BOARDS OF DIRECTORS AND INTELLECTUAL PROPERTY

AN EXAMINATION OF THE QUESTIONS BOARDS OF DIRECTORS SHOULD ASK REGARDING INTELLECTUAL PROPERTY

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PART 1

WHY BOARDS OF DIRECTORS MUST CONSIDER INTELLECTUAL PROPERTY DURING BUSINESS PLANNING

Intangible assets are increasingly important to business valuation and success, with data showing that intangible assets represent 87% of the market value of the S&P 500. Now, the phrase "intangible assets" can apply to a few particular areas, including the human capital of the company in question. More relevant to the interests of IPVision, the phrase "intangible assets" also applies to a company's intellectual property, and in particular patents.

As such, boards of directors probably have a firm grasp on the intellectual property their respective companies hold, right?

The truth is that, regardless of how much sense it would make to remain involved in the intellectual property their companies hold, many boards of directors failed to consider the importance of their intangible assets until very recently. In fact, for several years, some boards considered intellectual property irrelevant to business proceedings.

There are many reasons for this, but the stark reality is that, although intellectual property represents an increasing percentage of the value of companies, almost no business schools teach anything about intellectual property as a subject for management. It is not surprising then that managers and their boards have deferred to the lawyers when it comes to intellectual property. And, surprise! Do any law schools teach lawyers anything about management? You see the problem.

Fortunately, IP strategy is finding recognition as a crucial part of business performance and longevity—as well as valuation and job growth. Regarding job growth, it's estimated that IP reliant industries are responsible for at least 40 million American jobs.

Because many boards of directors still are unsure how to handle intellectual property, IPVision focuses on the many ways that boards can become more involved, starting with the value IP adds to the company and the questions boards should be asking of their senior management teams. We give specific attention to the innovation and commercialization side of intellectual property rather than the legal aspects, because innovation and commercialization are perspectives that boards of directors fully understand

Responsibility to Shareholders

Perhaps the biggest reason boards of directors should give—and increasingly are giving—attention to intellectual property is their fiduciary responsibility to protect shareholders' assets to ensure they receive returns on their investments. Only recently have they realized that protecting shareholders' assets involves intellectual property, preferring in the past to adopt the "nose barely in, fingers definitely out" policy.

The phrase "Nose in, fingers out" refers to the responsibility of a board to stick its nose into the company's governance matters but keep its fingers off the day-to-day operations. The problem was that this dissuaded them from asking the right questions about the company's intangible assets, such as intellectual property, and how those assets contributed to shareholders' returns on investments.

Questions Boards Should Ask

Now that boards of directors are waking up to the reality that intellectual property is an important and lucrative part of company management and corporate strategy, they're searching for the right questions to ask.

So, what do they need to know?

- What kind of intangible assets does the company have?
- How many/much of these intangible assets do they own?
- Is there inventory of intangible assets?
- Who is protecting these intangible assets?
- How are the intangible assets managed?
- Are these assets adding value to the company? Where, how, and how much?
- How much is the company spending to maintain these assets?
- What efforts are made to monetize these assets?
- How do the company's assets compare to competitors' assets?

As mentioned earlier, not all intangible assets are intellectual property. And not all intellectual property will be in the form of patents. Of course, IPVision is specifically focused on the patents, and that's what this ebook will cover.

We discuss measurement of IP assets and how they can be managed, from the perspective of boards of directors. We'll also eventually discuss the spend of research and development to obtain new patents, as well as the acquisition of patents through purchasing. Finally, we'll talk about the monetization possibilities for intellectual property, which brings us right back to protecting the shareholders' investments.

PART 2

WHY R&D SPEND AND PATENTS SHOULD BE CRUCIAL TO BOARDS OF DIRECTORS

For decades, boards of directors held to the adage, "If you can't measure it, you can't manage it." That standard business expression seemed cut out specifically for intellectual property and other intangible assets. For that reason, most companies have a poor track record of crafting IP strategy and managing their intellectual property assets. Boards of directors didn't think of intellectual property as a business tool. Instead, it was something for the lawyers to handle.

More recently, in say, the last decade or so, IP strategists have begun to emerge to provide information and education on how intellectual property should be protected and potentially monetized. Though board members still aren't getting their fingers in there, the noses are perhaps beginning to sniff out the potential of intellectual property as a lucrative asset for their companies—or perhaps a liability, if not managed correctly.

In many cases, intellectual property could be a company's most valuable asset—tangible or intangible. Attempts to measure and manage intellectual property have been varied, from ratios to peer comparisons, and then a lot of in between. Then, of course, there's the question of how many innovations are resulting in income.

Think of your intellectual property as pieces of real estate. That real estate, and the acquisition of it, requires strategic planning in order to develop it into something of value for the company. Otherwise, it's essentially useless and most likely a drain on your resources. This is why research and development strategy is important.

How Much Does The Company Spend on R&D?

The first measurement, and perhaps the most common, is the amount spent on research and development of new innovations. By discovering the commonalities between the amount spent and the amount earned through the sale of new technology and/or products, you gain a better perspective on the overall investment into intellectual property and the return on that investment.

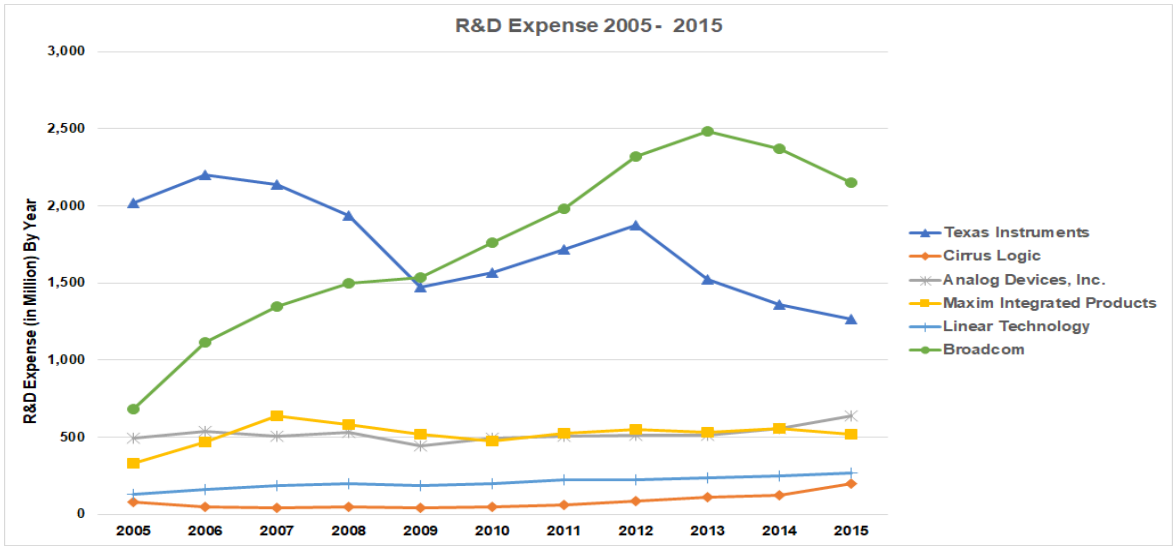
Answering a few specific questions will get you on the right track. First, examine overall spend in absolute dollars. What is your overall output before any other considerations are made? When comparing this to a real estate purchase, you might think only of the purchase price—how much money you'll put into the property without yet thinking of what you might later get out of it.

Is the Company Spending An Appropriate Amount on Research & Development?

Is that amount appropriate, or are you overspending for that property? How could you determine if your expenditures are appropriate for the property you receive in return?

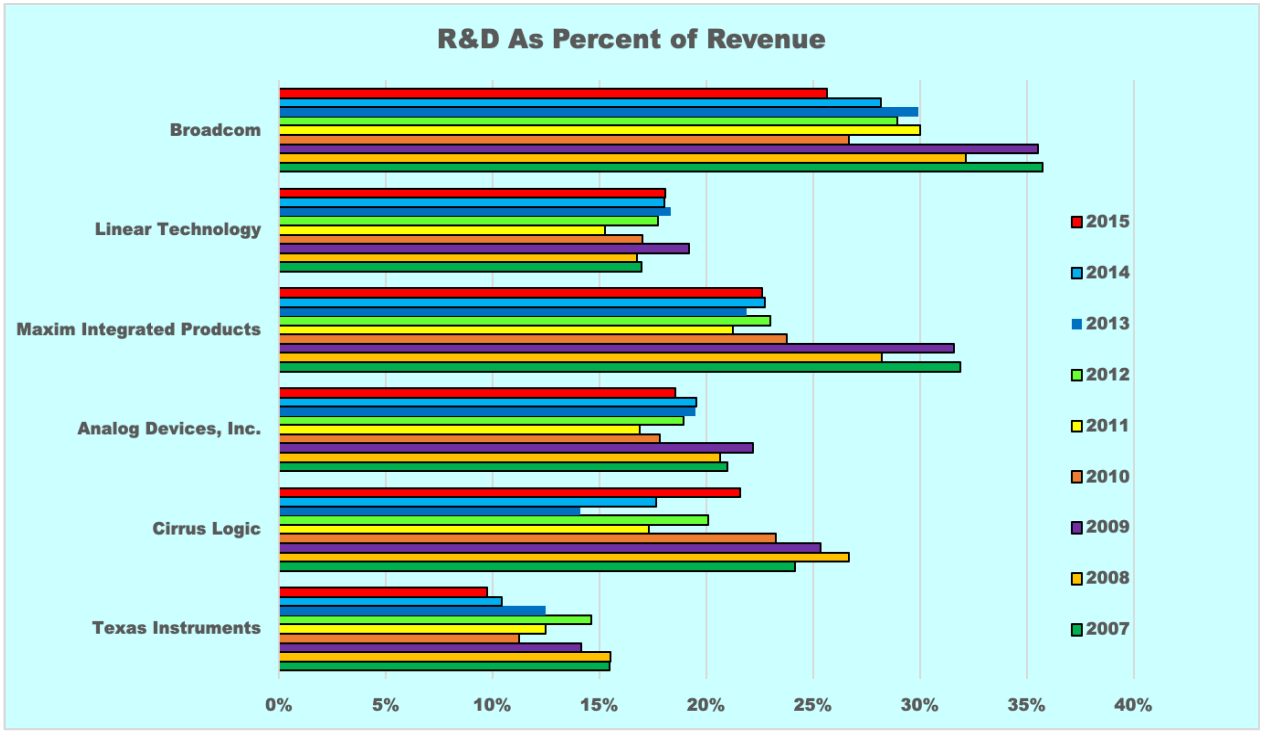
The first and most common step is to compare that expenditure to those of your peers. In real estate, this would be called a comparative market analysis (CMA), wherein you compare the size of the property, its improvements, and its potential to other comparable properties. It's the easiest way to get an idea if you're overpaying for your property.

Let's look at an example. This chart is the absolute R&D Expense in Millions of Dollars for a group of companies in the electronics industry:

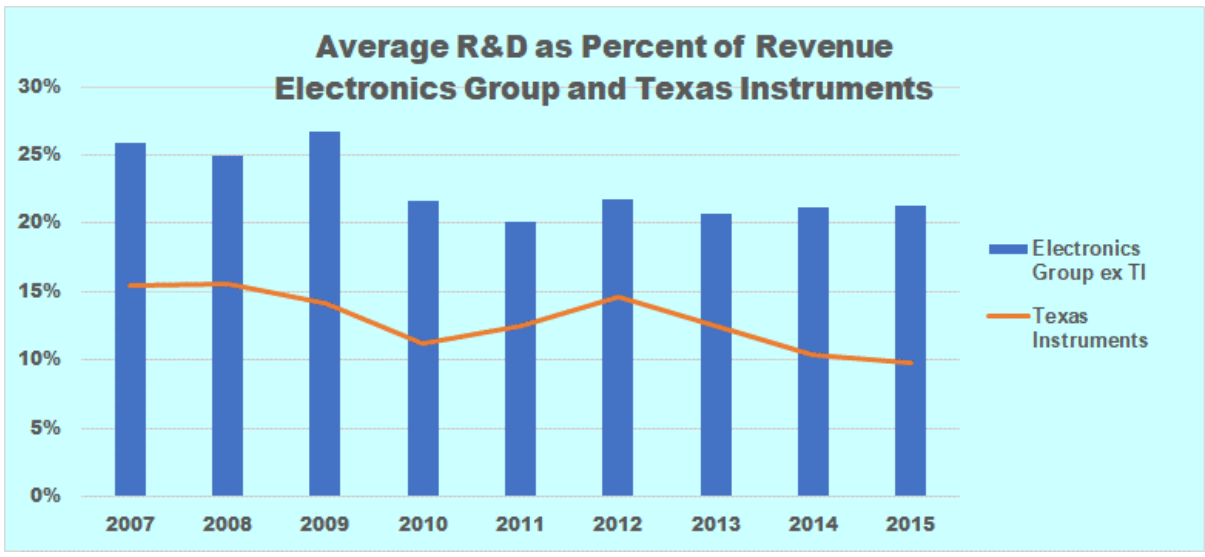


Broadcom and Texas Instruments are spending significantly more on R&D than the other companies, and Broadcom has been increasing its spend rate rapidly.

Absolute R&D Expenditures is one thing. Over the ten-year period shown, Texas Instruments spent about three times per year on R&D as the average of the rest of these companies. R&D Expenditures as a percent of revenue is another view:



As a percentage of revenue, Texas Instruments' R&D spend was actually less over the 2007-2015 time period than the other companies:

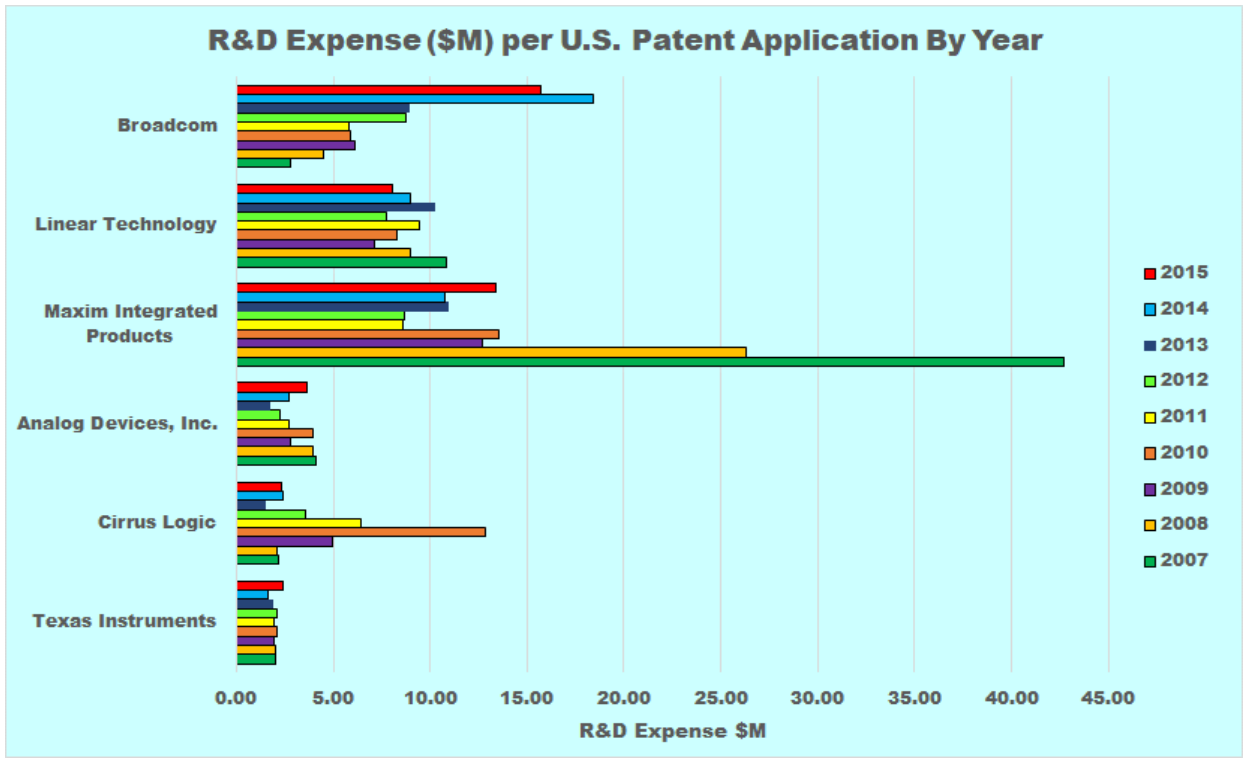


HOW EFFICIENT IS THE COMPANY IN GENERATING AND CAPTURING INVENTIONS FROM R&D?

Now, relative R&D spend isn't the only information you should take into account when determining if your output is appropriate. Next, you'll consider whether the amount spent on R&D is resulting in new inventions. A measure of this is the ratio of R&D spend to the number of patent applications filed per year. As a first pass, you should look at the number of applications filed per year and not the number of patents issued.

There are two reasons for starting here: (1) the amount of time from filing to patent grant can vary greatly (two to four years is typical for many technology areas) and (2) not all applications result in issued patents as a result of the patent examination process, prior art, etc.

By looking at patent applications filed, you can see whether your invention disclosure and capture process is working, especially when compared to peer companies. For example, the company that gets one application per $1m in R&D is arguably more efficient than the company that gets one application per $2m in R&D, all other factors being equal.



A few observations on this chart are in order.

- First, the three companies at the bottom of the chart (Analog Devices, Cirrus Logic and Texas Instruments) have relatively consistent and relatively low R&D expense for each US patent application filed.
- Maxim Integrated files relatively few US patent applications per R&D dollar expenditure. Is this because there are fewer innovations or because of the way their patenting process works?
- Broadcom, in 2014 and 2015, had a jump in R&D expense per patent application, possibly suggesting new research fields being undertaken. A similar question could apply to Maxim in 2007 and 2008.

If new fields of research increase the amount of R&D dollars spent in relation to the patent applications for that year, it's not necessarily a bad thing. The important takeaway is to keep a close eye on that line of research to ensure it doesn't become so unwieldy that you find, years later, that your ratios have fallen out of balance.

That new line of research should follow through later with additional patents to justify, in a sense, the expense of your research. Those patents should then lead to new products.

IS THE COMPANY PATENTING THE RIGHT THINGS?

WHAT IS THE COMPANY'S IP STRATEGY?

Understanding how efficient the Company is in generating and capturing inventions is one measure but boards of directors should be asking if the Company is patenting the right things, i.e., what is the Company's intellectual property strategy?

Believe it or not, many Boards of Directors have zero insight into the intellectual property strategy of the company—or even knowledge of whether a strategy exists. Discover first if there is an IP strategy in place, and what that strategy consists of.

Development Strategy

Let's think again about each of the patents applications that are generated as a result of your research and development activities. If we compare this to the Homestead Act of 1862, you may get an idea of what we mean.

During this time, people were given the opportunity to stake their claim in land across what is now the western United States. Settlers then had to file their claim in the local Land Office and then improve upon that property within the first five years of ownership. Only then could they file for a patent—yes, it was called a patent—also known as a title deed.

Without further development of the land, it became useless to the claimant. That's the first takeaway here. Then, there is the claim strategy to consider. Should the claimant have simply rushed forward and claimed the first piece of land he or she could put a stake in, or was the wiser course of action to inspect the land they planned to claim to ensure it would support life upon it? Marshy or rocky land would prove useless without the ability to grow crops or nourish farm animals.

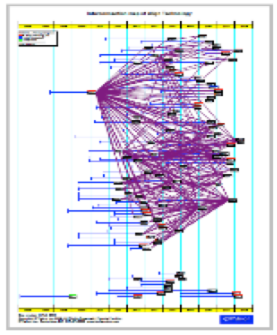
Beyond the quality of the land they claimed, they also should strategize the location of the land. Was it convenient to towns and thoroughfares? Was it adjacent to other land they had claimed—or perhaps adjacent to land claimed by their family? Could they access the land through easements or agreements with other landowners?

When we look at IPVision patent maps, we can see if companies had any strategy when staking their claims through patent applications. An interconnection map showing the cross citation of patents within a portfolio is the first place to start. When patents within that map don't cite each other—aren't adjacent properties that strengthen and quantify the land owned—they're considered a weak portfolio. It's indicative of Wild West style claims, where property was just grabbed without any sort of strategy in mind, and it can come back to haunt you.

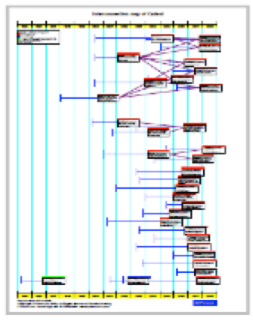
Components of Portfolio Value

- **Does the Portfolio Create and Sustain an (Unfair) Competitive Advantage?**

- **The Importance/Strength of Patents.**
  - Invention/Capture/Extraction
- **Barriers to Entry or Expansion**
  - Protection of Current Revenue Streams
  - Enablement of Future Revenue Streams
- **Freedom to Operate**
  - Can Others Block the Company?
  - Cross-Licensing to Create Freedom



Stronger Portfolio



Weaker Portfolio

Our Products, Our Patents, Our Competitors – Your Patent Rosetta Stone

In evaluating the company's patent strategy, Boards of Directors also need a thorough understanding of the technology the company owns, how that technology is protected by patents, and—most importantly—which products were created with that technology. It's not at all unusual for companies to allow patents to fall through the cracks—to have a very limited idea of the true amount of technology they actually own.

Can you imagine owning two adjacent pieces of land with no idea that those properties connect in some way? It's possible if you weren't responsible for purchasing the first piece of land and you haven't maintained that land and the records well enough to have a full understanding of it.

For instance, imagine you know that you own technology for a vessel that can hold liquid. You are unaware that you also hold technology that provides insulative properties for that vessel, but you do know there's a patent for a handle around here somewhere. Without the vessel, the handle is useless. Without the knowledge of the insulation capabilities, you have no clue that you're holding all the technology necessary to make a coffee mug.

Tracing patents to the technology your company has developed isn't as easy as it may sound, especially if some of your patents are older. You may have even missed out on chances to strengthen your portfolio and the patents within by citing technology you already own, simply because you didn't realize you already owned it.

If you are going to map your patents to your products, which you definitely should, you should consider taking the next step and creating what we call a "Patent Rosetta Stone." As you may recall, the original Rosetta Stone was inscribed with three versions of a decree issued in Memphis, Egypt in 196 BC. The decree had only minor differences between the three versions, which were in Ancient Egyptian hieroglyphics, Demotic script, and Ancient Greek, making the Rosetta Stone key to deciphering Egyptian hieroglyphs.

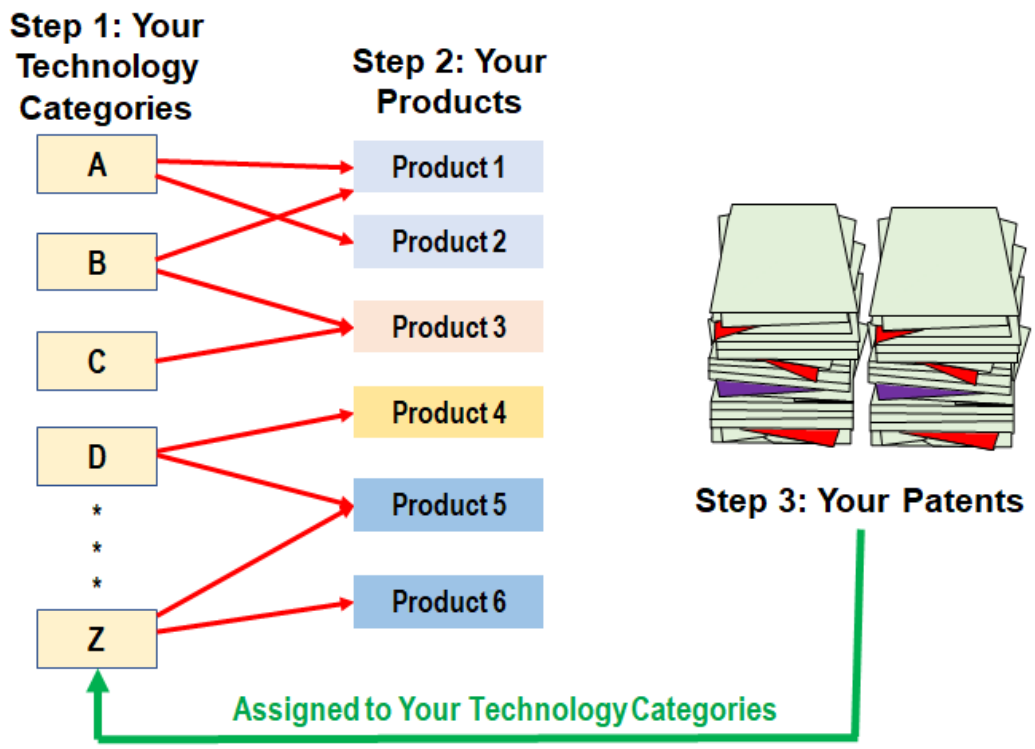
A Patent Rosetta Stone facilitates your understanding of the relationship of your products, technologies and patents. Once constructed, it can also be used to understand these relationships in your competitors' portfolios, as well providing insights into potential emerging competitive threats and opportunities.

How to Create a Patent Rosetta Stone

There are five steps involved in creating a Patent Rosetta Stone. The first three steps are all internal facing:

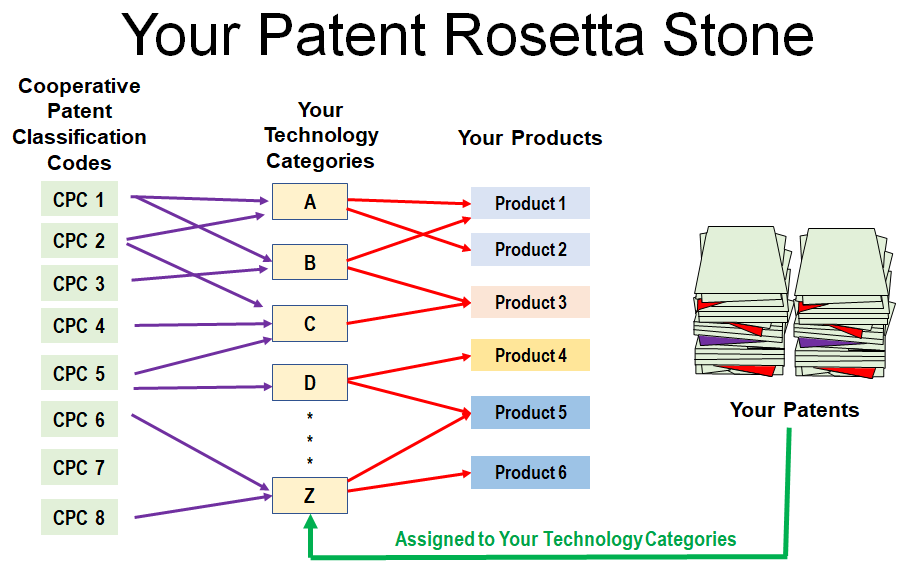
1. Develop Technology Categories. The first step toward creating a Patent Rosetta Stone is to develop or use technology categories representing the various technologies that you have. Each company has a unique company culture and lexicon. This step takes advantage of that uniqueness to anchor the Patent Rosetta Stone in language that your company's culture will quickly grasp.
2. Map Technology Categories to Products. Some, perhaps many of the company's products contain multiple technologies – consider an iPhone for example.
3. Assign Patents to Technology Categories. If the company has many patents this can be a time consuming exercise requiring input from key technical experts and perhaps patent lawyers.

Once you have made these assignments, you should be able to call up a product or product family and get a list of the patents that protect those products.



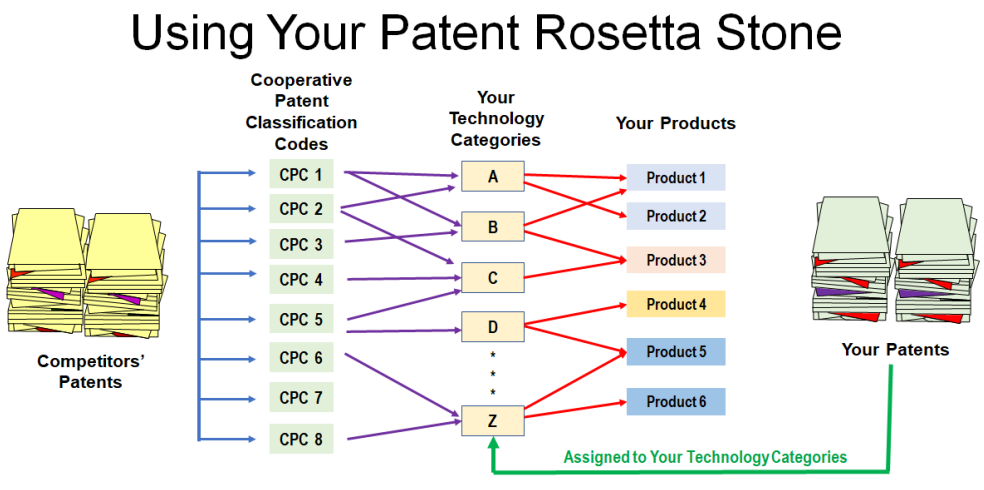
The fourth and fifth steps are the keys to creating a useful Patent Rosetta Stone.

4. Break Out Portfolio by CPC Codes. Take your patent portfolio and break it up by the Cooperative Patent Classification (CPC) codes that have been assigned to each patent by the patent office. These are the codes used in patent prior art searching and examination by the patent office.
5. Assign CPC Codes to Your Technology Categories. CPC codes are a standard coding system that knows nothing about how you describe your technologies. By assigning CPC codes to your unique Technology Categories (your "technical lexicon"), you have your completed Patent Rosetta Stone:



Using the Patent Rosetta Stone

With the Patent Rosetta Stone in place, you can now easily look at a competitor's patent portfolio. To do this, sort the competitor's patents by their primary CPC Codes. Then, use your Patent Rosetta Stone as a "translator" to align the competitor's patents with your Technology Categories and through those to your Products:



You can also use your Patent Rosetta Stone to track emerging competitors and new technologies. On a periodic basis (weekly even), collect the newly published patent applications in the CPC Codes in your Patent Rosetta Stone, and "flow them through" your Technology Categories to your Products. Also, consider whether additional patent filings may be appropriate to stake claims in the newly emerging areas that are revealed through this process.

PART 5

HOW GOOD IS THE COMPANY'S PATENTING PROCESS?

It's easy to assume that a company has a good process in place for determining what to patent. Unfortunately, this is often not the case—even for large companies with resources. Certainly, some inventions should come from planned research and development.

These are the two major sources for the "patent funnel," which has to be vetted by the company, usually through the establishment of a Patent Review Committee. Ideally, the Patent Review Committee is considering the protection of two things: (1) current and planned products/services and (2) revenue streams. Well-functioning Patent Review Committees also consider whether an invention supports strategic business objectives, like limiting a competitor's expansion room. Well-managed invention disclosure programs can elicit new business ideas, but this doesn't happen as often as it should.

In most cases, engineers and scientists who have spent a lot of time with research and development will comprise Patent Review Committees. These Patent Review Committees then encourage productivity so they can make decisions about the patents the company will pursue.

As "normal" as a Patent Review Committee entirely composed of scientists and engineers may be, we believe it's important for Boards of Directors to also be involved, at least on some level, in the decisions about the technology being developed and the patents that will ultimately result from that technology.

Patent Review Committees should work with a set of parameters that ensures decisions are held to specific metrics—key performance indicators—for the strongest possible patent portfolio. While many of these metrics may vary between companies depending on size, money spent, and the number of patents ultimately applied for and granted, several performance indicators should exist on every patent review committee's list.

- How many cases are being handled?
- How many members of the patent review committee are involved on a regular basis?
- How many patents pass or fail within each technology area?
- How vast is the spread of ratings for each of the patent cases?
- How long does each case take to decide, from first report to final decision?
- What is the overall quality of the resulting patents?

How Good Is the Company's Patent Prosecution Operations?

As we have seen, looking at R&D Spend per patent application filed is a measure of the efficiency of the invention disclosure and capture process. The next question is whether the Company is actually obtaining patents, -i.e., what percentage of the Company's patent applications result in issued patents? If a large percentage of applications are abandoned[1] it could be that there is prior art that should have been found before filing or it could mean that the lawyers prosecuting the applications are not doing a good job. A related question is: How much is the Company spending on patent prosecution? The patent prosecution spend data is known by the company but is not public, so it is hard to do peer comparisons on this issue.

**There are other possibilities. One company we encountered had a central R&D department that filed applications vigorously and then "shopped" the invention to the business units. If no business unit "picked up" the invention then the company simply abandoned the related applications. After decades of this approach the company changed the process and had the R&D department focus on what the customers of the business units were telling the company about the products and features they valued.

PART 6

HOW "GOOD" ARE THE COMPANY'S PATENTS?

To this point, we have discussed the importance of IP and the high level questions a Board of Directors should ask Management. These questions cover a wide range, believe it or not. It's never so simple as simply knowing which patents the company holds, though many Boards leave even that much to the IP lawyers. We started with the deep dive into research and development, with questions such as:

- Are we investing the appropriate amount in R&D, both in absolute terms and versus our peers? As we have shown, a key metric here is R&D as a % of revenue.
- How efficiently are we "harvesting" some of the value of that R&D by creating intellectual property in the form of patents?
- Do we know what technologies we have and how they relate to our products and strategies?

The next two high level questions a Board of Directors should ask are:

- How "good" are the patents the company is getting?
- How, specifically, do these patents add value to the company?

First, let's explore the "how good" question. To do so, we'll need to begin with a little background about patents. Let's return to our earlier description of patents as real estate. One fundamental right you have when you own a parcel of real estate is to prevent trespassers from walking on or using your property. However, it's important to note that this does not necessarily mean you have a right to use your real estate.

What? How could that be true? What would be the point of buying real estate, then? You're starting to make our point for us, but let's examine why.

If your parcel of real estate is "landlocked" because someone else owns all of the adjacent property, you have no way of reaching your parcel unless you and the other landowner reach an agreement to provide an easement.

So, what determines the boundaries of the real estate parcel? In actual real estate, we have the survey to mark the legal boundaries, and then we put up fences to keep others off our land. Strong fences obviously work better at deterring trespassers, right? The Great Wall of China didn't keep the bad guys out forever, but it certainly held them off for a while.

Patent Claims as Fences

The strength of your patent "fence" depends on the quality of the patent claims. How clear is the language? How strong is it? Are terms vague, like a rotting cedar post fence? The Great Wall of China was built in the 7th Century BC and withstood trespassing attempts until 1878. If we compared the strength of that "fence" and my neighbor's, which is currently falling over, to the strength of patent claims, which do you think would be a more lucrative choice?

Sure, the Great Wall did eventually fall after nearly a thousand years of attacks, but the rotting fence is no deterrent at all.

How can we determine the strength of the "claims fence"? There are two basic questions: first, is the claim well written, does it clearly describe something? Second, what does it describe? IPVision Claims Analysis answers the first question using an expert system of claims interpretation rules from actual court cases and from IP licensing and litigation experts. We use the rules from these experts because unlike the patent prosecution lawyers who write patent claims and represent you in the Patent Office, the IP licensing and litigation experts see what makes a claim strong or weak when it is tested in actual business situations or court cases.

IPVision Claims Analysis examines each section of the independent claims of a US patent or application and generates over forty separate claims vectors. These claims vectors are analyzed using proprietary algorithms and rules provided by the experts and extracted from relevant court cases, ranging from simple measurements such as claim length to complex attributes such as preamble to claim ratio, number of occurrences of terms, and more.

There are a number of insights that come out of an IPVision Claims Analysis, but there are two key metrics:

- How Broad is the Claim: Breadth/Scope Rating of A, B, C – where A means Broad Scope and C means Narrow
- How Well Written is the Claim: Structure Rating of 1, 2, 3, 4 or 5 – where 1 means no obvious language defect issues and 5 means a number of potential interpretation problems

What Claims Analysis Can Tell You

When you can see the quality of the Company's patents you can ask questions such as:

- Which internal lawyer or which law firm is getting the Company the best patents?
- How does the Company's claims quality stack up against others?

IPVision has a case study about the use of Claims Analysis to select and monitor patent law firm quality and patent spend. For example, if the quality of the patent claims of a patent application is decreasing during prosecution perhaps we should not continue to spend money on that application.

Claims Benchmarking

How do the claims of the company's patents stack up again the claims of their "peer patents"? A "peer patent" is a patent (a) in the same technology area and (b) granted during the same time period as the patent in question.

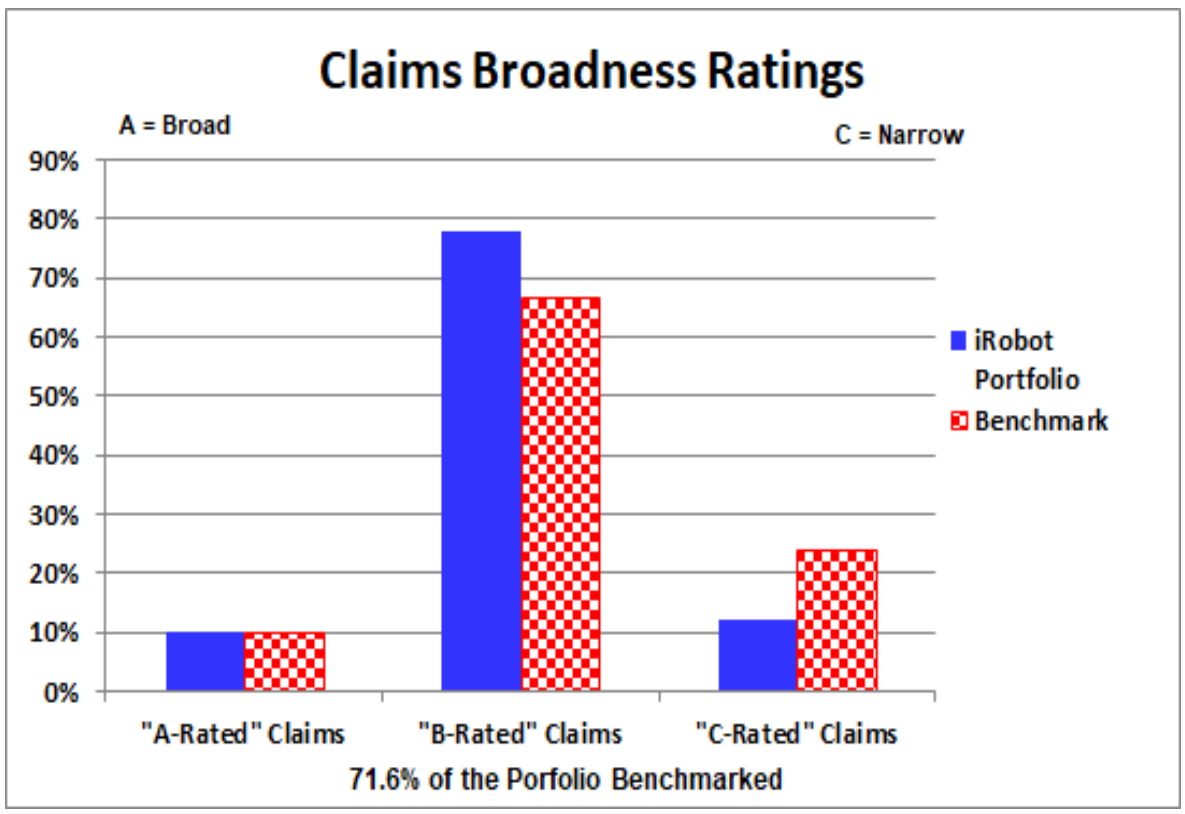
These two criteria are crucial because when a technology is "new" there is more "land" to claim. As the technology matures the opportunity for broad claims decreases and the narrowing of claim language introduces more opportunity for structural issues to arise which makes it harder to interpret and enforce the claims.

IPVision Claims Benchmarking can be done on a company's entire portfolio or a technology or product area. Here is an example of Claims Benchmarking for iRobot.

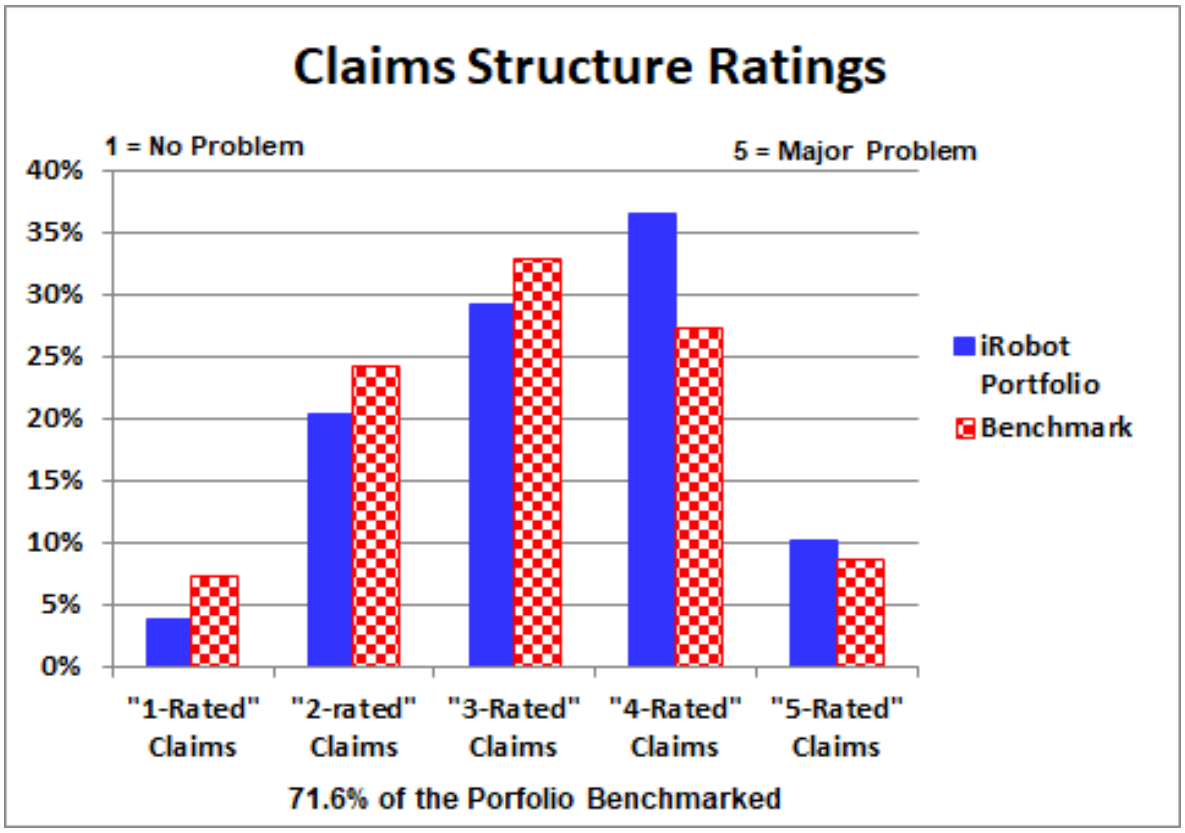
Example: iRobot

In this example, we benchmarked the claims of US patents in the top five Cooperative Patent Classification (CPC) System Technology Subclasses in the iRobot portfolio over what was at that point the previous 10 years. These patents comprised 71.6% of all the US patents in the portfolio (341 patents and 739 independent claims).

The Benchmark consisted of 24,957 US patents in the five CPC Subclasses and in the same timeframe. These patents have 59,625 independent claims. The Broadness and Structure comparisons are shown in the following charts:



The Claims Broadness Ratings for the iRobot Portfolio benchmarked is slightly better than the benchmark, with A-Rated claims being in line and B-Rated claims being about 11% points better in the iRobot portfolio.



The Claims Structure Ratings shows that the iRobot Portfolio Benchmarked has significantly fewer “no problem” claims and significantly more “4-Rated problem” claims than the Benchmark. Conclusion: this “first pass” analysis suggests that the patents in the iRobot Portfolio could be overall somewhat “weaker” than their peer patents from an enforceability or licensability viewpoint. There is a caveat: further analysis is required in order to determine the relationship between these weaker patents and the major revenue and profitability components of iRobot’s business.

[redacted]

PART 7

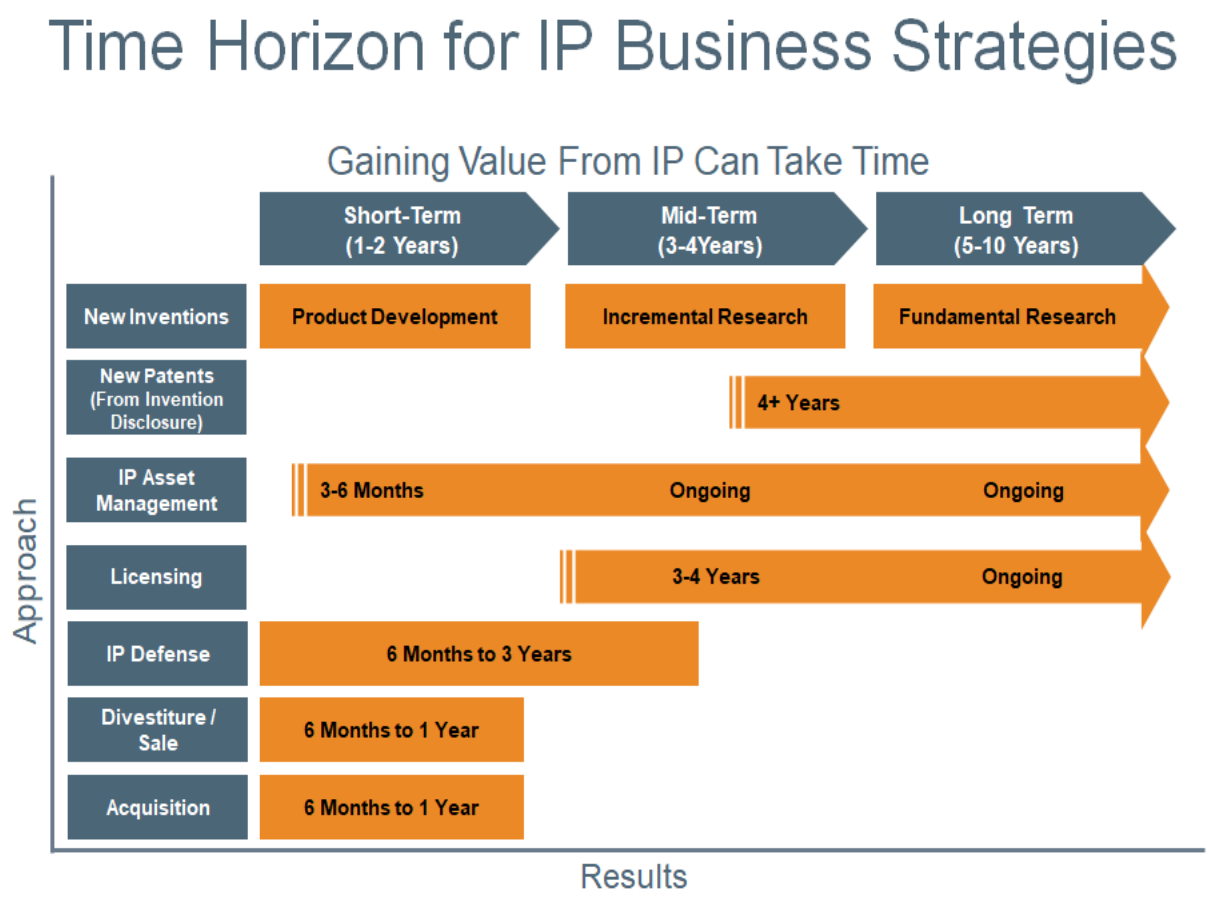
IP STRATEGY REVISITED– TIME HORIZONS

We have discussed the importance of intellectual property and the questions that Boards of Directors should ask about their company's IP. These questions are really an "as is" assessment. What are we spending on R&D—actual and relative to competitors? Are we harvesting the output of R&D and turning it into intellectual property to benefit the stakeholders of the company? These questions are just the beginning.

Once the Board has understood where the company is, it needs to consider where it should be going. Without a solid understanding of the various time requirements for IP strategies, Boards can enter discussions with unrealistic expectations that can harm a company's present and future.

We've previously discussed the amount of time a new patent can take, from application to the day the patent is granted. The truth is that many Board members may not even understand this, the most well-known of time horizons in an IP strategy. Other aspects of intellectual property strategy can take more time than Boards of Directors might expect.

There are many dimensions to intellectual property strategy including "time":



The Basics:

The "blocking and tackling" of R&D, product development, patenting and IP asset management is illustrated at the top of the chart. At its best, this is an ongoing, consistent, and thoughtful process with a mid- to long-term time horizon.

Licensing:

Out-Licensing (licensing your technology to others) can take a surprising amount of time to get going as you assess what you have and what you need and build a case for others to license. That is what is depicted in the chart above. In-Licensing of individual patents or a portfolio can happen much faster.

IP Defense:

This category represents patent litigation as you defend your territory from infringers or competitors. The timeframe shown represents an average range of time for litigation.

Acquisition/Divestiture:

This category represents the outright sale or purchase of a patent or portfolio. It can be sale or purchase of the assets directly or the acquisition of a company or the spinoff/sale of a business unit.

Understanding the time required for various IP strategies can help you make more informed decisions for your company's long-term success. There are many aspects to each of these strategies, but for the remainder of this discussion, we will focus on the Make/Buy question.

PART 8

SHOULD THE COMPANY MAKE OR BUY AN IP PORTFOLIO?

Let's return now to the mental image of a piece of real estate. If your parcel of real estate is "landlocked" because someone else owns all of the adjacent property, you have no way of reaching your parcel unless you and the other landowner reach an agreement to provide an easement, or a license to cross the land.

How can you create an easement when the property owners around you have built something akin to the Great Wall of China? Your only choice is to find the property that works best for your needs and negotiate the use of that property. If we were to compare this to intellectual property, this would be licensing the patents and technology you need to further develop your property, or perhaps acquiring the patent or patent portfolio. It takes time to build a patent portfolio organically. There is R&D that hopefully leads to inventions that are captured in patent applications some of which result in issued patents. This process can take three to six years, or more.

An alternative or complementary strategy is to acquire the intellectual property you need either through the purchase of a patent portfolio or the acquisition of the company holding that portfolio.

What Do Patents Cost? The Cost of the "Make" Side

Cost is obviously a key component of the Make/Buy IP strategy. You must consider all costs involved in acquiring patents—whether through patent applications or through the purchase of or merger with another company. When it comes to patent costs, a single patent with coverage in the US, EU, and Japan can cost up to $100,000, with even more spent over the course of twenty years to maintain those patents.[1] Without funds spent for maintenance, the company might risk the possibility of their patents expiring or losing effectiveness.

Because of the cost of patents, many companies historically delayed filing patent applications on R&D inventions until the resulting products were ready to go to market.

There's a very specific problem that can arise when waiting for product launch to apply for the patent—and that's potential disruption. Work within the research and development phase isn't protected, at least not without a patent application. Without patenting the various technologies your R&D team is exploring, you could end up giving away millions of dollars, simply because you chose not to spend the additional money on a patent.

Before 2011—the year the America Invents Act was signed into law by President Barack Obama—the "first to invent" was the winner. After the act went into effect, the law changed to protect the "first inventor to file" a patent application. In other words, if you're the first to invent something but don't protect it with a patent application, then your competitors can file first and snag that technology for their own financial gain.

At IPVision, we have seen and worked with a number of very large companies that don't file patent applications until a product is ready for market. In one notable case, the company spent eighteen months in consumer and product testing, only to find that, in the interim, several smaller, more agile innovative companies had filed patent applications on several key components of the product, features the large company could have filed on but didn't. As a result, the large company decided not to proceed after spending eighteen months of valuable internal and costly external resources.

[1] In 2002 the United States General Accounting Office released a study that showed that for small- to medium-sized businesses the minimum cost to obtain and maintain a single patent in 10 major industrialized companies ranged from $170,000 to $340,000 over the life of the patent ($247,000 to $494,000 in 2020 dollars). This includes initial lawyer fees, government office filing fees, lawyer prosecution fees and over the life of the patent, required maintenance and annuity fees. The range depended on the technology field involved. Amounts are higher for larger companies because patent office filing and maintenance/annuity fees are less for smaller entities. https://tinyurl.com/GAO-Patent-Cost

Yes, it costs money to obtain patents—a lot of money, as we've discussed. However, what would happen if a competitor developed similar technology and managed to bring it to market—after your company chose not to apply for a patent?

Fortunately, the "file patent applications and iterate" approach of Silicon Valley disruptors does not have to cost a lot of money. Provisional patent applications can be filed for $140 or so and provide a one-year head-start until the more expensive full utility patent application has to be filed. Interestingly, the response of patent lawyers at one very large consumer products company to the question of "Why don't you file provisional applications?" was, "It is too hard to keep track of them."

Wouldn't any board of directors be interested in knowing how much money they're throwing away on research that ends up with another company's name on it?

Now that we have an idea of cost, timing and strategy on the "Make Side" of the Make/Buy question, let's look at the "Buy Side."

When discussing the acquisition of intellectual property, there are two options available: acquire the entire company or acquire a portfolio of technology.

Why Boards of Directors Should Assess IP During M&A

Traditionally, intellectually property was considered a risk factor during mergers and acquisitions rather than assets. Those managing M&A determined only if the target company for acquisition held the IP necessary to operate its business before then identifying the potential exposure to infringement cases or loss of licensing opportunities after the company changes hands.

This is a rather backwards approach to IP as a part of any merger or acquisition, and many companies are beginning to take note. With boards of directors on board, putting IP at the forefront of M&A deals could result in big boosts to bottom lines—or at least a chance to cut monetary waste for streamlined portfolios that build the business rather than weighing it down.

Not Just in Theory – IP at the Front End of M&A

We assisted a $2 billion+ revenue brick-and-mortar based company that sought to acquire online providers to expand its business and move into the digital world. On their own, their M&A analysis team identified ten potential targets, one of which was a $200M revenue company (Big Target). Among the other nine targets there was a $20M revenue company (Small Target).

After the traditional first pass of analysis, the brick-and-mortar company decided the Big Target was the best target, and for several good traditional business reasons, such as:

- Big Target's $200M in trailing 12-month revenue would move the needle as a short-run increment to the company's $2B revenue.
- Big Target's revenue had increased at a 35% compound rate over the past 3 years and was projected to accelerate.
- Overlap with the company's existing customer base and significant new customer opportunities.
- Big Target's management team had worked together effectively for over 5 years and could be incented to continue on.
- The projected EPS (Earning Per Share) of the combined entity was immediately accretive.

With all of this information in mind, it's easy to see why Big Target appeared more favorable. However, none of this took the intellectual property of the Small Target and Big Target into consideration.

Fortunately, at this point during the merger, someone considered IP and how it might affect the acquiring company in the future. IPVision was able to provide rapid analysis of the various targets, including the Big Target and the Small target, as well as everything in between.

After a patent position assessment screening, IPVision discovered that the Small Target held key patents in the emerging space. Though they were only, at that time, a $20M revenue company, they had built a strategic portfolio that provided significant potential for innovation and, eventually, increased revenue.

The Big Target, on the other hand, presented a high risk of future patent litigation due to the patents held by Small Target. A merger with or acquisition of the $200M Big Target could have been immensely disruptive to Acquiring Company's management and business and severely undercut the potential for success.

Instead, IPVision recommended acquiring Small Target to access the intellectual property rights in question, and then use that when determining an acceptable price for acquiring the Big Target.

Bringing Due Diligence Into the Board Room

The potential pitfall this acquiring company avoided could—and does—affect many other companies that don't put IP at the forefront of their M&A considerations. For this reason, above all others, boards of directors should take an active interest in the patent strategy involved in any mergers or acquisitions planned for the future.

In most cases, the review of aTarget Company's patents is handled by lawyers due to the potential complexity of the legal issues involved in prosecuting and enforcing patents. However, IP considerations involve so much more than legal analysis to achieve the goal of a due diligence investigation of a Target Company, namely the identification and allocation of IP-related risks.

Beyond the potential risks involved, there are also business considerations to take into account. With the analysis provided to the Acquiring Company in our previous example, a path to greater business success was presented—a path that included more stability within the intellectual property arena and also greater revenue down the road.

To achieve this goal, a Due Diligence Team should be assembled consisting of technical, business, and legal experts, and intellectual property holdings of all potential targets should be assessed during the first round of due diligence.

What Boards of Directors Should Ask About Intellectual Property During M&A

As part of the merger or acquisition process Boards should seek answers from management to these IP related questions:

- How does management assess patent quality and risk: the use (and misuse) of software-based analytics.?
- What are the best practices in evaluating patent quality, impact and value?
- How does a prospective patent buyer efficiently diligence a very large portfolio (i.e., thousands of patents)?
- What should prospective buyers look for in an analytics platform?
- How should buyers integrate automated and human patent analysis?

Without asking these questions, you really do run the risk of opening your company up not just to potential infringement cases in the future, but also loss due to waste or poor patent management.

Where Boards Should Address Due Diligence

Boards of directors should make sure that Management addresses patent due diligence early in the M&A process and often. At the highest level, these areas to address include:

- Ownership and control of target company intellectual property
- The structure of the proposed transaction
- Identification of strategic value of the Target Company's IP
- Target (and Acquiring) Company exposure to liability from intellectual property of others

To address these issues, you must first identify the intellectual property assets the Target Companies own. Next, identify your company's ability to control those assets. To do these things, you must:

- Assemble patent portfolios for the Target Companies
- Examine the recorded ownership of the assets within each portfolio
- Review the chain of title for each of the patents
- Examine the licensing rights for all intellectual property in question, although this is often difficult to do upfront because licenses usually aren't "recorded"

In an ideal merger or acquisition, the Target Company has already gathered the pertinent information, mapped its patent portfolio to the products it manufactures and the technology it licenses, and can directly point to the parts of the patent portfolio that protect various lines of business. However, rarely is the world of M&A ideal.

If you're fortunate, the Target Company has done some basic analysis of its intellectual property. In most cases, however, the research—if done at all—will be scant at best. Target Companies often consider this type of analysis too time consuming to be performed during such a short time frame during the acquisition due diligence window.

If you have been building your cash reserves in advance of expected M&A activity when prices and timing are right, now is the time to prepare by researching and understanding the general intellectual property landscape in the sectors you are currently in or expect to be in the future.

PART 9

A CLOSER LOOK AT PATENT QUALITY DURING M&A

Comprehensive IP assessment is crucial to the business acquisition process to help buyers accurately assess a technology sector, the players engaged in it, and the IP affecting it.

A Tale of Two Portfolios

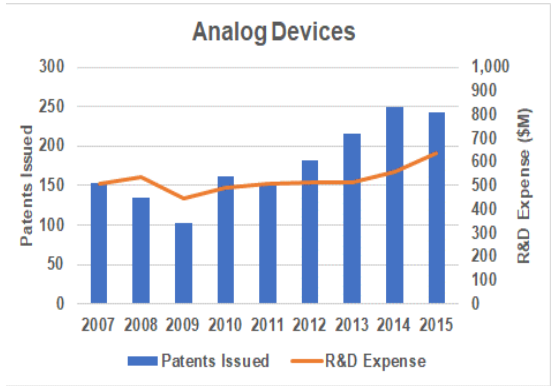
When acquiring a company or one of their patent portfolios, it's important to investigate the patent claims to make sure you're not getting landlocked property with rotting wooden fences. The desired outcome is, of course, to acquire property that benefits your R&D, product development, and monetization possibilities.

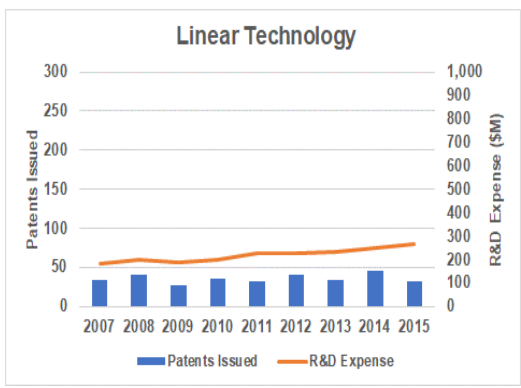
This kind of structured approach to patent analysis and acquisition due diligence leverages a range of proven research methods, analytics, and expert systems to analyze potential acquisition targets for purchase or lease and reveal:

- How novel is the IP?
- How well-written is it?
- Is it being cited by its peers?
- How is it positioned among its peers?
- What would the world look like if a competitor acquired the target?

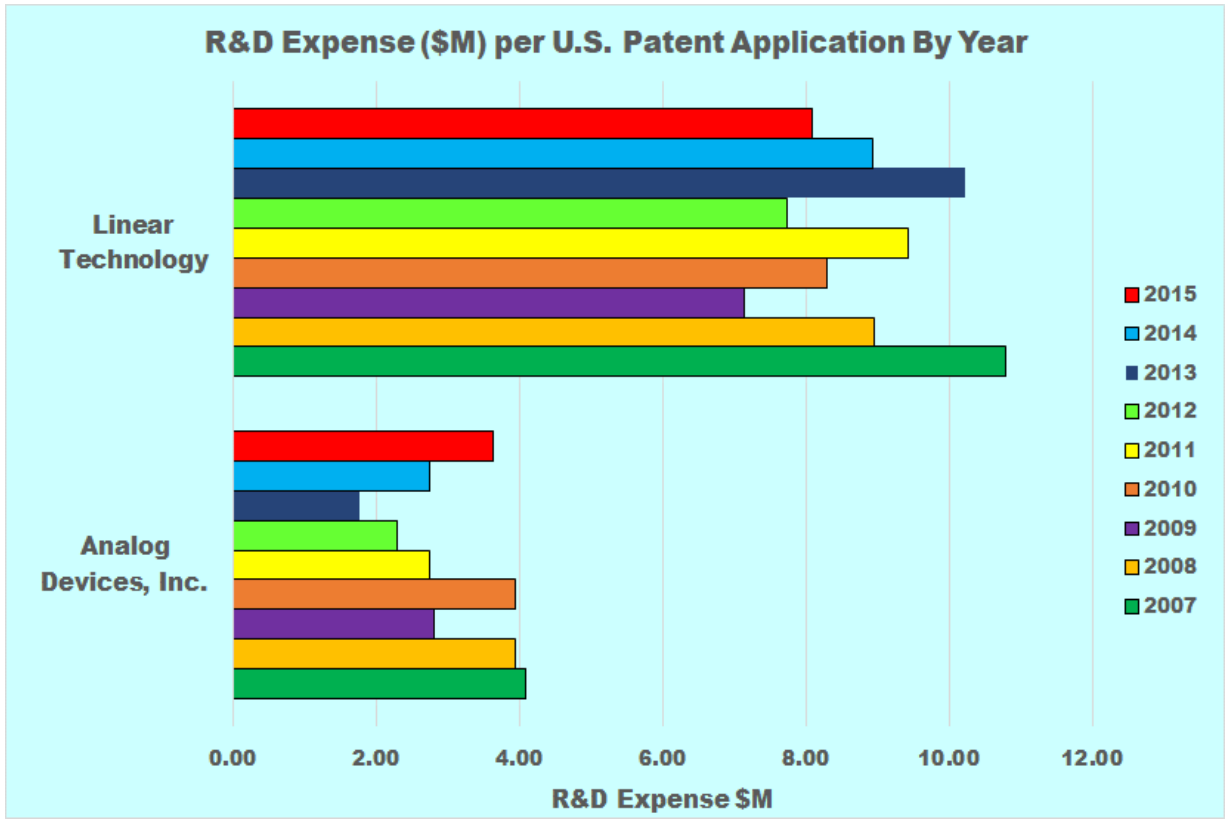
Case Study: Analog Devices and Linear Technology

In 2016, Analog Devices acquired Linear Technology and the patents within their portfolio. Here are excerpts from our earlier R&D Spend and Patent charts:



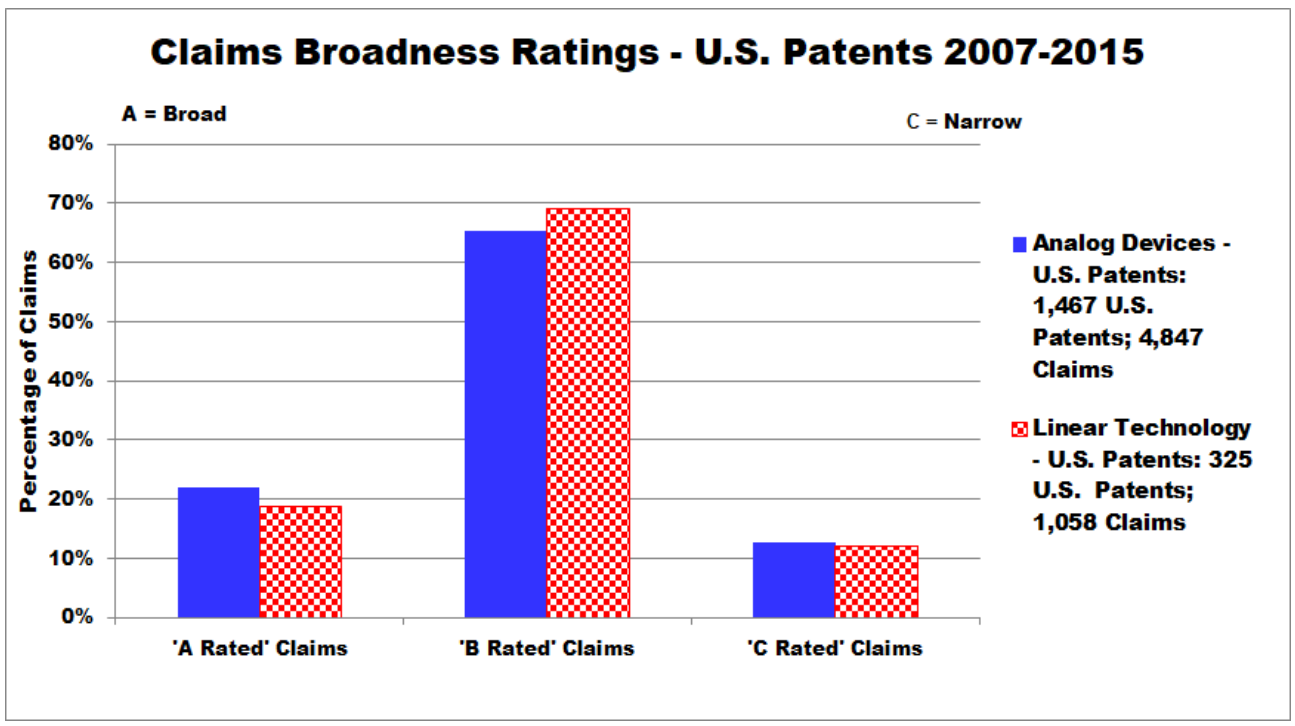


On the metric of "R&D Expense ($M) per US Patent Application By Year", Linear spent almost 3 times as much on R&D for each application (average $8.85M) as Analog Devices (average $3.1M):

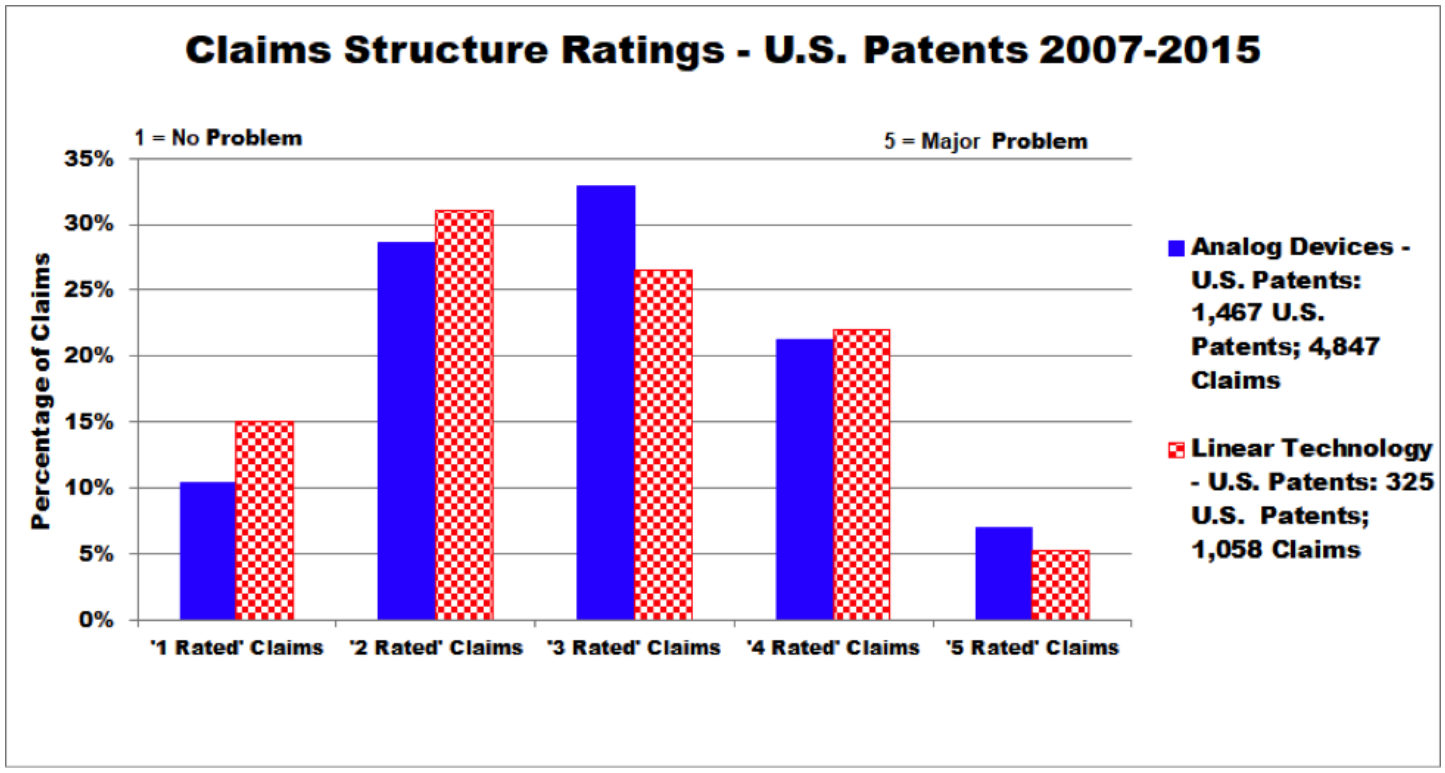


Below, you'll see Claims Analysis charts for both companies that include US patents issued from 1/1/2007 through 12/31/2015.

As you can see from this chart, Analog Devices has a slightly higher % of "A Rated," i.e., broad claims.



Structure: In this chart, however, you'll see that Linear's patents are of higher quality, with more "1 – problem" and "2 – minor issue" rated claims from a structure viewpoint.



In this particular case, Analog Devices was fortunate to acquire property with strong fences, which only added to the strength of their own property protection.

If there are true innovations coming out of R&D and not just minor add-ons and extensions, you would expect the Structure ratings to be better. The reason is because there is more "land" to claim in a new technology or innovation. As an area of technology matures, there is less land to claim and patent claims become longer and more verbose in order to work around prior art. This introduces more limiting clauses, confusing wording, indefinite terms, and other language issues. Our strength ratings pick these up.

You might be interested to discover that our findings through our Claims Analysis program match the opinions of several close to the acquisition, as well as reporters who were surprised by the deal.

Here are some interesting quotes from that article that suggest that Linear was more innovative:

"Linear Technology was founded 16 years after Analog Devices was established in 1965. The startup quickly turned into a bastion for analog design, in an industry shifting toward digital circuits with the rise of personal computers. Its first employees were defectors from other Silicon Valley companies — including National Semiconductor, where Swanson served as vice president for analog design — that had been leaving analog behind.

"Swanson's exit created a vacuum that sucked in other analog gurus. These included Dobkin, George Erdi, and Bob Widlar, a former Fairchild Semiconductor engineer who later became known as the "god of the operational amplifier." The initial migration turned Linear Technology into a destination for analog engineers and eventually into something like an apprentice program for students of the analog craft.

"Linear Technology has leaned on the expertise passed through its ranks. For most of his career with the company, Swanson rejected the idea of buying new technology through big acquisitions. Instead, he favored developing new circuits in-house. Linear has only made one acquisition in its history — Dust Networks, a wireless sensor networking company, in 2011."

This is not so say that a company with better claims structure is more innovative per se. An innovative company could end up having poorer quality lawyers. However, when your plan is to acquire innovative technology and the people who made that technology, then the claims structure rating is another metric that can confirm your business case.

PART 10

CONCLUSIONS NEXT STEPS

Regardless how long you've served as a member of the Board of Directors for your company, you may have seen some information here that you had never before considered. As we said from the beginning, intangible assets such as intellectual property are often overlooked—though less now than ever before. Our hope is that we not only introduced some information that can help you as you serve as a Board member, but also that we provided the "why."

From this point, with the information you now have, there are several steps you can take to ensure you're always on top of the intellectual property strategy at your company. We'll provide a checklist at the end to walk you through the process.

In the meantime, ask the management team to produce a dashboard that provides the information management uses to assess the company's overall health, especially as it relates to IP. Don't tell them what questions you are interested in; the purpose of the initial dashboard is to provide you with insight into what management is thinking is important and if and how they are measuring things.

Once they provide the dashboard they believe you want to see, the Board can work with management to include additional information for a broader view. You can now ask the questions we have discussed. What are they working on? What technology are they developing? How much time will these new developments take? What technology should they acquire, whether through portfolio acquisition or through making it? Who else is currently in the technology space? Is the company applying for patents early and often to avoid disruption from competitors? These questions help management and the Board establish an appropriate framework for the company's strategy.

You now know how to determine the strength of your current intellectual property, and how to assess IP you intend to acquire. You're aware of how long various IP strategy decisions can take, making planning for now and for the future easier. You have a Rosetta Stone for your patents so that you can map all of your intellectual property not just to the products you currently produce, but also the technology your competitors own. Lastly, you can now determine if your company's patents are even "good."

We want to reiterate one important point: apply for patents for your research and development early and often. Remember that the first to innovate isn't necessarily the winner anymore; the first to patent that innovation is. Don't let your competitors beat you to the punch and steal years of hard work and millions of development dollars by waiting too long to apply for patents.

We understand that many of the tasks contained within this series require specialized tools—that or months of time dedicated only to analysis. When you reach the point where you need assistance with patent analysis, we're here. We can drastically reduce the time and effort you'll need to spend finding the answers you seek.

IPVision was founded in 2000 by a few MIT faculty members to solve a real problem. The problem? It's something we call…innovation paralysis. In the late 1990's, Joe Hadzima and Dr. Hoo-min Toong were having a difficult time figuring out how to rapidly and effectively commercialize technologies. Before IPVision, understanding patents associated with a particular industry or technology, the intellectual property (IP), and landscape around them wasn't easy.

So, they decided to design their own system to enable them to get better at technology commercialization. They created patent maps and visualizations, proprietary analytics platforms, and after bringing them into a few companies to show them what the technology could do for them, business leaders started asking for more:

- What should we build next?
- What trends should we know about so we don't get "Ubered"?
- Where is the market wide-open and how do we seize the opportunity?
- How can we see what our known competitors are doing…and beat them?
- How can we spot unknown competitors to stop the threat before it happens?
- We're already a top-performer in our industry. How we do stay on top?
- How do we use patent data to plan mergers and acquisitions?

Enter IPVision.

To see how we can help you make your next move, get in touch.