Who Owns the World's Patents?

Why patent ownership data accuracy is a problem worth solving

- One in four records inaccurate
- $300 billion in untapped economic value

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> Knowing the facts of the matter about who alleges rights over patents is one of the absolutely essential components of what I would describe as the national information infrastructure."

SIR NIGEL SHADBOLT
CHAIRMAN AND CO-FOUNDER OF THE OPEN DATA INSTITUTE

> Ultimately, the marketplace works most effectively in an environment of transparency, allowing innovators to make smarter investments, create jobs, and drive economic growth. I would add that the economic benefits of greater ownership transparency are truly international in scope; the more awareness there is of the technologies out there, the more cross-licensing opportunities there are across borders[1]."

MICHELLE LEE
DIRECTOR OF THE US PATENT AND TRADEMARK OFFICE

Introduction

Who owns the world's patents? The answer is that no-one can be sure. This gives rise to an issue of significant economic importance. Innovation lies at the heart of technological progress, and patents sit at the epicentre of the global reward and recognition system. Without unambiguous ownership information, the full value of intellectual property – an emerging asset class - will not be realised.

This paper sets out to answer three questions:

1. How can it be that so much uncertainty surrounds so simple a fact as ownership of patents, where public disclosure is the bedrock to the existence of the right in the first place?

2. What are the consequences of this inaccuracy and uncertainty?

3. How can we ensure that patent ownership data is accurate in future?

It draws on original research, which gathered views from 96 senior corporate executives and intellectual property specialists, and on detailed interviews with experts across a range of relevant specialist areas – to explore these questions and give answers reflecting a range of perspectives.

Ultimately this paper seeks to answer the question "Is patent ownership data accuracy a problem worth solving?" In so doing, it seeks to quantify the benefits, and introduces a solution – the Open Register of Patent Ownership (ORoPO).

ORoPO is a not-for-profit open register of patent ownership information. It sets out to complement the work of Patent Offices worldwide, and has the support of patent owners and the financial markets.

> "ORoPO is a welcome development. It is a practical solution that addresses a fundamental issue, the accuracy and accessibility of data around patent ownership. Financial markets will not engage unless we have clear line of sight to ownership and title. To expect otherwise is simply to ignore history."
>
> **SCOTT BELL, HEAD OF UK INVESTMENT BANKING, DEUTSCHE BANK**

Context: IP on the rise

> "Increasingly IP rights are not only legal rights, but also economic assets. This is largely because this century many companies operating in knowledge-based economies are increasingly required to show to stakeholders that intellectual property is a core competence of economic activity."
>
> **YO TAKAGI, ASSISTANT DIRECTOR-GENERAL GLOBAL INFRASTRUCTURE SECTOR, WIPO**

In today's globally connected, increasingly knowledge-driven world economy, intellectual property is rapidly coming to the fore. Patents in particular are coming out of the shadows. Once seen as arcane legal instruments with little relevance to boardroom strategies, they have emerged as the assets that define enterprise value.

Intangibles like patents, it is said, now account for up to 70% of enterprise asset value, which is quite a turnaround from the situation a few short decades ago, when physical assets – real estate, plant, machinery and so on – enjoyed a similarly dominant position on the balance sheet.

Indeed, evidence of the increased importance of patents is not hard to find. Barely a day passes without patent related developments creating a stir in the media. Consider the column inches created by the endless smart phone wars, GoPro shares tumbling on the grant of a single Apple patent, Toyota announcing open access to its fuel cell patents.

Then there are the patent driven mega deals – for example, AOL selling and licensing a bundle of patents to Microsoft for $1.1 billion and Google buying Motorola Mobility for $12.5 billion then selling the business to Lenovo without the patents in June 2014 for $2.91 billion. There are literally thousands of other similar transactions, both large and small.

All of these developments have something in common, something crucial. They all strike at the very heart of corporate life, at the fundamentals of business – innovation, competitiveness – and they demonstrate that patents now play a defining role in a wide range of corporate transactions.

As Roger Burt, CEO of ORoPO (and former president of the Chartered Institute of Patent Agents) puts it, *"Patents are now assets of great interest to senior management and assets that are made to work. Equally, investors in companies, whether they are shareholders or they are perhaps equity funds, now want to see a company's assets used to the full, including its patents."*

A fundamental sticking point: patent ownership

> "Analysing a company's patent portfolio is so fraught with difficulty, you can't really trust the data. You don't know what company name patent rights are registered under, whether companies have changed names, whether a subsidiary has been sold off or new divisions have been purchased, or whether patent ownership data has been updated after a sale. It's a very uncertain area."
>
> **ROGER BURT, CEO, ORoPO**

Even as IP and patents are gaining such importance, there are dark clouds on the horizon – there is a fundamental sticking point that will become increasingly evident as the role of IP in corporate life becomes more and more important.

The most basic information about this emerging asset class, information as to ownership, is deeply uncertain and inaccurate.

Various estimates from very well informed sources – including an assessment made by Yo Takagi, an Assistant Director-General at WIPO, on the basis of WIPO's technical assistance projects, and David Kappos, former Undersecretary of Commerce for Intellectual Property and Director of the US Patent and Trademark Office – suggest that as much as 25% of the world's patent ownership data may be inaccurate.

78% of corporate executives surveyed think the information from public registers of patents is neither accurate nor reliable.

Given there are now around 20 million patents in the world, that means the patent registry data relating to ownership of around 5 million of them is inaccurate or just plain wrong.

To put that in context, imagine if ownership of 25% of a more tangible, everyday asset class was unknown; real estate for instance. At the very least that would prevent one in four real estate deals – from sales to debt security – from ever taking place.

More likely, it would make trade in an asset that pervades almost every aspect of the world economy impossible – certainty around ownership is a fundamental pre-requisite for properly functioning asset markets. This is a certainty that patents are yet to attain.

Clearly, then, given the growing importance of intellectual property, this is a situation that cannot be allowed to continue. Finding a solution, however, means first understanding the problem – exactly why is patent ownership data so unreliable?

An outdated system

> "The laws that govern patent ownership recordation were set out a long, long, long time ago before this information really did need to be updated as much as it does now. The stakes weren't as high as they are now, and there weren't as many different vehicles for moving and leveraging things like intangible assets as there are now."
>
> **DAVID KAPPOS, CRAVATH**
> **FORMER DIRECTOR OF THE US PATENT AND TRADEMARK OFFICE**

First and foremost let there be no doubt of the absolutely vital function that patent offices around the world perform. Their importance, and their efficacy in fulfilling their central remit, is not up for debate in this paper.

Rather, the overall regulatory, legal, procedural and infrastructural framework that surrounds them is no longer fit for purpose – it was simply never designed for the modern, interconnected and globalised world we inhabit today.

Indeed, if one were to design a system for recording patent ownership from the ground up now, hundreds of independent registers, each with its own protocols and systems would be near the bottom of the list of solutions.

In effect, however, that is what we have – an overall system that lacks integration and harmonised standards, and which offers no simple, centralised means by which to manage patent ownership records internationally.

As a result, opportunities to introduce error and inaccuracy into patent ownership data are many and varied.

Data entry

First of all, there are significant issues related to the accuracy of ownership data at the time of first registration – and for the most mundane of reasons, human error. It is surprisingly common to find patent registry data containing simple data entry errors – misspellings and company name format errors.

This is exacerbated when patent applications are paper based and key details must be transcribed onto the register by hand.

Translation

The nature of the international patent system is also a source of error and inaccuracy. A single patented invention may need to be registered with scores of different patent offices and in many different languages in order to provide global protection. Again, this is an obvious source of inconsistency and error, since patent owners may well rely on a huge network to translate and submit patent applications around the world.

Corporate identifiers

There is a compelling argument that 100% of patent ownership data is incorrect, simply because an internationally recognised, consistent naming convention for corporate entities does not exist.

This lack of centralised control over corporate identifiers has consequences. For instance, "CSR" is recorded as the owner of many patents in the world, including patents owned by a Bluetooth company in Cambridge, UK, a railway company in China and a mining company in Australia. This is a common case of three different companies having the same three-letter abbreviation, but sorting out the resultant mess is not help you receive from the patent registers.

Change of ownership

> "The cost of changing assignments for a patent portfolio across countries can quickly mount up to millions of pounds just in direct costs, never mind the administrative cost in agents' and managers' time. This is one of the reasons why reassignment is not notified."
>
> **TONY CLAYTON, FORMER CHIEF ECONOMIST, UKIPO**

Worse still, even if patent ownership data is correct at the time of filing, there is no guarantee it will remain accurate for the 20-year life of the patent. There are a great many things that can change patent ownership – mergers and acquisitions, patent sales, corporate name changes, and so on. Very commonly these corporate transactions should precipitate changes to relevant patent registry information – whether simply to reflect a change in name, or to record a transfer of ownership.

All too often, however, this simply does not happen – and this once again comes back, in the main, to inefficiencies in the system. The truth is that updating every patent register with the correct information is not a simple matter. There is no central mechanism via which to update them all in one fell swoop; they must all be updated separately – some electronically, some via postal submission and some in person. The time and cost involved – estimates range from £50 to £100 per patent, per registry – represent a significant disincentive to ensuring ownership is reassigned.

On top of that, there is very little in the way of legal requirement to ensure patent title transfer is recorded at the registry level. In most jurisdictions, ownership information must only be up to date when a patent owner wishes to litigate a patent.

The consequences for patent licensing and litigation

> "Inaccurate data in the system certainly does hurt patent owners, because those patent owners' transactions will not occur as efficiently as they otherwise might. Completing transactions takes longer and is more costly. Inaccurate ownership data is sand in the gears, sand that doesn't really need to be there."
>
> **MANNY SCHECTER, CHIEF PATENT COUNSEL, IBM**

These inaccuracies in the global patent record have significant and far-reaching consequences. The resulting inefficiencies, elevated costs and risk uncertainties create huge cost barriers to innovation, barring meaningful entry to all but the richest, most powerful corporates, depress the market for licensing transactions and increase the risk of litigation.

96% of corporate executives surveyed think it is important for there to be an accurate and accessible record of who owns which patents.

Licensing

> "The effects of patent ownership data inaccuracy on commercial transactions like licensing are huge. If you can't trust the data and you don't know who to talk to, where do you even begin?"
>
> **RICHARD JEFFERSON, FOUNDER & CEO, CAMBIA**

According to WIPO research[2], global cross-border patent licensing fees had reached a total of almost $200 billion in 2009 – having risen from a mere $2.8 billion in 1970, and $27 billion in 1990.

However it is likely that cross-border licensing represents only a relatively small proportion of all licensing revenue – for instance:

- According to a study by Yuichi Watanabe[3] patent licensing in the United States alone was around $150 billion per year in 2009.

- A study by the OECD and University of Tokyo[4] found that *"…64% of European companies doing licensing out license less than 20% of their (licensed) patents to entities located in a different country; 85% of Japanese companies doing licensing out license less than 20% of their patents to foreign affiliated companies."*

With this in mind, it is not unreasonable to arrive at the conclusion that total revenues from all patent licensing represent a market worth up to $500 billion worldwide.

All the same, if we assume that the ratio of cross-border licensing to all licensing activity is constant, WIPO's figures offer a useful view of overall market trends. By any standard, they tell a story of astonishing rates of growth – approximately 10% per annum in the period 1990-2009.

That does not, however, tell the whole story. A closer look at the figures allows an even more interesting picture to emerge. It is a story of rapid, almost exponential growth, starting in the mid-1980s, and continuing for almost 20 years – followed by a levelling off. Licensing revenue was showing signs of plateauing by 2001, and growth had undoubtedly stalled by 2009.

One possible conclusion here is that the market, in its current form, had reached its maximum capacity – that intrinsic features of the market were beginning to hold back further growth. This paper contends that those negative features are directly related to the inaccuracies in ownership data – and the costs, inefficiencies and uncertainties they create.

As Roger Burt put it, *"If you don't trust the register, why would you approach someone for a patent license? The true owner might be a friend, might be an enemy, or might be someone you are already in litigation with. Better data would enable more informed decisions but in the meantime, if you don't know, you have to assume the worst."*

By some estimates, these limiting effects are significant, with $500 billion global licensing revenues representing the small proportion of the potential market. Forrester Research analyst Navi Radjou, for instance, estimates that US firms alone "…annually waste $1 trillion in underused IP assets by failing to extract full value through partnerships[5]."

This also has significant implications for innovation in general, since the ability to determine patent ownership with confidence removes significant risk from the process of bringing new or improved products to market. Richard Jefferson explained, inaccurate and inaccessible patent ownership data inhibits innovation and creates barriers to market entry: *"Inaccurate data significantly increases the cost associated with de-risking innovation. We're talking about probably tens or hundreds of billions of dollars lost to what you could consider a 'tax' on innovation.*

"So the effect of not knowing who owns patents is very, very large indeed. It is also differential - because the resources necessary to determine ownership are so high, the SME doesn't even get into the game. That means that knowledgeable transacting only occurs in very large enterprises and even there at a very high cost. So, the overall tax on the innovation system by this lack of knowledge is almost unimaginably high."

Litigation

The lack of accurate patent ownership data also increases the frequency and cost of patent litigation. According to data from Lex Machina[6], the rate at which new patent infringement cases are filed in US District Courts is around three times higher now than it was in 2005 - a steep rise by almost any standards.

This rise in litigation, and the emergence of the non-practicing entities that have done so much to fuel this rise, is a hallmark of an inefficient licensing market. As Manny Schecter puts it, *"The lack of clarity around patent ownership fuels litigation because it makes it harder for potential licensees to find out who owns a patent, verify whether an appropriate license already exists, and if not, secure a license. This simply serves to increase the likelihood of conflict overall, and more often than not, conflict ends up in court."*

Importantly, patent ownership uncertainty also increases the cost of litigation, in two ways – both of which, in essence, take money away from patent owners and put it into the pockets of lawyers.

First, the process of finding out who owns a patent is more time consuming and involved, particularly if an invention is patented in multiple territories. Roger Burt explains: *"If you want to look at a company's portfolio, first of all you don't know what countries they've filed in, you have to make a guess at that. Then you have to start looking at the registers, so if you want to see what coverage they've got in Europe then you have to go to every single register."*

This discovery process is complicated further by the fact that some patentees are known to purposefully hide the true ownership of patents behind a thicket of shell companies.

6% The average amount by which corporate executives think patent licensing would increase if there was greater transparency and openness.

Secondly, more litigation clearly increases the overall cost to industry. For example, RPX estimates NPEs cost operating companies $12.8 billion in 2013[7]. This figure comprises legal and settlement or judgment costs related to NPE assertions and litigations. Multiply these numbers to take account of all litigation globally and you have a significant cost base.

The balance of payments

This paper contends that the overall market value of patents is a factor of the balance between patent licensing income and patent litigation costs. It contends that this gap, which was widening only a few short years ago, is now closing fast – as licensing revenue growth stalls and litigation continues to increase exponentially.

What seems clear, given the historic trend in licensing, is that a great deal more value could be realised, if inefficiencies and uncertainties in the system could be eliminated – by solving the problem of patent ownership data accuracy.

By removing risk and lowering the financial barriers to entry, this would encourage and enable greater market participation and, in turn, restart growth in global licensing. A further consequence of this would be to slow and potentially even reverse, the growth of patent litigation.

Economic impact

The net economic impact of this is potentially significant. First our survey found that, on average, corporate executives think an accurate record of patent ownership would increase global licensing income by 6%, which would provide patent holders with additional revenues of around $30 billion per annum[8].

However, the wider economic benefits – driven by the effect of increased licensing on innovation and in enabling wider market participation – could be far higher.

In a discussion paper published in 2005 and entitled *Schumpeterian Profits and the Alchemist Fallacy Revised*, Professor William D. Nordhaus concluded that "…a miniscule fraction of the social returns from technological advances over the 1948-2001 period was captured by producers..."

Professor Nordhaus analysed "both aggregate and industry data for the United States", and concluded that about 4% of the total economic value of innovation is captured by innovators. If one assumes that the situation for patents is in line with this average for all types of innovation, and one assumes that the returns to further diffusion of a patent via licensing are the same as the initial returns to an invention, then one can use this information to develop a global estimate of the returns to expanded licensing.

It follows from this that the total value of patent licensing as a contribution to GDP could be 25 times the revenues generated by the licensor[9].

We can apply this ratio to our projected $30 billion annual increase in patent licensing revenues, but with a caveat. Professor Nordhaus' calculations draw exclusively on US economic data over a period when the US was the world's dominant economic force, and over a time when innovation on an unprecedented scale led to the rapid emergence of entirely new market sectors, each generating many billions in annual revenues.

It would, therefore, be imprudent to suggest with certainty that the same 25:1 multiplier effect is universally applicable to patent licensing today. For that reason, we use a more conservative figure to develop a working estimate of the potential gain: a ratio of 10:1. Even though this may understate the overall economic impact, it still suggests that increased licensing worth $30 billion would deliver wider economic benefits of around $300 billion annually.

$300 billion

The potential total economic benefit of a 6% increase in patent licensing - enabled by ownership data openness.

The solution: Patience or open data?

The need to resolve the many issues associated with patent ownership data is, therefore, pressing.

At the most fundamental level, a situation in which 25% of the assets that make up 70% of enterprise value cannot be accounted for is simply not acceptable.

As David Kappos explains: *"In essence, you've got a bit of a wild west problem, where you can't figure out who your neighbour is, where your neighbour is coming from or any of the things you'd like to be able to know in order to conduct your affairs in an orderly manner. The evolution of the marketplace is definitely hampered by a lack of transparency, which also reflects itself in legitimacy problems. If you can't know who owns things you have to wonder what kind of a system are we running here."*

The big question, however, is how to fix the issue. For some, it is a matter for national governments – and, ultimately, that is true. The issue with waiting for a government-led solution is related to the complexity of the problem – just how long are we prepared to wait for the hundreds of governments, and their patent offices, to agree to, and then implement a commonly agreed, central solution?

96% of corporate executives who expressed a view think that information about who owns which patents globally should be available free of charge.

Let's not forget, that solution would comprise two elements, neither of which are straightforward:

- The digitisation and harmonisation of all the world's patent registries, including the adoption of a single, universally accepted set of corporate identifier protocols. The logistics associated with organising a forum for discussion alone look practically insurmountable in any reasonable timeframe; the prospect of any practical progress towards the end goal seems vanishingly small.
- The passing of legislation mandating that patent ownership data be updated within a certain timeframe following title transfers. Even if the political will was in place, which is not universally true by any means, this is another long and difficult process.

Now remember that one of these measures without the other is not a solution. Only with both these measures in place can governments, regulators and patent offices resolve patent ownership data accuracy once and for all.

Fortunately, there is an alternative open data solution: ORoPO.

Open Register of Patent Ownership (ORoPO)

ORoPO is a very simple, highly efficient solution; a 'market self-help' solution that sidesteps the complexities and obstacles associated with government or regulatory approaches to accelerate efforts to resolve patent ownership data accuracy.

98% of corporate executives who expressed a view would be supportive of a free and open global register of patent owners which allows patent owners to verify ownership information.

Designed following extensive consultation and discussion with patent owners and the ecosystem that supports the filing, prosecution, maintenance and monetisation of patents, ORoPO is simple:

- It is an online repository of data relating to the ownership of patents. An open data solution
- It is accessible to all at no cost
- Participation in ORoPO is voluntary, and open to any company that owns a patent
- Participants simply upload details of patents they control into ORoPO
- Participants can easily update their records – once for all territories – as and when patent ownership changes
- Corporate naming complexities are solved by requiring that all patents are registered under the name of the ultimate holding company that controls them
- The more companies that participate, the more complete the register will become
- If ORoPO becomes widely accepted, there is significant potential for it to assist patent registries in validating entries in their own local registries

> "Better access to patent ownership data may well increase the number of patent purchases and licensing deals, simply by removing an obstacle to them. Ultimately that would be good news because it would encourage better exploitation of innovation, more money for patentees and more money for licensees. So, good news all round."
>
> **THE RT. HON. PROFESSOR SIR ROBIN JACOB**

Conclusion: A problem worth solving

> "The fact that patent data is messy should be no surprise. It is a characteristic of every dataset that has evolved from systems that have been in place for hundreds of years. The current unsatisfactory position is accident not design, and there are no long-term benefits for anyone trying to game the status quo. ORoPO is a major step forward and I hope patent owners capitalise on the opportunity it provides."
>
> **NIGEL SWYCHER, CEO, AISTEMOS**

It is very hard to envisage a credible argument against finding a solution to the many problems associated with patent ownership data.

First of all, the current situation is simply not sustainable. We cannot accept a situation in which the ownership of one in four of the world's patents is uncertain, opaque or hidden. Not only does this damage the credibility of the entire system, but it also points to a structural weakness at the heart of the knowledge economic model.

That is, if organisations cannot understand the context within which their own patents exist – by knowing who owns patents that are relevant and comparable to their own, and therefore those organisation's characteristics – how can they hope to properly evaluate, account for, manage and monetise these assets that account for up to 70% of their balance sheets?

Immediate benefits

Then there are the immediate benefits of finding a solution, which are compelling: Greater certainty eliminates risk, which encourages greater patent licensing market participation – from both licensors and potential licensees. In turn, greater licensing activity increases innovation, changes the demographics of innovation, and ultimately contributes significant economic value. This is borne out by our research:

- 95% of corporate executives surveyed thought greater data openness around patent ownership would increase licensing activity
- On average, they thought it would increase by around 6%
- Almost half (49%) thought licensing would increase by more than 6%

As pointed out in this paper, even a relatively modest increase in licensing of 6% could drive economic benefits of up to $300 billion per annum, globally.

The wider benefits are perhaps even more significant. That is, an accurate and accessible global register of patent ownership can play a key role in the evolution of intellectual property into a functioning asset class

– unlocking a trillion dollar global marketplace by enabling the financial and insurance markets to engage with intellectual property.

Quite simply, the role of ownership clarity here cannot be underestimated. It is a fundamental characteristic of every functioning asset class – market engagement is simply impossible without it.

Look at the size of the financial markets defined by physical property – corporate finance, commercial insurance and so on – and it is very easy to see just how significant markets based on intellectual property assets could be: But only if we can find a way to unlock the door and release all that trapped potential.

> "Access to good quality information on patent ownership is a key enabler of a dynamic IP marketplace. The ORoPO approach holds real promise for confidence building for IP traders and financiers alike."
>
> **ROSA WILKINSON, DIRECTOR OF INNOVATION, UKIPO**

The open data solution

ORoPO has much to commend it. It is simple, effective and immediate. It has the potential to address all of the issues holding back data accuracy but one – regulation – in one fell swoop, it can be implemented quickly and cost effectively and, perhaps most importantly, it has the support of industry.

According to our survey, 96% of corporates think it is important "for there to be an accurate and accessible record of who owns which patents", and that "information about who owns which patents globally should be available free of charge."

Perhaps most strikingly, of those who expressed a view (90%), an overwhelming majority (98%) would support "a free and open global register of patent owners which allows patent owners to verify ownership information."

In conclusion, achieving openness and transparency for patent ownership is a problem worth fixing and ORoPO is a simple and elegant solution, which enjoys the support of those it is designed to serve – the patent owners.

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Yo Takagi (Assistant Director-General, Global Infrastructure Sector, WIPO)

Rosa Wilkinson (Director of Innovation, United Kingdom Intellectual Property Office)

About the research

Unless stated otherwise, all statistics quoted in this report are drawn from an original survey polling views on patent ownership data accuracy and related issues. The survey was carried out online between 10 February 2015 and 25 March 2015 and collected responses from 96 corporate executives, 40% of whom were IP specialists.

About ORoPO Foundation, Inc.

ORoPO is assembling the first global database of who owns which patents. It is voluntary and open. The Open Register of Patent Ownership contains patent ownership information verified by companies committed to openness and transparency.

For more information, see www.oropo.net

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