

The role of IP in promoting economic growth through innovation

It has never been more important to foster the creation and exploitation of intellectual property rights. They will play a vital role in helping the world through the current downturn

By Ronald Zink

In these difficult economic times, companies and governments increasingly are looking to information and communications technologies (ICT), green technologies and other innovative goods and services to keep their economies productive and competitive. All of these industries, of course, rely on intellectual property protection – patents, copyrights, trademarks and similar rights – to fund research, generate returns on investment and continue the cycle of innovation and creativity.

British Prime Minister Gordon Brown's 27th February speech trumpeted the importance of innovation and IP as a tonic for the economy: "[I]t is vital that our portfolio of early-stage, high-value businesses survive the downturn to secure our long-term future competitive advantage. [W]e must act so we do not lose the value which has been created in the ideas and intellectual property arising from the sustained investment in research over the past 10 years."

Just a day earlier, India's Minister of Commerce and Industry Shri Kamal Nath had mentioned the country's 2005 Patents Act amendments in a list of steps taken to "give a fresh impetus to India's trade and growth story".

It is therefore timely to review the many ways in which intellectual property and the innovation that IP supports promote economic growth and competitiveness. This

article summarises a number of studies, statistics and industry developments of the past few years as to how IP promotes healthy economic activity, including benefits to the companies engaged in innovation, benefits to the wider economy, benefits to collaboration and benefits for public research.

Benefits to companies: turning R&D into business assets

Intellectual property is a "power tool" for economic development", as the Director General of the World Intellectual Property Organization (WIPO) Kamil Idris put it in 2002. "[I]nternational acceptance and utilisation of IP tools means that there will be more innovation and therefore more creative change and cultural and economic growth."

The way this works generally is that IP provides a negotiable currency of rights in inventions, works and other intangible representations of products of the mind. Governments award this intellectual currency to inventive and creative companies and individuals if their inventions and creations meet the criteria for protection established in the IP laws. In a healthy IP system, the value of the IP's currency is determined by the market. It is reflected in the levels of sales of IP-based products and services, the prices at which rights in these IP-based items can be sold or licensed and the market values of the companies that own the IP.

This intellectual currency in intangible inventions and works has vital importance in a modern economy. As the *Economist* put it in October 2005: "[I]deas and innovations have become the most important resource, replacing land, energy and raw materials. As much as three-quarters of the value of publicly traded companies in America comes from intangible assets, up from around 40% in the early 1980s. The

economic product of the United States, [said] Alan Greenspan, the [former] chairman of America's Federal Reserve, has become predominantly conceptual. Intellectual property forms part of those conceptual assets."

There have been some interesting studies showing specifically how the IP system works to provide incentives and rewards for those companies that use the system to turn innovative research and development (R&D) into business assets.

Inventions are worth more if they are patented

Professor Arora and colleagues studied what they called the patent premium, finding that firms on average can expect to earn 50% more on an invention if it is patented rather than unpatented. They also found that the more valuable a patent, the more R&D that takes place: a 10% increase in this patent premium leads to a 6% increase in R&D expenditure by the patent holder (Arora et al, *R&D and the Patent Premium* (2003)).

Patents attract investment

Patents can be the key condition for start-up firms to get access to funding from investors such as venture capitalists. Once a start-up reaches a certain stage of development, the fact that it has turned its R&D into a patented asset signals good management and demonstrates that the firm has defined and carved out a market niche (Lemley, *Reconceiving Patents in the Age of Venture Capitalism* (2000); Kamiyara et al, *Valuation and Exploitation of Intellectual Property* (2006)).

Intellectual property increases the market value of the company that owns it

Research also has shown that companies

with larger patent and trademark portfolios have relatively higher share prices in the stock market (Greenhalgh & Rogers, *The Value of Innovation: The Interaction of Competition* (2006)). Similarly, IP accounts for a major portion of the intangibles reflected in companies' share value (its premium over tangible-asset value). A 2008 Interbrand/*Business Week* report showed that the value of the IP in the brand alone for each of the top 10 brands worldwide was more than US\$25 billion.

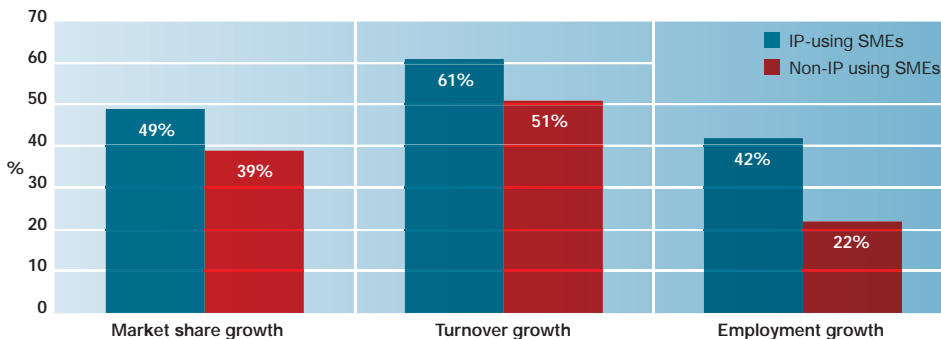
SMEs rely on intellectual property even more than larger companies

Two recent studies demonstrate that SMEs rely on IP protection and licensing as key elements of their strategy to protect their innovations from expropriation, gain a return from innovation and compete or partner with larger companies.

An extensive study carried out by IDC for the European Commission in 2008 found that 89% of SMEs in the ICT sector rely on one or more types of intellectual property and 4% more have plans to do so. SMEs that use IP rights experience greater growth in market share (49% of IPR-reliant firms versus 39% of firms without IP), growth in turnover (61% versus 51%) and growth in number of employees (42% versus 22%). SMEs reported that they primarily use IP to realise financial benefits from their new products and services, to foster collaboration and to gain access to funding (IDC, *Intellectual Property Rights and Competitiveness: Challenges for ICT-Producing SMEs* (2008)).

Professor Gambardella and his colleagues have found in similar research that small firms seem to rely on their patents even more than larger companies. Although SMEs typically have a smaller

The IP dividend



SMEs in the ICT sector that use intellectual property experience greater market share, turnover and employment growth

number of patents, small firms (<100 employees) on average report that they put 80% of their patents to industrial or commercial use, while large firms (>250) use slightly less than 60% of their patents. Similarly, smaller enterprises license 26% of their patented technologies, compared to 9% for large firms (Gambardella *et al*, *The Market for Patents in Europe* (2006); Gambardella *et al*, *The Value of Patents for Today's Economy and Society* (2005)).

Benefits to the economy more broadly
IP-dependent sectors make a significant contribution to the economy, create employment and generate tax revenues.

There are tremendous benefits to be realised in national and regional economies in those segments of the economy that rely on a healthy intellectual property system. The European Commission, for example, estimated that the content industries (covering print and online publications, music, film, software and other similar works) contributed more than €1,200 billion to the economy of the European Union, produced value added of €450 billion and contributed approximately 5.3% to the EU's GDP in 2000.

At the national level, the British government reports that more than 8% of UK GDP and 4% of its exports depend on the content industries. These industries are estimated to account for more than 6.5% of the GDP of the United States (Siwek, *Copyright Industries in the US Economy* (2006)). Entire industries and literally millions of employees depend on and benefit from intellectual property protection.

The software and broader information and communication technology (ICT) sectors in particular are heavily dependent on patents, copyrights, trade secrets and other intellectual property protections, and contribute greatly to economies all over the world. The software industry alone generates US\$1.7 trillion in annual economic activity, supports 1.1 million businesses, employs 11 million workers and pays US\$900 billion in taxes annually to governments worldwide (IDC/BSA 2005).

These benefits are not limited to

developed countries. Since India reformed its IP and other laws in the late 1990s, for example, its software and services industry has grown to be among the largest employers, directly employing more than 1.6 million people and indirectly creating employment opportunities for an additional 6 million people in related industries (NASSCOM 2007).

It is obvious that in many IP-based sectors, the employment created involves highly skilled, high value-added jobs. In the US, for example, the 2005 average annual compensation per worker was US\$69,839 across all core copyright industries and US\$66,727 among the total copyright industries (Siwek 2006).

The GDP, employment and other gains that the IP-dependent sectors produce for the economy are not limited to those sectors. Healthy IP-based industries also drive economic activity, employment and taxes in their related upstream and downstream markets. The software sector provides an excellent example. For every software publisher that develops and produces computer programs directly, there is a range of other upstream and downstream businesses related to that software. On the downstream side, this includes resellers of that particular software, resellers of other software that works with it, sellers of services for the software (installation, customisation, maintenance, etc), and sellers of other products required to use the software (computers, peripherals, etc). IDC estimates this multiplier effect to mean, for example, that for every euro that Microsoft makes in sales of Windows Vista, other companies make €13.30 in revenues from related software, hardware and services (IDC, *The Economic Impact of Microsoft Windows Vista* (2006)). This translates into additional employment and tax revenues in those upstream and downstream businesses – an effect relevant to other IP-dependent sectors as well.

The positive effect of the IP-dependent ICT sector reaches well beyond its upstream and downstream businesses to the economy more widely. A recent economic and policy study commissioned by the ICT industry

“Healthy IP-based industries also drive economic activity, employment and taxes in their related upstream and downstream markets”



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body CompTIA found that:

- ICT industries accounted for one-third to one-half of the total GDP growth experienced in the 1990s in 10 countries surveyed worldwide.
- A healthy ICT industry increases the GDP output of non-ICT sectors as well as its own.
- Economies with high levels of ICT use experience labour productivity that is seven times higher on average than productivity in countries with low ICT use.
- GDP and productivity growth accelerate as ICT use grows.
- ICT use produces widespread development benefits for society and daily life. These include benefits for education, healthcare, public safety and national defense, e-government and infrastructure, and poverty alleviation (Dixon, Sallstrom *et al*, *The Economic and Societal Benefits of ICT Use* (2007)).

It is small wonder that countries such as Singapore, India and China, and now nations such as Chile and Mexico, have seized the initiative and focused resources, education and other public policies (including IP protection) on promoting the software industry and other IP-dependent ICT-based sectors. Singapore began doing this 20 years ago and is now a world-renowned high-tech centre. India's software and services business revenue hit approximately US\$50 billion in 2008.

Benefits for open innovation and collaboration

Healthy IP protections promote disclosure and licensing of new technologies.

IP protection gives the participants in markets such as the ICT sector the freedom to share and license their technologies on terms that make commercial sense. The trend in this sector over the past few years has been away from using IP protection strictly as a means of preventing wholesale expropriation of one's own technologies and towards disclosing one's own technologies through such vehicles as patent applications, to grant licences to allow others to build on one's innovations and to take licences in return to improve one's own products.

The recent IDC report on IP use by SMEs in the ICT sector confirmed this trend: SMEs in the ICT sector reported that they use their patents more often to "foster collaboration" (46%) than simply to "block competitors" (32%). In Europe, meanwhile, 68% of senior executives in Europe told the *Economist* that "their top strategies for accelerating innovation over the next two years" are to increase patent licensing and other IP-enabled collaboration with outside firms (*Economist*, "The Value of Knowledge" (2007).)

This trend towards licensing and collaboration has been borne out in practice with respect to Microsoft's own technologies. In December 2003, the company announced that it was "open for business" to license a broad variety of its

Interoperability in action

technologies to all comers, on reasonable and non-discriminatory terms – in many cases for free. Microsoft has entered into more than 500 IP licensing agreements since 2003, including a stream of licences with companies such as Novell, JBoss, Xandros, XenSource Inc, Samsung, Zend Technologies Inc and others, for them to use proprietary Microsoft technology in their products. Microsoft is comfortable in licensing its technologies widely, and is protected against unauthorized expropriation and unjustified cloning that would unreasonably interfere with its own return on research and investments in the technologies it invents, precisely because of the safeguards provided by the IP system.

Healthy IP protections also promote interoperability

Interoperability is one specific example of how the IP system encourages greater collaboration and licensing of different companies’ innovative technologies among each other for the benefit of users. Interoperability is not a fixed or well-defined concept, but refers to different ways in which products and services can work better together.

With ICT interoperability in particular, IP’s so-called fence has become much more of a bridge than a barrier to collaboration between companies in recent years. This has certainly been the trend at Microsoft, which both licenses in interoperability technologies from numerous other vendors and offers to other companies what is probably the most extensive programme in the industry for licensing out its own interoperability technologies. This is why Microsoft’s software products work with such a vast number of computers, devices, services and other software products.

The ICT market is even seeing major collaboration projects between companies such as Microsoft and open-source companies to improve interoperability. In 2004, Microsoft and Sun Microsystems entered into a broad cooperation agreement to share technology and for Microsoft to support Java, which has developed among other things into Microsoft’s hosting a joint interoperability laboratory at its headquarters to improve interoperability with Sun’s products. Novell and Microsoft agreed in 2006 to collaborate to promote Linux and Windows interoperability.

In February 2008 Microsoft announced an even broader commitment to IP licensing in its Interoperability Principles, a set of broad-reaching changes to the company’s technology and business practices that will

increase the interoperability of its six high-volume software products. These principles include:

- Ensuring open connections to other software and device developers.
- Promoting data portability.
- Enhancing support for industry standards.
- Fostering more open engagement with the industry.

Underpinned by IP protection and market-based IP licensing, there is more inter-industry collaboration on ICT technology taking place than ever before.

Benefits for public research

Governments themselves have much to gain from the IP system as they fund research into new technologies in such fields as biotechnology, organic and industrial chemistry, informatics and vehicles, and general technology. The trend worldwide has been for governments to implement programmes for identifying patentable inventions that arise from publicly funded research, to secure patent protection for such inventions and to promote licensing and commercialisation of these inventions.

This trend began in the US with the Bayh-Dole Act, which entered into force in 1981. This gave academic institutions the right to retain IP rights in federally funded research, so long as they notify the funding agency, file patent applications, work actively to commercialise the invention and license the government to exercise the patent rights royalty-free. According to a Council on Government Relations report published in 1999, Bayh-Dole led to more than 8,000 US patents between 1993 and 1997 alone, the creation of 2,200 new companies, more than 1,000 new products and approximately 250,000 jobs and US\$30 billion in economic activity, based on technologies originally developed in academia with public funding.

Similar trends have been seen in the UK, Germany, Belgium and several other European and other countries that have adopted comparable laws. The share of public research institutions’ patent filings among total patent applications at the EPO jumped from about 0.5% in 1981 to nearly 4% per cent in the early 2000s.

Developing countries also see the benefit of identifying and protecting IP in academic research. Most recently, South Africa adopted its IP Rights from Publicly Financed Research and Development Bill in January 2009. Its stated reasons for identifying and protecting the IP arising

from publicly funded research, as set out in a press release from the country's Department of Science and Technology, summarise well the benefits for governments and the wider economy: "[Commercialising] intellectual property resulting from publicly financed research ... for the benefits of all South Africans"; providing "clear guidance on how to ensure that publicly financed IP gets out into the market place and is used"; "facilitating the creation of new knowledge that is derived from public funding"; and "driving South Africa towards a knowledge based economy in which the production and dissemination of knowledge leads to economic benefits".

IP's vital role in difficult times

The dynamics of the IP system of intellectual currency have economic and competitiveness benefits for businesses small and large, the wider economy and governments themselves. It should be no surprise, therefore, that in difficult economic times, government leaders are increasingly focused on the importance of

the IP system for driving innovation in new areas of technology, and protecting those innovations against expropriation.

While IP cannot cure all of the current economic ills, it certainly can play an important role: keeping the engine running for new ideas, products and services in widely diverse areas of technology; keeping these markets healthy; and fuelling much-needed employment, tax, productivity, GDP and other economic growth for the benefit of all. **iam**

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