireless Reach™,³ a strategic initiative that brings wireless technology to underserved and "underconnected" communities globally.

Working with local partners in a wide range of countries, Wireless Reach invests in projects that foster entrepreneurship, support public safety, enable the delivery of quality and efficient health care, enrich teaching and learning and improve environmental sustainability.

Helping fishermen in India

Fishermen in Puducherry, a coastal state in southeast India, have practised and perfected their craft for generations. However, changing environmental conditions and the devastating impact of the 2004 Indian Ocean tsunami on the local economy have given rise to a new generation of fishermen who are using wireless technology to improve their businesses.

In 2007, fishermen in Puducherry and neighboring Tamil Nadu received mobile phones preloaded with a software application called Fisher Friend. Based on Qualcomm's Brew® operating system, Fisher Friend provides instant access to helpful information such as weather conditions, fishing locations and real-time market prices – in the local language.

Project participants using Fisher Friend said the application made them feel safer on the water, has allowed them to be more efficient, and has improved their daily revenue. Devanathan, a fisherman in Puducherry, said thanks to Fisher Friend there are days when the value of his catch rises from an average Rs 200-300 a day (approximately US\$3 to \$6) to Rs 500-800 a day (approximately US\$10 to \$16).

The next phase of the project, to be launched later this year, will enable fishermen to benefit from a stand-alone GPS application, designed to ensure greater safety and quicker search and rescue in the event of a crisis.

The success of the Fisher Friend initiative in India has led to a similar project in Brazil. The aim is to promote economic development, enhance the safety of fishermen and help to bolster Brazil's fishing industry which has suffered from over-fishing and lack of investment in recent years.

Wireless Reach is working with the *Instituto Ambiental Brasil Sustentável*, a Brazilian non-governmental organization that manages projects in support of sustainable development, to create a system that integrates mobile and web-based applications on handheld devices. Fishermen in Santa Cruz Cabrália have been provided with devices that allow them to connect directly, via voice and data, from offshore to consumers and business partners on land. In addition to valuable business information – direct sales, data collection and technical support – the customized software provides information about navigation and weather conditions for improved safety.

Boosting public safety in El Salvador

Wireless Reach is working with RTI International, the United States Agency for International Development (USAID), the Municipality of Santa Tecla and the National

2. Wireless Intelligence, ABI and the Yankee Group.

3. http://www.qualcomm.com/citizenship/wireless_reach/



Civilian Police in El Salvador, to support a project called Seguridad Inalámbrica (Wireless Security). This new system uses 3G technology to collect and instantly share vital public safety information.

The project provides a potential solution to a pressing crime problem. Central America registers the world's highest rates of non-political violence and has an overall homicide rate that is over three times the world average.

Law enforcement officers have been equipped with 3G-enabled mobile devices and applications that allow them to report crime from the nearest possible location to the crime scene, and to immediately transmit the data to a crime-mapping database. This enables the multiple enforcement organizations that operate in Santa Tecla to coordinate their response. For example, the National Civilian Police force often works with the Corps of Metropolitan Agents. As each has different responsibilities and jurisdictions, sharing information is critical. Data are also displayed on detailed maps, and analyzed by officials to identify high-risk locations and changes in crime patterns allowing the police to track the impact of prevention programs and the prompt allocation of resources.

The partner organizations hope to improve public safety in Santa Tecla and, eventually, to expand the new crime reduction solution to other municipalities in El Salvador.

Assisting nurses in South Africa

In South Africa, where access to relevant health information and broadband Internet connectivity is limited, nurses at the Port Elizabeth Hospital Complex on the eastern cape of South Africa are using 3G wireless technology to provide better care for patients.

The Mobile Health Information System (MHIS) project is designed to improve the ability of health workers in urban and rural settings to care for their patients by providing locally relevant, reliable and accurate clinical information at the point of care using smartphones preloaded with relevant resources. Nurses are trained to use the smartphones to access and share information with colleagues. A comprehensive evaluation of the system by the Nelson Mandela Metropolitan University showed that enabling nurses to access health resources in this way significantly improved their ability to care for their patients.

"I found the device most valuable when we did not have a doctor for months at a time in our clinic. As some of the clients have chronic conditions such as hypertension, diabetes, and epilepsy, I used the device to check if prescribed chronic medication is not contraindicated when using ARVs⁴. On many occasions I have had to advocate for patients regarding drugs prescribed by our doctor who was new to the HIV program," said Rochelle Gelandt, Registered Nurse at the Livingstone Hospital Wellness Clinic, a comprehensive care and management facility for HIV/AIDS infected clients (adults and children).

Transforming the workforce in Nepal and Viet Nam

To better prepare the future work forces of Viet Nam and Nepal, Wireless Reach supports two projects that aim to improve education through wireless Internet access.

In collaboration with Room to Read (a global nonprofit organization committed to promoting literacy and gender equality in education), Nepal Telecom (the country's largest telecommunications company) and S-Fone (a local 3G network operator in Viet Nam), Wireless Reach is supporting projects that have established five wireless computer labs in the Kaski and Kavre regions of Nepal and six others in secondary schools in the Can Tho province of southern Viet Nam. The computer labs are equipped with 20 to 25 computers and high-speed 3G network connectivity using wireless modems.

Training sessions were held for teachers, and students are now able to attend classes where they can access educational content on the Internet, learn how to use various computer applications and acquire basic information technology skills. Each school has been raising money for a Computer Lab Development Fund to support lab management and maintenance of equipment after the pilot ends. This gives the community a sense of ownership and offers participating schools an opportunity to develop sustainability plans for the labs. The computer labs and the Internet access they provide have been life-changing for students from low-income families attending the participating schools in locations without landline connectivity.

"In this increasingly connected world, providing the opportunity for students to have dependable access

4. ARVs – Antiretroviral drugs used for the treatment of HIV/AIDS.

Photos: Qualcomm Inc.



PCT passes 2 million mark

In April 2011, Qualcomm filed the two millionth international patent application under the PCT, a mechanism that makes it easier for companies and inventors to seek patent rights in the 143 countries bound by the Treaty. The PCT consolidates and streamlines patenting procedures, postponing the payment of sizeable costs and providing applicants with a sound basis for important decision-making. Qualcomm has been using the PCT system since 1988 and has since filed nearly 9,000 PCT applications – making it one of the PCT's most active users.

The two millionth international application is a Qualcomm invention that helps emergency responders to locate victims through wireless navigation in areas where traditional GPS signal reception is more difficult.

It took 26 years to reach the millionth international patent application under the PCT, which was filed in January 2005, and just 6 further years to reach the 2 million mark. This, WIPO Director General Francis Gurry said, "reflects continuously increasing investments in innovation and the growing importance of protecting innovation outputs in international markets."

In 2010, international patent filings under the PCT increased by 4.8% with strong growth from China (56.2%), the Republic of Korea (20.5%) and Japan (7.9 %).

to the Internet in their early school life initiates a completely new dimension in providing basic schooling needs to children," said Amar Nath Singh, managing director of Nepal Telecom.

The four cases mentioned above are examples of the 64 projects in 27 countries that Qualcomm's Wireless Reach initiative has implemented since 2006 to demonstrate the ways in which mobile broadband technology can improve people's lives.

Enabling economic opportunity – the PCT route

Qualcomm's experience in using WIPO's Patent Cooperation Treaty (PCT) illustrates the close relationship between innovation, patent protection and enabling economic opportunity and growth – not just for the benefit of the inventor, but also for entire industries, communities and nations.

All stakeholders – governments, industry, NGOs, academia and other international institutions – have a shared interest in preserving incentives to innovate and diffuse new and useful inventions. As Qualcomm's founder Dr. Irwin Jacobs once said: "Without such incentives, we will measure the cost by the bells that don't ring, the cures that are not developed and the technologies that are not invented. In the long run, society will be the poorer for it."

Qualcomm applauds WIPO's global efforts to promote the proliferation of technical innovation through effective IP rights. An effective patent system is a critical component of the information age which has been flourishing for over half a century. It is vital to ensuring access to the latest inventions that drive economic development throughout the world.

MEDICINES PATENT POOL:

Facilitating Access to HIV Treatment

Access to HIV¹ treatment is beyond the reach of millions in resource-poor settings, and many patients already on treatment cannot afford the newer medications they require to stay alive. **Ellen 't Hoen, Esteban Burrone** and **Kaitlin Mara**² explain how a new foundation aims to change that. Using an innovative licensing mechanism, the Medicines Patent Pool aims to make HIV medicines more affordable in developing countries and to facilitate the development of new medicines, including formulations for children.

The Medicines Patent Pool, the first of its kind for HIV drugs, could have a significant impact on the lives of the estimated 33.3 million people living with HIV, as well as those who become infected in the future.

Established with the support of UNITAID in July 2010, the Medicines Patent Pool recently concluded a license agreement with the United States National Institutes of Health (NIH), and is currently in negotiations with several other patent holders who have shown interest in collaborating with the Pool.

Averting a treatment crisis

Today, only a third of the people requiring treatment for HIV/AIDS have access to it. Drug resistance means that such treatment may not be effective forever. New drugs are, therefore, required to treat the condition, but these are often unaffordable for the most affected communities.

"We are sitting on a treatment time bomb," states a 2009 report by the United Kingdom's All-Party Parliamentary Group on AIDS³, as the future needs of people with HIV will overwhelm the resources allotted to treat them, threatening to "cripple developing economies, or place unbearable strains on richer countries trying to support them." The number of people needing medicines is expected to rise dramatically, and the medicines needed are often too expensive.

Increases in the number of people receiving treatment offer some hope. In 2009, some 1.2 million people (a 20 percent increase on figures for 2008) were treated for the first time meaning that treatment is now reaching a much greater proportion of the infected population than ever before. Recent research and development (R&D) efforts have also resulted in the development of new antiretroviral medicines and new therapeutic classes of drugs that enhance the treatment options available to people living with HIV.

That said, some 2.6 million new HIV infections were recorded in developing countries in 2009 alone. Increasing numbers of patients are also developing resistance to first-line drugs and need access to second-line medicines that are significantly more expensive. Special formulations – such as fixed-dose combinations (FDCs), where several medicines are combined into one pill – are also needed, particularly in developing countries, to simplify treatment and support treatment adherence in resource-poor settings. Perhaps most striking is the plight of children infected with HIV. As of 2009⁴, an estimated 2.5 million children were infected with the virus and some 85 percent of them did not receive any treatment. Children with HIV live almost exclusively in developing countries, where few market incentives exist to develop the adapted formulations required to treat them.

The 2009 U.K. parliamentary report called on pharmaceutical companies to sign up to mechanisms like the Medicines Patent Pool to avert the "treatment time

1. Human immunodeficiency virus (HIV)

2. Ellen 't Hoen, Executive Director, Esteban Burrone, Policy Advisor and Kaitlin Mara, Communications Manager, Medicines Patent Pool

3. <http://www.aidsportal.org/repos/APPGTimebomb091.pdf> [pdf]

4. UNAIDS

5. <http://www.ip-watch.org/weblog/2010/11/05/sharing-us-drug-patents-with-neglected-patients-a-scientists-view/>

The NIH license

In September 2010, the NIH, the world's largest biomedical research institution, became the first entity to license patents to the Medicines Patent Pool. The license relates to the protease inhibitor class of HIV medicines used primarily to treat drug-resistant HIV infection. While the license does not by itself clear the way for the production of any product, because additional licenses are required from other patent holders, it does represent a critical first step. The license stipulates that this technology is to be available for the benefit of all low and middle income countries (as defined by the World Bank) and is royalty-free.

"One of the most gratifying outcomes for a scientist is to see that our work has made a real difference in people's lives," explained John Erikson, co-inventor of the technology licensed by the NIH, as well as CEO of Sequoia Pharmaceuticals, a company that owns IP rights over promising pipeline drugs for the treatment of HIV. "I applaud the NIH, and hope that other pharmaceutical companies and public research institutions will follow its lead," concluded Erikson.⁵

bomb.” The report said, «we must not sleep walk into a situation where treating even a small proportion of those with HIV is unaffordable.»

Ensuring that this does not happen will require sustained efforts from a wide range of stakeholders, as well as innovative approaches to treatment delivery and sustained international funding for HIV treatment. Another important element will be the development of new ways of managing the intellectual property (IP) associated with HIV medicines to ensure people in developing countries benefit without delay from innovations in HIV treatment.

The changing IP landscape

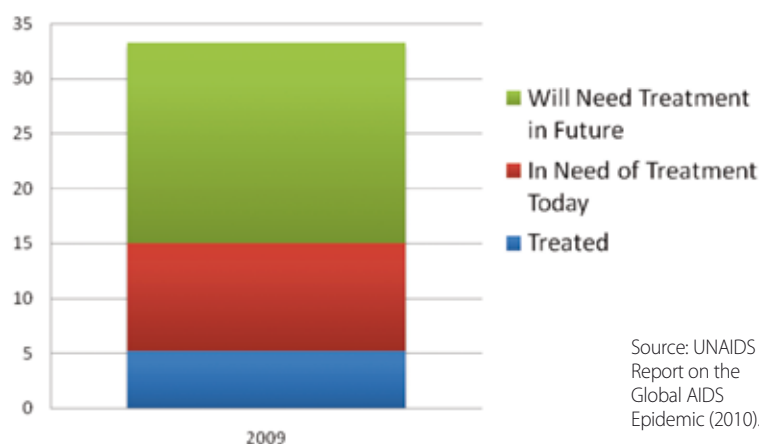
In recent years, the IP landscape has changed significantly in developing countries, in particular following the implementation of the WTO TRIPS Agreement. Prior to this, many developing countries did not provide patent protection for pharmaceuticals, meaning that many early first-line antiretroviral medicines were not patented in those countries. In some developing countries, a number of factors, including the presence of manufacturing capacity, low production costs, an effective commercial strategy and the absence of patents on pharmaceuticals supported the development of a strong generic drugs industry. The resulting large-scale competition among generics manufacturers around the world led to lower prices for HIV medicines, pushing the cost of first-line treatments down by 99 percent over the past decade.

A recent study published in the *Journal of the International AIDS Society* found that over 80 percent of donor-funded antiretrovirals available in developing countries since 2006 were produced by generic drug manufacturers in India.

New IP legislation allowing for pharmaceutical product patents has been enacted in many countries, and patenting of medicines has become more widespread, particularly in developing countries with the capacity to produce low-cost generic versions of HIV drugs.

This changing IP landscape and the persistent need to maintain robust generic competition underlines the need for a framework that facilitates the conclusion of licensing agreements in a way that both addresses the public health needs of developing countries and ensures a fair return for patent holders. The Medicines Patent Pool provides just such a framework. It plays a key role in securing licenses to produce the low-cost treatments required in resource-poor settings – particularly in relation to second

People living with HIV/AIDS in Developing Countries



Source: UNAIDS Report on the Global AIDS Epidemic (2010).

and third-line drugs, the next generation of first-line drugs and the development of adapted formulations, including paediatric formulations needed in many developing countries.

How can the Patent Pool help?

The Medicines Patent Pool solicits voluntary licenses from patent owners of antiretroviral medicines to create a pooled resource. Drug manufacturers, developers and innovators can then access the rights they need to manufacture or develop the new and adapted formulations required for sale in developing countries. The Medicines Patent Pool solution works for both public health and pharmaceutical manufacturers and innovators.

This arrangement eliminates the uncertainty and expense of negotiating licenses in a context where several different patent holders may hold rights in a single drug or treatment.

For right holders, it offers royalty streams from a wide variety of different countries and provides a collaborative platform for enhancing access, and developing the formulations required, in developing countries. The Pool operates within the existing IP framework on which pharmaceutical companies have built their business models, and its scope of work is limited to developing countries. As such, it does not affect higher-income markets.

For innovators focused on developing country markets, such as drug development partnerships, the Patent Pool brings down the price of licensing knowledge to create the new medicines required.

About UNITAID

The mission of UNITAID, an innovative financing mechanism hosted by the WHO, is to contribute to scaling-up access to treatment for HIV/AIDS, malaria and tuberculosis, primarily for people in low-income countries. It leverages price reductions for quality diagnostics and medicines thereby accelerating the pace at which these are made available.



Prioritizing HIV medicines

The initial selection of products to be targeted by the Medicines Patent Pool was developed in 2009 by UNITAID and the WHO, and presented to the WHO Expert Committee on the Selection and Use of Essential Medicines. The prioritization included 19 current and pipeline antiretrovirals, as well as other formulations that could be developed through the patent pool.

In February 2011, the Medicines Patent Pool, UNITAID and the WHO revised the list, and work is ongoing to further prioritize and identify those products that could have the greatest impact in developing countries: see http://www.who.int/selection_medicines/committees/expert/18/policy/policy4/en/index.html.

For people living with HIV/AIDS, most importantly, robust competition for the products they need helps make the medicines more affordable. Licensing through the Patent Pool also promises to promote the development of adapted formulations such as heat-stable products, lower-dose formulations, paediatric medicines and fixed-dose combinations.

Patent pools and pharmaceuticals

While patent pools are well established in some technological areas, such as telecommunications, they are relatively new in the pharmaceutical field. In 2008, the World Health Organization (WHO) recognized the important role patent pools can play and called for an examination of “the feasibility of voluntary patent pools... to promote innovation of and access to health products and medical devices.”⁶

Other patent pools in the pharmaceutical field include attempts to establish a patent pool for the viral illness SARS (severe acute respiratory syndrome), a patent pool for neglected tropical diseases by drug manufacturer GlaxoSmithKline and one for diagnostic genetics by the MPEG-LA, which creates patent pools for technical standards and other technology platforms.

The Medicines Patent Pool was established with the support of UNITAID. The world’s largest donor for the purchase of paediatric HIV treatment, UNITAID is a key player in the market for second-line HIV therapy. The Medicines Patent Pool has attracted support from a wide range of national governments, civil society groups and

international organizations. Collaboration with WIPO has also been central to the Pool’s development.

Terms and conditions

While licensing terms and conditions of the Patent Pool are the subject of negotiations with patent holders, the Pool has defined certain guiding principles. For example:

- licenses will be made available on a non-exclusive basis to enhance competition and to facilitate the development of new formulations, including paediatric formulations and fixed-dose combinations;
- licensors will receive royalties that may be adjusted in line with a country’s disease burden and its capacity to pay;
- the scope of work of the Medicines Patent Pool is limited to low and middle income countries, and reasonable rates of remuneration will be explored to expand the benefits of the licenses to as many low and middle income countries as possible;
- the Pool will rely on existing mechanisms, such as the WHO’s Prequalification Program for quality assurance; and
- the terms and conditions of licenses will be made public.

The Medicines Patent Pool has the potential to help save and improve the lives of millions of people living with HIV. But it can only do so if all stakeholders collaborate, in particular patent holders and pharmaceutical manufacturers. The need is urgent – and growing. Spiraling treatment costs if left unaddressed risk threatening even those currently receiving treatment. Now is the time to avert the “treatment time bomb” – before it is too late.

WIPO and the Medicines Patent Pool

WIPO’s collaboration with the Medicines Patent Pool has been essential. In September 2010, WIPO and UNITAID organized a workshop that brought together licensing experts from around the world to highlight different options for structuring the terms and conditions of Medicines Patent Pool licenses. WIPO has also provided significant assistance in identifying the status of patents on antiretrovirals in a large number of countries, and is currently mapping patent landscapes for specific HIV medicines in the context of a WIPO Development Agenda project.

The Medicines Patent Pool is committed to making available on its website all of the patent information on antiretrovirals it has collected in partnership with WIPO for the benefit of other public health actors. The “Patent Status Database for Selected HIV Medicines” was launched on April 4, 2011 and is available at www.medicinespatentpool.org.

6. WHO Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property, 2008.

OPTIMIZING THE USPTO TO BOOST GROWTH

The United States Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office (USPTO), **David J. Kappos**, explains what the USPTO is doing to ensure that groundbreaking ideas reach the market quickly.

The economic vitality of the United States has always been deeply rooted in innovation. The country was built on a pioneering spirit that gave birth to inventors who developed the light bulb and cures for diseases; who built railroads and led the world into the age of flight; and who have more recently transformed business and communications through the power of information technology (IT).

As we and other countries around the world continue to struggle with the effects of a severe global recession, it is clear that economic recovery will depend on a robust innovative and entrepreneurial environment – one that incentivizes research and development (R&D) in new technologies, and provides greater certainty for those taking innovations to the global marketplace.

Without clear and consistent intellectual property (IP) protection, any invention – no matter how novel, or groundbreaking – can effectively be appropriated and thereby become a royalty-free donation to competitors. In today's globalized economy, promoting balanced patent protection and enforcement will help stimulate the type of jobs and growth that support efforts to improve living standards and achieve environmental sustainability.

That is why the USPTO is making great strides to optimize the innovation environment, ensuring that technologies spur growth, market competition is balanced and creative genius protected.

Re-engineering systems

The vision of a simplified and streamlined process for acquiring IP rights began with an overhaul of the antiquated "count system," for measuring patent examiners' performance. By convening a joint labor and management task force, the USPTO created a new system of incentives that affords examiners more time to review applications before issuing first-actions. The re-engineered system also established new channels of communication with patent applicants, encouraging an open dialogue about applications that boosts the efficiency and quality of the review process.

The office then established a three-track examination program allowing applicants to determine the pace at which their ideas are reviewed. A company in urgent need of IP protection can opt for an accelerated review for a fee, and for ideas that require longer incubation a slower track is available.

This program gives the innovation community the tools to tier priorities and help manage the patent backlog.



Photo: USPTO/David Smider

David J. Kappos, United States Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office (USPTO).

While recent budget decisions have hampered the rolling out of the Track 1 program as early as planned, all available structural and procedural resources are being put in place to offer it to the public as soon as budgets permit.

Irrespective of these challenges, the program reflects the USPTO's view that we live in an age in which technological change can affect businesses in an instant.

The onus is to create a smart, agile and enforceable patent and trademark architecture that can adapt to evolving business needs and leverage modern tools to address them. As the technologies the USPTO confronts become more complex, the IT systems that support its work must become more capable.

Adjusting to changing realities

Historically, when innovative products and services were introduced to society, it was fairly easy to conceive of them as stand-alone tools specific to a market, niche



or industry. Vaccines were largely biological, engineering devices largely mechanical and telecommunications products largely electronic. As we continue to seed new ideas, and as industries continue to leverage cutting-edge discoveries in the basic sciences, it is clear that the next generation of innovation will be cross-disciplinary. Great new products have one foot in bioscience, another in software, and yet another in nano-tech. These kinetic realities demand intelligent engagement and a smarter infrastructure to keep up. Ensuring generation-changing ideas can reach markets quickly requires 21st century IT systems. Acknowledging that urgency, the USPTO is enhancing its IT capability.

Last year we received around 35,000 petitions for patent operations. Many thousands waited for months until USPTO staff could process them. That has changed with the recent introduction of a web-based, fully automated system enabling instant – grants in many petition categories. The new system offers fast service, moves requests along in seconds – and makes better use of patent examiners' time by allowing them to focus on higher value work.

Developing a better IT system for the office also requires equipping stakeholders with the tools and information to make everyone's lives easier. That means optimizing the speed and accuracy of search tools and establishing a community wiki to enable office staff, practitioners and applicants to share, update and retrieve the information they need. As the *Manual of Patent Examining Procedure* and the *Trademark Manual of Examination Procedure* are the blueprints for interacting with the patent office, we have streamlined them and the way updates covering changes to the law are made and shared with users.

We are pleased to see that WIPO is testing E-PCT, a new secure online PCT file access system which allows applicants to view their PCT file on screen, to upload and download information and correspond with the International Bureau in a secure way.

Ultimately, we are striving for a 21st century IP system that is smarter, better, faster and stronger for all stakeholders – and one that relieves current stresses.

Automated searches, pre-exam screening portals, an automated workflow for all business transactions, more dynamic image searches and friendlier usability: these ongoing IT projects are components of an office that is

serious about modern innovation. The USPTO is committed to building a nuanced IT ecosystem that serves as a springboard to stronger patents.

Piloting Peer-to-Patent

That is why, when tackling issues surrounding the quality of patent examination, we are also harnessing the Internet to improve the patent examination process through the second Peer-to-Patent (P2P) pilot program.

By giving members of the public the opportunity to submit relevant prior art, the scope of examination is widened and the quality of review heightened. Shortly after launching the first pilot, the site, hosted by the New York Law School, received thousands of hits and nearly a thousand pieces of prior art were submitted. Before long, patent offices in other countries followed suit initiating their own peer-to-patent pilot programs.

To harness this momentum, the USPTO launched a second pilot in October 2010, inviting patent applicants in the life sciences and telecommunications fields to participate. In the first six months alone, over 200 applications were received, exceeding the total number netted in the first two-year pilot, and the office is on its way to possibly doubling or even tripling this figure. Presently, we are seeking to broaden participation and scale up the program to create an environment conducive to open-sourced, third party submissions, across all platforms.

While the aim is to heighten the quality of patent examination, we must also grapple with the unfortunate reality that current pendency rates mean thousands of ideas and jobs are lying in wait on the sidelines. Adding to that conundrum, in the past 50 years there have been more technological advancements than in any previous period in history, but with no significant patent reform to keep pace.

Sweeping reforms

In this new century, tomorrow's economy cannot be expected to take root in yesterday's infrastructure.

This is why President Obama, Secretary of Commerce Gary Locke and I have been working to build widespread support for comprehensive patent reform, which is now under consideration in Congress.

This patent legislation would enhance the U.S. patent system by offering greater certainty about patent rights, as well as alternatives to expensive litigation when patent rights are disputed. Ultimately, the bill will provide the most sweeping reforms to the U.S. patent system in 60 years – and even, arguably, in 150 years.

Having passed the U.S. Senate with overwhelming support, 95 to 5, and the House Judiciary Committee by a vote of 32 to 3, the proposed reform balances IP rights and makes the USPTO a catalyst for growth. By establishing a First Inventor to File system, patent rights are granted with greater speed and certainty. A more streamlined structure for post-grant challenges will offer fast and cost-effective alternatives to protracted litigation, reducing barriers to growth for small and medium-sized businesses and spurring innovation and jobs.

Through this legislation, the patent office can retain the fees necessary to ensure high quality and timely patent reviews. This is particularly crucial in a world in which economic outcomes truly do turn on the quality and efficiency with which a patent application is reviewed. Adequate resources ultimately make the difference between an effective USPTO that turns ideas into jobs – and one that does not. Passing this legislation would enable it to improve the quality of examinations without adding to the deficit, while also allowing the office to actually use applicants' fees to do the job it is paid to do in the first place.

In a globalized world, comprehensive patent reform will increase productivity by enabling greater cross-border work-sharing between the USPTO and other patent offices.

This modernized patent infrastructure also levels the playing field for independent inventors and small businesses seeking to participate in the global marketplace – thereby enhancing American competitiveness. To this end, we have embarked on a lively conversation with key trading partners, developing nations and overseas patent offices about ways to harmonize substantive patent norms, to ensure the global patent system accelerates global commercial activity rather than impeding it, as can currently be the case.

But it is also important to clarify that U.S. patent reform is neither about politics nor about imposing one country's standards on those of others; instead, it aims to ensure

the country is doing all it can to create a more efficient IP system, support business, spur economic growth and innovate for the future.

In this pursuit, the goals of patent quality and patent pendency ought not to be seen as mutually exclusive. Reducing the backlog frees up resources for enhancing the scope of patent examination, and for making application review more robust, thereby ensuring the best technologies are available to serve society at large. The package of initiatives and reforms the USPTO is implementing holds both of these goals in high regard and, through collaborative discussion with patent offices around the world, everyone can work to foster tomorrow's innovation while offsetting the stresses currently affecting the global IP architecture.

Expedited review for green technologies

Sustaining innovative solutions for tomorrow also means focusing on technologies that can address energy concerns for generations to come. That is why the USPTO is proud to help accelerate socially conscious technologies. Under its Green Technology Pilot Program, the review of patent applications involving reduced greenhouse gas emissions, enhanced energy conservation and environmental quality is expedited – at no increased cost to the inventor.

By committing to build a more sustainable energy future, the USPTO seeks to spur innovation and promote green collar jobs that provide the world with alternatives to harmful energy practices.

Government investment in the building blocks of innovation through new infrastructure and research can help to establish an environment ripe for private sector investment and competitive markets in this groundbreaking area.

Enhanced R&D investment, public-private partnerships, and cause-based technologies are essential to 21st century business, and the U.S. Department of Commerce and USPTO are paving the way by creating 21st century business opportunities in the country.



COPYRIGHT COMPLIANCE IN PRIVATE COMPANIES:

Challenges & Solutions

“This is a great article. I have to share it with the R&D department.”

“Our sales will dramatically increase when we post this product review on our website.”

“I grabbed these free photos off the web. Maybe I should email them to our Australian office so they can include them in marketing materials.”

“I like to access the corporate intranet on my tablet to read daily press coverage.”

“It would be great if chapter three of this eBook could be used in the next training course for our financial team.”

These are just some of the ways people use and share published information in companies today. Collaboration is essential in modern, efficient organizations, and digital sharing of copyright-protected content is one of its major components. In this article, **Victoriano Colodrón**, Executive Director of RightsDirect, discusses the copyright compliance challenges businesses face as well as effective solutions to these challenges.

In the United States alone, 75 percent of employees surveyed by research firm Outsell in 2010 said they share content with team members every week, and in many cases, daily. Workers around the world are increasingly sharing information, particularly online content. A 2011

FreePint survey revealed that more than 40 percent of workers worldwide forward web content at least weekly.

The use of copyrighted works – in particular text and image-based works – is intensive and pervasive in most companies, and not only those with a strong research component. Employees need to use and share valuable information from print and digital sources for everything from research, marketing and public relations to training and product management. In today’s fast-paced, global working environment, employees increasingly rely on timely access to information in order to innovate, collaborate and stay ahead of the competition.

Organizations use many different types of content, including scientific and technical information, financial, legal and business information, statistics, news, graphs and photographs and other images. Employees may obtain this information from a variety of sources including scientific, technical and trade journals, books, magazines, newspapers, websites and blogs. Access is typically gained through subscriptions with publishers or agencies, from document delivery and press-clipping agencies, and from corporate intranets and the Internet.

Dealing with copyright compliance

What do employees need to do when they want to share a scientific article, a blog post, a photograph or statistical information? How can they find out whether specific content is copyright-protected or who the copyright owner is? Whom should they contact in their company if they have doubts about copyright protection or to secure the necessary permissions?

While employee copyright awareness is higher than even five years ago, studies show that most workers still lack sufficient awareness of their responsibilities under intellectual property (IP) laws, particularly when it comes to sharing digital content. Many believe that content available on the Internet can be shared without requesting permission. They either assume they can forward articles from journals they subscribe to, or they are unaware of whether – or how to – clear the necessary rights. The Outsell study revealed that 54 percent of knowledge workers surveyed either do not think about the need to obtain copyright

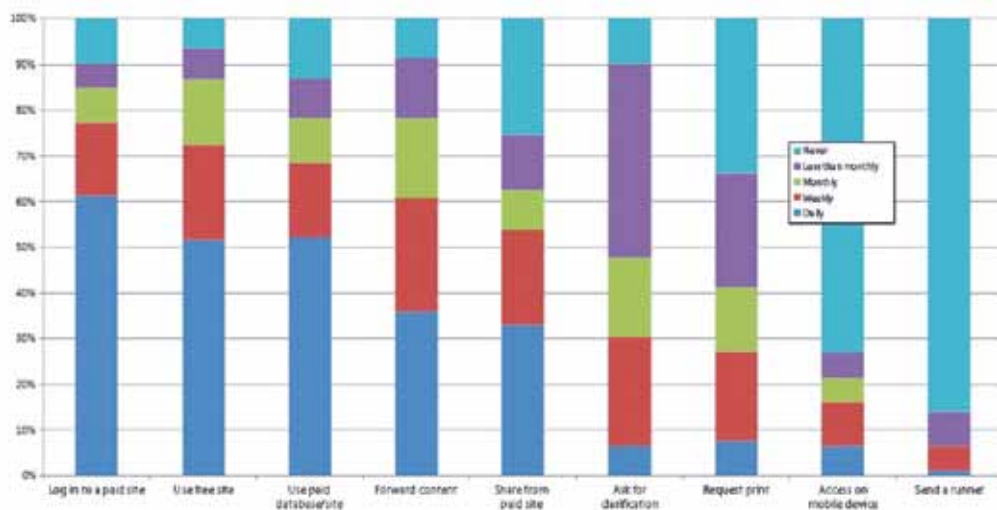


Fig. 20: Spread of responses

permission when forwarding information, or are simply ambivalent.

The combination of low copyright awareness with fast and easy ways to access and share information has created one of the most important challenges facing companies today – copyright risk management. Low awareness can result in confusion, for example, about the exceptions and limitations to exclusive rights established in national copyright laws. These exceptions and limitations typically do not cover acts of exploitation by private companies for business purposes. This lack of awareness and understanding is especially apparent in companies with no specific copyright policy or no copyright compliance officer. Instituting a copyright policy and appointing, training and empowering someone to be responsible for copyright compliance matters can be a tall order for many businesses.

Even companies that try their best to protect the IP of third parties can experience difficulties in obtaining the necessary permissions for employees to share content legally. Obtaining permission from copyright holders can be a cumbersome and time-consuming process, especially if efficient, flexible licensing sources are not used. Businesses need to identify the works to be used, locate the relevant right owners or licensing agencies and, finally, acquire the rights. This entails time and money. Given the potentially thousands of different individual right holders from whom to obtain authorization, the multiple types of information, licensing and invoicing procedures involved, and the varying response times and levels of service, the scale of the challenge is enormous.

In many cases, obtaining the necessary authorization means interrupting business workflows and delaying

the dissemination of information. Corporate researchers who need to share scientific articles online with their colleagues require authorization mechanisms that are quick and easy to use. In an ideal world, these researchers would have a license that pre-authorizes this type of content use.

For multinational corporations, having employees in different countries can further complicate copyright compliance, because IP rights are territorial in nature. A license that allows employees to share material across borders is therefore crucial. Subtle nuances in national copyright laws may have significant implications for business practices where copyrighted materials are concerned. In many cases, multinational corporations struggle to obtain uniform, global permissions, and instead have to deal with licensing agreements restricted to specific countries or groups of countries, offering different sets of rights for different territories and operated by organizations with diverging licensing and pricing mechanisms. As FreePint highlights in its 2011 report, “knowledge workers often assume that their internal subscriptions to databases and premium resources enable global access, which is not always the case based on the actual license agreement with the vendor.”

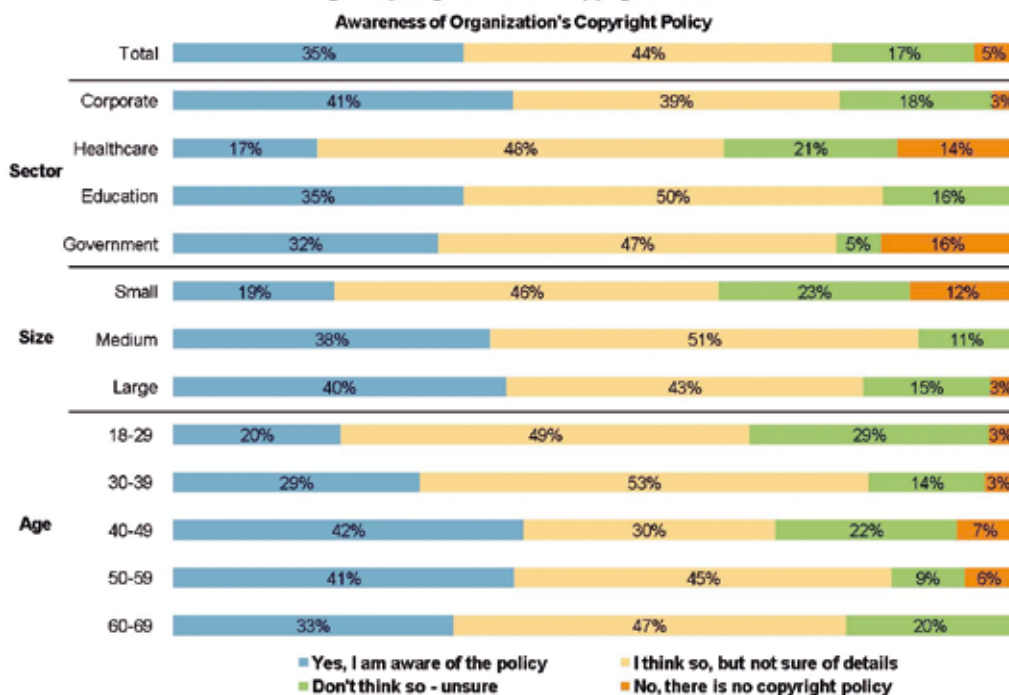
Compliance solutions

The good news is that there are solutions to these challenges. The “copyright compliance toolkit” at the disposal of private firms can be summarized in three key concepts: education, information and efficient licensing mechanisms.

Businesses around the world that understand the value of respecting copyright, as well as the financial and reputational risks involved in copyright infringement, ensure their



Figure 13. Organizational Copyright Policies



Bases = Total: 237; Corp=116; Healthcare=29; Edu=58; Gov=19; Small=57; Medium=53; Large=106;
 18 to 29=35; 30 to 39=58; 40 to 49=60; 50 to 59=69; 60 to 69=15
 Source: Outsell's Copyright Survey, 2009 (Q18)
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employees receive sufficient, appropriate and ongoing education on these matters. Whether through in-house training or training provided by external experts, it is important that courses be tailored to internal audiences. A broader, more committed approach to copyright education should also include a corporate copyright policy, as well as the appointment of a copyright compliance officer to ensure company-wide adherence to copyright procedures.

1. www.copyright.com

Licensing is perhaps the most important element of a successful copyright compliance strategy. Businesses have two main ways of clearing rights to use copyright-protected content: they can either obtain permission directly from each right holder or collectively from many different right holders via a single collective licensing broker. Collective licensing allows companies to simplify the permissions process by securing the required rights from one source. This can be done on a per use basis, or through a blanket or repertory type of license which is more popular among businesses.

While it is important for businesses to respect IP rights, it is also critical that copyright holders and their representatives provide licensing services that are easy to use and well adapted to the needs of corporate users. When the use of content is widespread involving thousands of information sources and right holders, licenses that aggregate relevant rights prove to be a cost-effective

solution. With this method, permissions are pre-cleared and available whenever the need to share the content arises, thus minimizing the risks of copyright infringement.

It is this kind of license that reproduction rights organizations offer to domestic corporate markets. Copyright Clearance Center (CCC) and its European subsidiary, RightsDirect, for example, provide a license that gives corporations the right to share content belonging to thousands of different copyright holders. Employees are granted a consistent set of rights for sharing information with co-workers in multiple territories. CCC and RightsDirect also offer free resources¹ to help companies develop copyright policies of their own and to educate staff about copyright law.

Businesses thrive through collaboration and the exchange of knowledge, and this requires access to copyright-protected information. Clearing the rights to use this information can place a heavy burden on businesses. Fortunately there are simple and effective licensing solutions that enable companies to successfully rise to the copyright compliance challenge.

DESIGNING THE FUTURE CELEBRATING THE PAST

This year marks the 150th anniversary of the grant of New Zealand's first patent. NZ Patent No. 1, for a plant fiber dressing process and leaf-stripping machine used to manufacture rope and woven fabric, was granted to flax milling business partners, Arthur Guyon Purchas and James Ninnis in 1861.

Special legislation – the Purchas and Ninnis Flax Patent Act, 1860 – was introduced to enable the Governor to grant the patent. The specification, entitled “An invention for the preparation of the fiber of *Phorium tenax* and other plants for manufacturing purposes”, was deposited at the Colonial Secretary's Office in Auckland, New Zealand on October 10, 1860, and the Letters Patent were subsequently issued on March 26, 1861.

International recognition came when both inventors were awarded a medal for flax fiber prepared using their New Zealand patented process at the London World Exposition of 1862.

Flax mill operations

Purchas and Ninnis built a mill on the Waitangi stream in the North Island where leaves were stripped by grooved iron beating plates. Stream water circulated by the mill

wheel removed plant waste. They produced 90 tons of native swamp flax fiber using the patented process before the mill was closed for a time when fighting broke out between the colonial settlers and Waikato Māori. Ninnis then moved to Kaiapoi in New Zealand's South Island to set up milling operations there.

Photo: 7-A2820 (circa. 1860) St. George Grey Special Collections, Auckland Libraries



The Waitangi Mill where the flax stripping invention was installed, for which New Zealand's first ever patent was granted

The men behind the patent

Dr. Arthur Guyon Purchas (1821-1906)

Arthur Purchas, a doctor, clergyman and musician with wide-ranging interests sailed to New Zealand from England in 1846. After serving the Parish of St. Peter's Onehunga for some 28 years, in 1875 he resumed medical practice. A respected member of the Auckland province colonial community, he learned the Māori language and helped foster respect and understanding between the local Māori and colonists. As musical director for the New Zealand Anglican Diocese, he produced two national hymnals, including some of his own works with English and Māori lyrics. After retiring as a vicar, he continued to teach music to the blind and even invented a speedy method for preparing metal plates to print Braille.

Captain James Ninnis (1809 – 1879)

An English mining engineer, Captain Ninnis went to New Zealand to run the copper mine on Kawau Island in 1844. When his contract expired, he managed the copper mine on Great Barrier Island until it was abandoned by the mining company in 1851. The Ninnis family then settled in Onehunga where, in 1860, the favorable business partnership between Purchas and Ninnis began. Captain Ninnis is credited with designing the machinery driven by the water wheel at the Waitangi Mill and setting up a second flax mill at Kaiapoi.



On July 11, 1866, the *Timaru Herald* reported that 47 bales of dressed flax manufactured under the Purchas and Ninnis patented process had sold for NZ£37 per ton. It is not known how long the Purchas and Ninnis flax mill operations lasted, or how profitable they were.

Early government support

Processing flax to extract its natural fiber was a labor-intensive process. Dressing flax by hand involved using mussel shells to strip away fiber from the upper leaf surface. Mechanical strippers produced a coarser fiber extracted from the whole leaf. One machine could produce 250 kg of fiber in the time it took a skilled Māori contracted worker to yield just 1 kg.

New Zealand flax fiber competed well with other imported manila rope¹ and jute materials in Australia, Great Britain and North America. A small quantity of dressed flax was processed in New Zealand and sold as spun cordage or industrial strength woven fabric for tarpaulins and bales.

The New Zealand government was keen to encourage innovation and enterprise by granting patents for new inventions and offering export and manufacturing incentives for thriving local industries. By 1870, ten years after the granting of that first patent, there were 161 flax mills with 1,766 workers – most were located near flax swamps and employed between 20 and 30 ‘flaxies’.

Foxton flax stripping museum

Foxton is the only museum in the world with a working flax stripping machine. The dressed swamp flax processed by the museum is still supplied to furniture makers and used for packing and Māori crafts.

Designing the future

Harakeke (swamp flax) remains an important sustainable natural resource. Research and development continues to focus on fiber extraction technology, biocomposite textile and plastics manufacture, biofuel production, and breeding of new harakeke plant varieties.

Harakeke oil is rich in omega 3, 6 and 9 unsaturated fatty acids. Cold press extracted, the oil is mainly used in health food products, hypoallergenic soaps and cosmetics. Both the oil and seeds are used for animal feed and have potential for high-grade biofuel production.

Harakeke gel is used by the cosmetic industry as a skin-care ingredient. It is harvested from the base of cut leaf blades and has been shown to increase skin collagen and elastin levels within 48 hours of application.

Harakeke plants are tough, frost-hardy and grow well in a wide range of climates. Florists and gardeners value these clumping perennials for their long-lasting and flexible sword-like leaves and dramatic, bird-attracting, nectar-filled flower spikes. Plant breeders continue to produce ornamental cultivars in an extraordinary range of green, bronze and yellow leaf hues.

The harakeke plant

New Zealanders take pride in preserving and improving



Photo: iStockphoto/Lazing Bee

traditional flax weaving methods. Māori weaving can be distinguished by technique and purpose. These techniques and their products include *raranga* (plaiting/weaving), *whatu* (twining), *whiri* (cordage plaiting) and *tukutuku* (woven decorative house panels). Woven flax can be decorated with short lengths of dyed twisted *muka* (fine flax fiber), feathers and shells – especially *paua* (New Zealand abalone). Contemporary weavers mix natural and synthetic materials and use traditional and new weaving techniques to create new woven fabrics, *tāniko* decorative borders and products.

The National New Zealand Flax collection

Landcare Research, one of the New Zealand Crown Research Institutes, maintains a collection of 50 harakeke plants selected for their muka or raranga qualities. Harakeke samples are distributed on request to marae, schools, weavers and community groups wishing to establish a weaving resource.



Dual thread rope making bobbins

Piupu (flax skirt) featuring a *tāniko* extending down behind the individual pokinikini

1. Manila rope is a type of rope made from fibers obtained from the leaves of the abaca (*Musa textilis*), a species of banana native to the Philippines. The name refers to the capital of the Philippines, one of the main producers of abaca.

IN THE NEWS

Denmark & China named top green-tech producers

Denmark was named the world's top green technology producer in a recent report commissioned by the World Wide Fund for Nature (WWF) according to a report by the Associated Press. Denmark earns some US\$9.4 billion – 3.1 percent of its gross domestic product (GDP) – from renewable energy technologies and energy efficiency. Growth of green technologies in China, however, outstripped the performance of other countries with a re-

markable 77 percent annual growth rate, according to WWF. China is the largest producer of green technologies in monetary terms, with earnings of some US\$64 billion or 1.4 percent of GDP. Germany, Brazil and Lithuania are also among the top five clean-tech producers in terms of percentage of GDP, after Denmark and China. The report was compiled by Roland Berger Strategy Consultants (Germany). ■

Paper-thin smartphone debuts

Researchers have recently unveiled a prototype, interactive paper-thin smartphone that can do everything bulkier smartphones can – make and take calls, send messages, store books and play music – according to a recent BBC News report. The flexible PaperPhone is made of electronic paper which, when bent, folded and flexed at its corners or sides, triggers different functions or features. "This is the future. Everything is going to look and feel like this within five years," said one of its creators, Dr. Roel Vertegaal. "This computer looks, feels and operates like a small sheet of interactive paper" he said; "you interact with it by bending it into a cell phone, flipping the corner to turn pages, or writing on it with a pen."

Photo: Queen's University, Canada



The PaperPhone's display, just millimeters thick, consists of a 9.5 cm diagonal thin-film, flexible E-ink display. Larger versions of these computers promise to eliminate the need for paper and printers. "The paperless office is here," said Dr. Vertegaal in a statement; "everything can be stored digitally and you can place these computers on top of each other just like a stack of paper."

The new appliance was created by a team of researchers from The Human Media Lab at Queen's University, Canada and the Motivational Environments Research Group at Arizona State University in the U.S. The inventors of this super lightweight device are seeking international patent protection for it using WIPO's Patent Cooperation Treaty (WO/2011/005318). ■

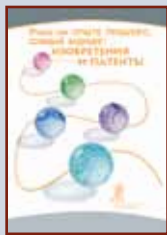
African parliamentarians focus on science

In early May, Africa Online News reported the launch of the African Inter-Parliamentary Forum on Science, Technology and Innovation (AIPF-STI). An initiative by African parliamentarians, the Forum seeks to give science, technology and innovation a more central role in

policymaking across the continent. Membership of the Forum includes all national African parliaments, the Pan-African Parliament and all regional parliamentary assemblies. According to Ms. Opoku-Mensa of the UN Economic Commission for Africa (UNECA), the move by parlia-

mentarians to stimulate interest in STI "will help push its agenda within their governments so it gets due attention". The aim is to help improve research and development structures across the continent to address Africa's development challenges. ■

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