

March 2020

Cipher Report on Portfolio Optimisation

Incorporating the findings of the “How Many Patents are
Enough?” survey conducted in collaboration with *IAM*



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Key findings

The Cipher Report on Portfolio Optimisation is the first global study specifically focussed on analysing the approaches taken to balancing patent portfolios in an economy where the impact of disruptive technologies has never been more important.

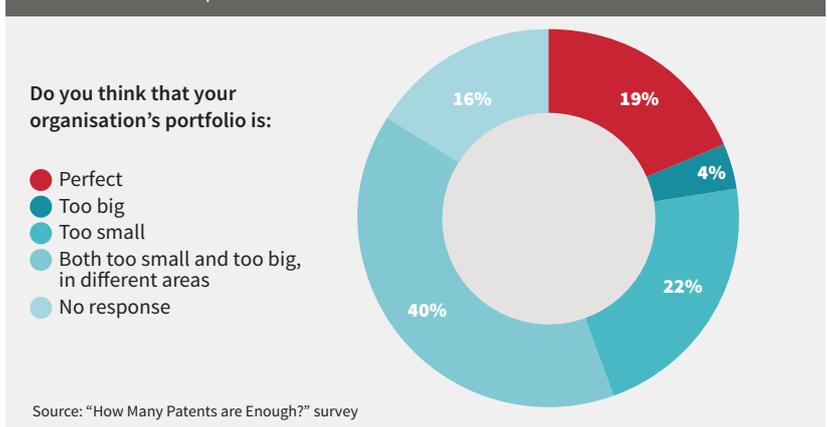
The key findings are as follows.

1. Over \$40 billion is spent on patents each year, but less than 20% of companies report that their portfolio is the right size

Portfolio optimisation is a challenge faced by all organisations which choose to protect their investment in technologies with patents. This is true irrespective of sector, geography or portfolio size.

Patents are one of the primary ways that companies protect their investment in technology. The challenge is to optimise patent protection for the technologies delivering the most value and to protect the organisation from competitive threats. What is valuable and who is a competitor changes all the time. It is hard for the teams tasked with policing the company's intangible assets, and specifically intellectual

FIGURE 1. Portfolio optimisation



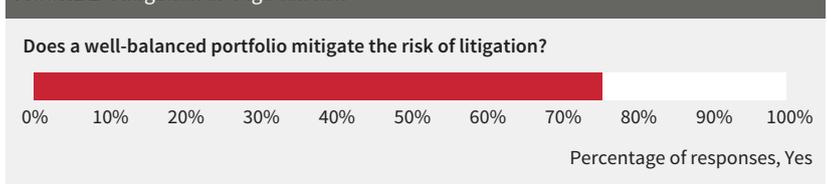
property, to keep up with the drivers of corporate strategies. The result is typically the overstocking of patents in some areas and understocking in others. This imbalance means that patents are failing to deliver full value for the money spent.

2. Most patent experts believe that a well-balanced portfolio reduces the threat of patent litigation

Over 75% of patent owners surveyed agree that a well-balanced patent portfolio reduces the risk of patent litigation. For the vast majority of companies, this is the most important strategic objective.

While patents confer the legal right to exclude others, the majority of patent owners regard the

FIGURE 2. Mitigation of litigation risk

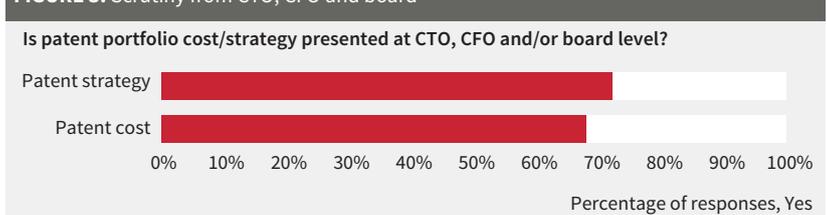


primary function of their patent portfolio to be defensive – namely, to neutralise the threat of litigation. With 76% of companies surveyed believing that a well-balanced portfolio reduces that risk, there is considerable focus on how best to achieve that balance.

3. Patent strategy is scrutinised by the CTO, CFO or board in most organisations

Companies across all sectors including industrials, automotive, technology and healthcare are being disrupted by new technologies, and increased attention is being given to both the strategic benefits and cost of building large patent portfolios, with around 70% of organisations reporting scrutiny at CTO, CFO or board level.

FIGURE 3. Scrutiny from CTO, CFO and board



It has long been the case that the CTO, CFO and others have accepted patent costs as necessary without understanding the strategic rationale for this investment. This has changed, with the vast majority of companies now presenting patent strategy outside the IP and legal teams.

4. Organisations spend an average of 9% of their patent budgets on strategic patent intelligence

While over 70% of patent budgets continue to be spent on new patents and maintenance of existing portfolios, on average 9% is being invested on analysis and modelling to communicate the strategic benefit of patent portfolios. This investment is entirely justifiable in an environment where,

on average, 4.5% of revenues can be exposed to third-party patent claims.

Strategic patent intelligence includes being able to evidence how your patent portfolio meets its strategic objectives. For those companies which use their patents to neutralise threats posed by others, this means having the ability to understand not only the relevance of the patent portfolio to the company's own technologies and products, but also how their portfolio maps to the products and technologies of those who pose patent risk. While this requires sophisticated modelling, this is justified by the significant risk to revenue posed by the proliferation of patents.

Recommendations

The Cipher Report on Portfolio Optimisation is a call to action. There are over one million patent-owning companies investing in aggregate over \$40 billion a year, and only 19% of organisations report that their portfolios are perfect.

The report identifies a broad range of strategic objectives served by patents and what the right size and shape is will differ depending on that context. For the majority, patents exist to neutralise threats and act as a deterrent, and for these organisations a well-balanced portfolio reduces patent risk.

Many organisations are facing scrutiny from senior executives across finance, technology and, in many cases, the board. Patent experts report that

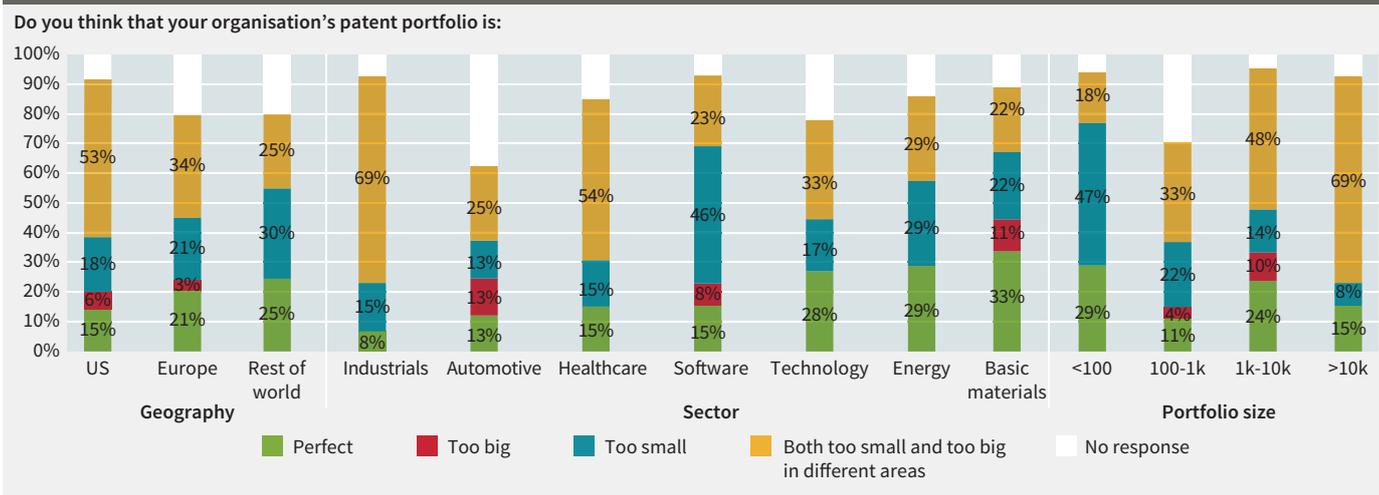
there is interest in both patent strategy as well as cost. Companies are now using sophisticated models to help optimise their portfolios, and the approaches discussed in this report suggest use of both patent and revenue data. Both the survey and the interviews on which the Cipher report are based suggest that companies should adopt optimisation models as a source of rational and repeatable metrics in an area that has, up to this point, been largely managed through experience and gut instinct.

As evidence-based approaches become more widely adopted, it will be interesting to monitor and measure whether more companies gain confidence over time that their portfolios are the right size.

Detailed findings

This section provides a more detailed analysis of the survey responses, and includes contributions from further interviews conducted with the survey respondents.

FIGURE 4. Too small, too big or perfect?



1. Over \$40 billion is spent on patents each year, but less than 20% of companies report that their portfolio is the right size

Portfolio optimisation is a challenge faced by all organisations which choose to protect their investment in technologies with patents. This is true irrespective of sector, geography or portfolio size.

Figure 4 analyses the survey responses grouped by size, industry and geography. The findings are different in each area:

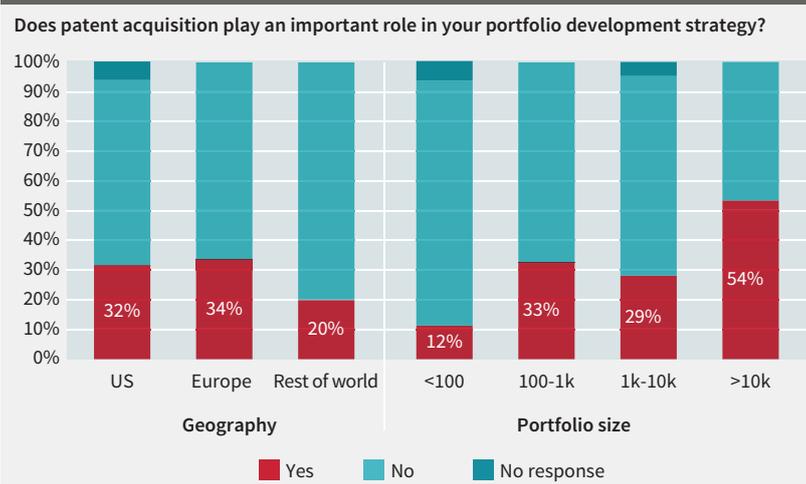
- **Size** – almost half of companies with fewer than 100 patents believe their patent portfolio is too small. At the other end of the spectrum, no companies with more than 10,000 patents regard their portfolio as too big. The more nuanced answer is that owners of large portfolios often regard their portfolio to be “both too small and too big in different areas” (100-1,000: 33%; and 10,000+: 69%).
- **Sector** – the industrials sector scores the lowest for portfolio perfection (8%), with nearly half of software companies saying that their portfolios are too small (46%). A third of companies in the technology sector report being both too small and too big (33%).
- **Geography** – there are geographical distinctions. Over half of companies in the United States think that their portfolios are both too small and too big, against only 25% of companies in rest of world (RoW) (defined as outside Europe and the United States). This needs to be considered against 30% of RoW companies which believe their portfolios are too small, with only 18% in the United States holding that view.

In terms of the overall trend, 68% of companies anticipate modest to significant growth in their portfolios in the next three years, with just 13% anticipating a decline in portfolio size over the same period. That growth will generally come from inventions from inside the organisation. The majority of companies do not regard patent acquisition to be a significant element of their portfolio development strategy. There are, however, significant differences by sector, size and geography with over 54% of owners holding more than 10,000 patents confirming that they do adopt this approach.

“Portfolios are often too big and too small in different technology areas and your patent strategy needs to account for this reality”

- Jared Engstrom, Head of Patent Development, Red Hat

FIGURE 5. Patent acquisition



2. Most patent experts believe that a well-balanced portfolio reduces the threat of patent litigation

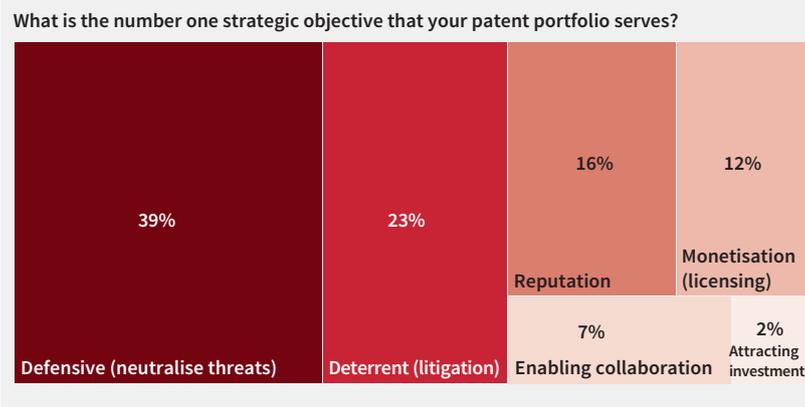
Over 75% of patent owners surveyed agree that a well-balanced patent portfolio reduces the risk of patent litigation. For the majority of companies, a defensive position is the most important strategic objective. (Figure 6)

While the survey identified a range of strategic benefits served by a patent portfolio, 62% of respondents report that their main objectives are either defensive (ie, to neutralise threats posed by other owners of patents) or to act as a deterrent. Figure 6 provides an analysis of the primary strategic objectives.

There are differences in responses across categories of respondent (Table 1). In healthcare (which includes pharma, biotech and medical devices), monetisation is the primary objective, while in the automotive sector half of respondents flagged reputation as the top-ranking strategic objective.

The significance of the majority view that patent strategy is designed around the neutralisation of threats invites further study. Patents have long been regarded as a ‘negative asset’, conferring the right to exclude others from using the invention protected by the patent. It is now common in many sectors for companies with large portfolios to look for the

FIGURE 6. Strategic objectives of patents



freedom to trade without third-party interference (often referred to as freedom of action).

In these circumstances, the function of a portfolio is to create a security blanket around the company, such that all potential intruders are deterred by the risk of counter-assertion – that is to say, the potential impact of the company retaliating with claims against the aggressor that exceed the potential claim.

“The goal is to avoid litigation so having a decent sized portfolio provides the perfect protection for our products.”

- Daniel Hernandez, Intellectual Property Manager, Stryker

TABLE 1. Strategic objectives of patents (by sector)
What is the number one strategic objective that your patent portfolio serves?

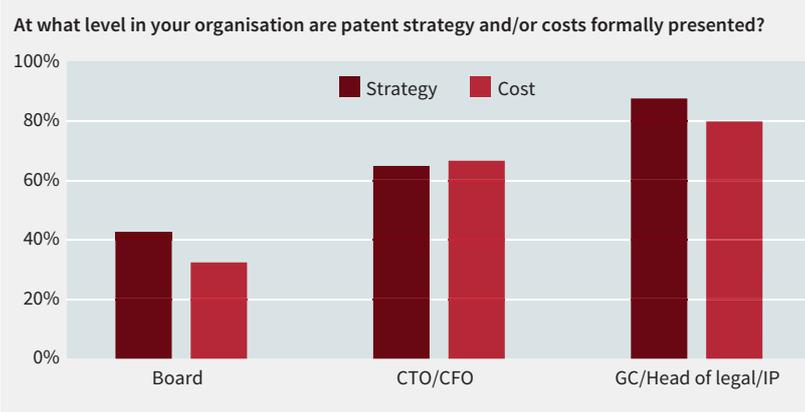
| | Industry | | | | | | |
|--------------------------------|------------|----------|------------|-----------------|------------|-------------|--------|
| | Technology | Software | Automotive | Basic materials | Healthcare | Industrials | Energy |
| Defensive (neutralise threats) | 39% | 46% | 38% | 44% | 23% | 38% | 57% |
| Deterrent (litigation) | 22% | 31% | 13% | 33% | 23% | 23% | 14% |
| Reputation | 11% | 15% | 50% | 0% | 8% | 15% | 0% |
| Monetisation | 17% | 0% | 0% | 22% | 31% | 0% | 14% |
| Enabling collaboration | 11% | 0% | 0% | 0% | 8% | 15% | 14% |
| Attracting investment | 0% | 8% | 0% | 0% | 0% | 8% | 0% |

3. Patent strategy is scrutinised by the CTO, CFO or board in most organisations

Companies across all sectors including industrials, automotive, technology and healthcare are being disrupted by new technologies, and increased attention is being given to both the strategic benefits and cost of building large patent portfolios, with around 70% of organisations reporting scrutiny at CTO, CFO or board level.

It has long been the case that patents have been regarded as a cost – a view held irrespective of whether patent costs are allocated to business units or borne centrally by the legal or IP functions. The survey asked separately about who is scrutinising patent strategy and cost, and the responses are represented in Figure 7.

FIGURE 7. Scrutiny of patent strategy and cost



“To be effective in patent strategy and portfolio optimisation we need to have the best understanding of the external market, the technology landscape and competitive threats.”

- Gareth Jones, Vice President Intellectual Property, BenevolentAI

In over 60% of companies the CFO or CTO focuses on both patent strategy and cost. Results show that the board wants more information about patent strategy than cost, although there is a distinction to be made between large and small companies (Table 2). In situations where the objective is to neutralise threats this means more pressure to have objective evidence in support.

“At the moment, it takes something bad to happen for management to realise the importance of IP. By then, of course, it’s usually too late and costs are even higher. In my opinion, patenting should not be seen solely as a cost, but more as an investment.”

- Andreas Iwerbäck, Director of Group Technology and IP Intelligence, Husqvarna Group

4. Organisations spend on average 9% of their patent budgets on strategic patent intelligence

While over 70% of patent budgets continue to be spent on new patents and maintenance of existing portfolios, on average 9% is being invested on analysis and modelling to communicate the strategic benefit of patent portfolios. This investment is entirely justifiable in an environment where, on average, 4.5% of revenues can be exposed to third-party patent claims.

Companies are investing 9% of their patent budget on strategic patent intelligence. This investment is being made on the implementation of more strategic, objective and repeatable methodologies to optimise the size of patent portfolios.

This level of investment in strategic patent intelligence is broadly consistent across both sector and geography. However, automotive respondents report investment of only 3% of budget on this capability. This merits further investigation in the context of the disruption from both autonomy and electrification, as well as the number of very large portfolios owned by both the manufacturers and suppliers.

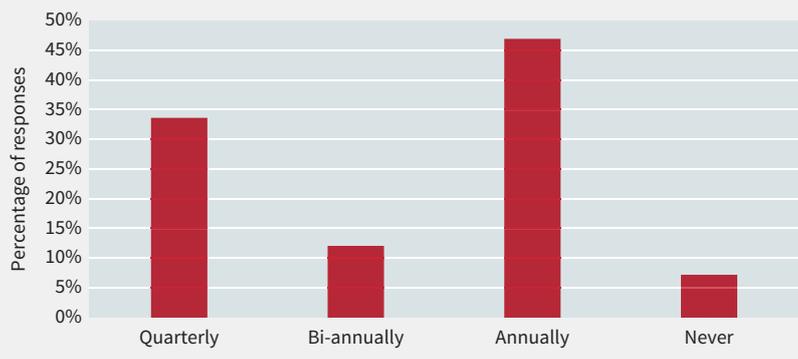
For over 80% of companies, strategic patent intelligence includes routinely tagging their own patents to the company’s products and technologies,

TABLE 2. Patent strategy by geography and portfolio size

| | Geography | | | Portfolio size | | | |
|---|-----------|--------|---------------|----------------|--------|--------|------|
| | US | Europe | Rest of world | <100 | 100-1k | 1k-10k | >10k |
| Patent strategy is presented to the board | 24% | 48% | 70% | 71% | 41% | 29% | 38% |

FIGURE 8. Frequency of portfolio reviews

How often do you assess the shape & size of your portfolio?



Over 40% of companies report that they review their portfolio at least once a year. There is also some evidence to suggest that companies which assess the size and shape of their portfolio more frequently are more likely to believe that their portfolio is not optimised.

Conversely, in organisations where the scrutiny is less intrusive, there is a tendency to believe that their portfolio is perfect.

“If you’re spending several million dollars a year on patent filings and you are filing several hundred new patent applications every year, then it seems like a clearly beneficial trade-off to spend a small portion of those expenses specifically on insights to drive better strategic decisions.”

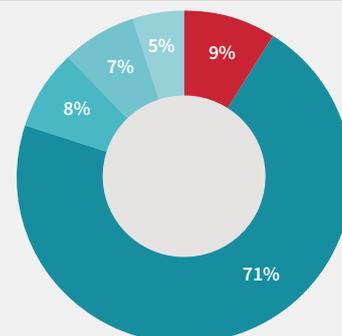
- Jared Engstrom, Head of Patent Development, Red Hat

with less than half tagging their patents to those of their competitors. Further investigation reveals that the impediments to sophisticated threat analysis include accessibility, time and cost involved in the manual processes that have historically been required.

FIGURE 9. Patent budget allocation

What percentage of your patent budget is spent on:

- Strategic patent intelligence and reporting
- Portfolio filing and maintenance
- Licensing
- Litigation
- Other



In order to better understand the levels of investment in strategic patent intelligence, Table 3 analyses a sample of 67 Fortune 500 and FTSE 350 companies with between \$1 billion and \$100 billion of revenue.

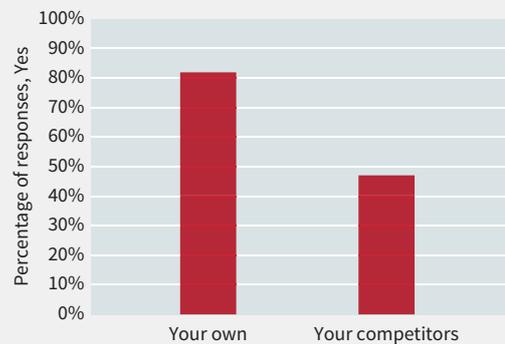
The companies have been banded (A, B and C) according to their revenue range, the mean portfolio size for companies in each band and mean annual portfolio costs (source: Cipher). Combining this with the mean spend on strategic patent intelligence from the survey (9%) enables the mean spend on strategic patent intelligence to be estimated (ranging from \$75,000 to almost \$2 million).

For those who are optimising their portfolios to mitigate risk, Table 3 includes an average maximum exposure to patent royalties or damages. The calculation is based on an average rate of 4.5% (based on the referenced Analysis Group study, Figure 11).

While no company is likely to be exposed to threats to the entirety of this revenue in a single year, it is a useful measure of risk and, in some cases, understates the portion of revenue at risk in the worst case. So

FIGURE 10. Tagging patents to products and technologies

Do you routinely tag your patents to your own or competitor products and/or technologies?



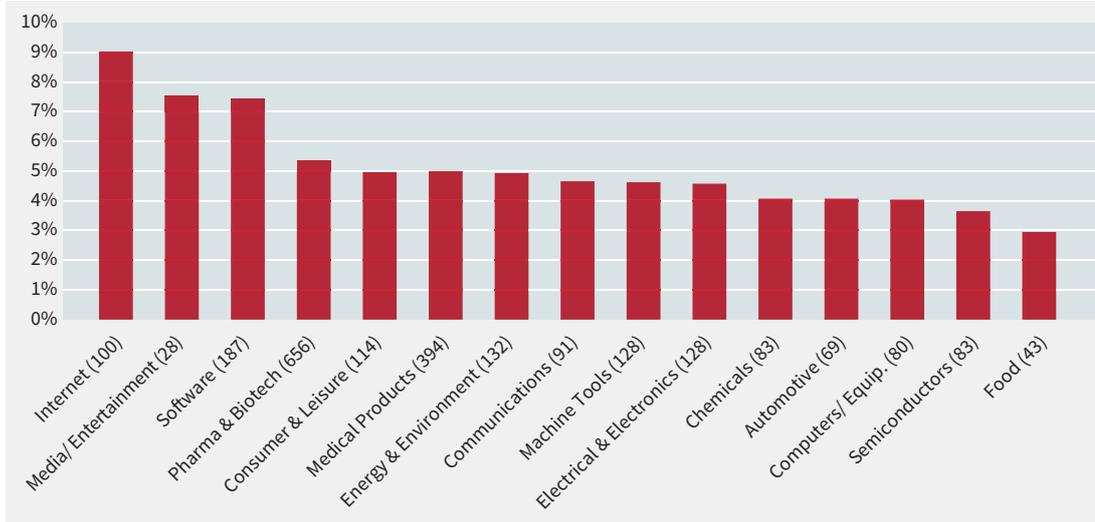
looking at a company in band B, if investment in strategic patent intelligence were to reduce the risk by just 1%, this would be a reduction of over \$4.5 million – a very healthy return of investment.

TABLE 3. Balancing strategic patent intelligence to budget and exposure

| Band | Range | | Mean | | | | |
|------|-------------------|-------------------|---------------|-----------------|--------------------|--------------------|-----------------|
| | Min revenue (\$b) | Max revenue (\$b) | Revenue (\$b) | Active families | Patent spend (\$m) | Max exposure (\$m) | SPI spend (\$k) |
| A | 0.5 | 2 | \$1.5 | 274 | \$0.8 | \$66.2 | \$75 |
| B | 5 | 20 | \$10.3 | 2540 | \$6.5 | \$465.0 | \$585 |
| C | 25 | 100 | \$50.2 | 6507 | \$20.9 | \$2,258.2 | \$1,881 |

Source: Cipher (patent, costs analysis), FT/Fortune 500 (revenue data) Analysis Group (royalty rate used in the calculation of max exposure)

FIGURE 11. Median technology royalty rates



Source: Analysis Group as quoted in Parr, R's "Royalty Rates for Licensing IP"

Suggested model for portfolio optimisation

This survey lends support to the approach suggested in “How Many Patents Are Enough?” (*IAM* issue 97, Nigel Swycher and Steve Harris). In this article, the authors suggested the use of a model that combines patent data with revenue data for both your business and those companies who are perceived to be a threat to your company from a patent perspective. Importantly, the model requires the introduction of subjective weightings to take account of views on both patent quality and the size of the threat posed by a specific third party. This is based on an approach in use in a number of US technology companies.

“All models are wrong, and some are useful. Portfolio balancing using a model provides a methodology that is transparent and capable of scrutiny. This doesn’t mean that you can’t model for subjective elements such as the size of the threat or the quality of the patents, it simply forces you to articulate your assumptions and enables exploration of their impact.”

- Erik Oliver, COO, Richardson Oliver Insights

While models of this sort are objective and repeatable, interviewees confirm that the data required is not always easy to access. There are two different dimensions to this challenge: patent data and revenue data. The challenge of mapping and tagging patents to technologies or product lines used to be a slow and manual task, which itself acted as a deterrent. Cipher and other automated approaches to mapping have greatly increased the accessibility of this data and reduce both the time and costs involved.

“With improvements in AI technology and other analytics platforms like Cipher, today we are able to understand the numbers of patents that are relevant to certain technology areas at a push of a button. This insight can help you determine whether you need more or less [patents] in a particular area and start to set parameters around the investment required to put the company in good standing relative to its business objectives.”

- Jeremiah Chan, Head of Patents, Facebook

The importance of advances in data science is a recurrent theme for those using sophisticated models to help optimise their portfolios:

“Data science and machine learning helps us better manage and shape our portfolio. The ML tools and models we’ve built have enabled us to operate more efficiently and at scale so that we can execute on our patent strategy.”

- Mike Lee, Director, Head of Patents, Google

Finding the right revenue data includes data relating to both your activity and that of your competitors (or other companies on your ‘threat list’). Experience suggests that by combining public sources, industry reports and knowledge inside the organisation, it is possible to obtain sufficiently accurate estimates to build a useful model.

For those who are new to this approach and wondering whether models deliver the answer the question “how many patents are enough?”, reflect on Mike Lee’s answer to the question: “It’s dependent on determining what your business use cases are and then figuring out how many patent assets you need to satisfy those use cases.”

As the business and priorities change, so will the answer. Nigel Swycher, CEO at Cipher, the strategic patent intelligence company publishing this report, sees portfolio optimisation as dynamic: “If you believe that you are perfectly balanced, it is likely that you are simply not looking hard or often enough.”

Conclusion

This report shines a light on the foundational question of how best to establish that a patent portfolio is delivering against patent strategy and aligned to the wider business strategy. It is the stark reality that less than 20% of companies view their portfolio to be optimised. At face value this is a significant concern, as annual spend on patents is over \$40 billion and is increasing.

In a climate where economic growth depends on technology and the IP rights that protect this investment, it is entirely appropriate that senior corporate executives are paying close attention to the strategic rationale underpinning patents, in addition to the blunt measure of cost. The substantial investment in strategic patent intelligence is justifiable not only in its own right, but because of its ability to mitigate the substantial risk of damages and royalties which is the reality faced by organisations across a broad range of sectors.

Teams with strategic responsibility for patents which are able to optimise the size and shape of their patent portfolio are typically those which build trust and respect within their organisation and report that they have much less difficulty in securing the budget they need to build valuable patent portfolios.

“Portfolio optimisation is a key part of a modern IP strategy and is something IP departments need to look at frequently.”

- Matthew Weinstein, Legal Director,
Accenture

It is perhaps telling that this comment from a US head of IP cannot be attributed: “Companies should be spending money on modelling and analytics, precisely because the portions of their portfolio that aren’t directly delivering benefit need can be identified – it’s easy to assume that all patents have value when they do not. Presenting a model generates respect from the finance and product teams.”

Those that are unable to explain the value of patents struggle for recognition, and rightly so.

Cipher, London
March 2020

About this report

The Cipher Report on Portfolio Optimisation is the first global study to investigate the challenges of building a portfolio that is the right size. It is based in a survey conducted in collaboration with IAM between October and December 2019 under the heading “How Many Patents are Enough?”

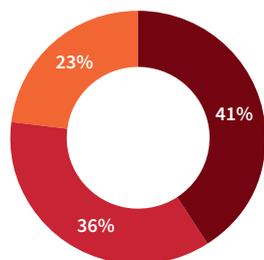
The report builds on over 100 responses to the survey, supplemented by interviews with the IP experts who responded. The report expands on Cipher’s earlier work on the design of models to

provide evidence for those tasked with developing and communicating patent strategy. Responses are international and cross-sector, and include owners of both large and small portfolios.

The vast majority of responses to the survey were from individuals with responsibility for strategic IP decisions, with an average of over 17 years of relevant experience.

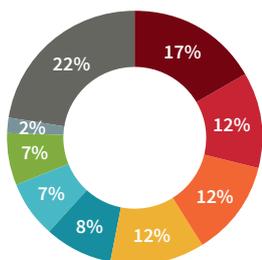
The complete set of survey results is available on request from info@cipher.ai.

Geography



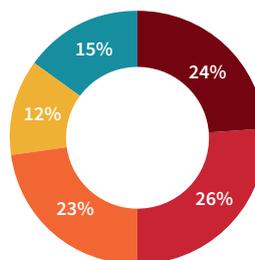
● US
● Europe
● Rest of the world

Industry



● Technology
● Industrials
● Health care
● Software
● Basic materials
● Automotive
● Energy
● Consumer goods
● Prof services

Patent portfolio size



● <100
● 100-1,000
● 1,001-10,000
● >10,000
● Not specified

Total number of respondents = 107. The survey analysis presented in the report includes only responses from companies with patent portfolios. Those respondents identified as professional services, including consultants, have been excluded.