

Corporate Innovation: How to Make Sure Your Ideas Are Viable and Valuable



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MODERNIZING THE INNOVATION PROCESS

In 1970, George Harrison released the hit song, “My Sweet Lord.” The peppy, upbeat jam spent four weeks at number one on the Billboard hot 100, and was the first number one song by a solo Beatle. Unfortunately for Harrison, ‘60s girl group The Chiffons thought “My Sweet Lord” was not so fine with them, deciding that it bore a striking resemblance to their own 1963 chart-topper, “He’s So Fine.”

In the court battle that followed, Harrison claimed to have based the melody on a public domain hymn, but admitted the similarity. The judge ruled it a case of ‘subconscious plagiarism’ and Harrison eventually paid \$587,000 to The Chiffons songwriter Ronnie Mack.

“Parallel thinking” or “subconscious plagiarism” is a well-known phenomenon in creative pursuits—take the story of Robin Williams, who was notorious for “inadvertently appropriating” other comics’ material, and for sending money to the comics he’d stolen from.

Of course, this engineering.com whitepaper is about patents and inventions, not music—but the process and law surrounding the avenues for protection of original works and intellectual property is similar. The problems and strategies are similar, too.

1970 was a prolific year for George Harrison. He released 22 songs on his solo debut album *All Things Must Pass*, one single of which was the aforementioned “My Sweet Lord.” It can be very difficult for artists and creators to avoid subconscious plagiarism. What are the strategies for finding out if a melody or chord progression is sufficiently original? If your own memory doesn’t provide a match, artists are limited to humming or playing the song for someone else and hoping they recognize it.



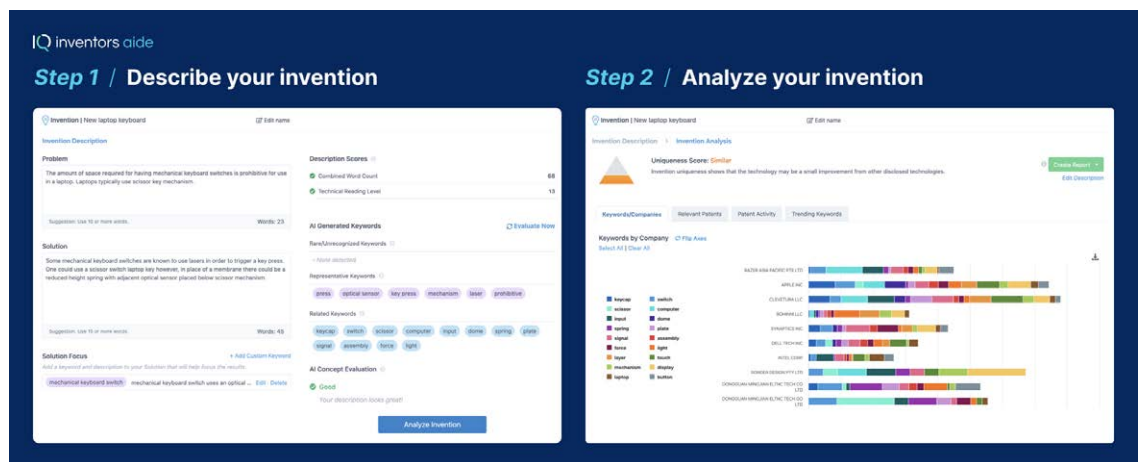
(Stock image.)

For 28 consecutive years at the time of this writing, IBM has led the U.S. in patents. In 2020, IBM scientists and researchers received 9,130 patents. To produce 9,000 patents in a year is a tremendous feat of innovation, engineering and legal work, even for a massive company like IBM. To receive 9,000 patents means that the company must have applied for, conservatively, double that—let’s say, 18,000 patents. Within each application, there may be ten written disclosures. That means 200,000 disclosures.

How can a company like IBM manage tens of thousands of ideas while avoiding “My Sweet Lord” scenarios? If the company uses lawyers to sift through existing patents to identify if an idea is unique, and to write the disclosures that describe each idea, the process will be slow and costly.

This is where IP.com comes in, with their semantic search engine InnovationQ Plus. According to IP.com CTO Sam Baxter, “If we can teach engineers what is and isn’t patentable, part of their process of communicating to their peers helps identify potential patents.” InnovationQ Plus allows engineers and inventors to use a search engine to quickly search for keywords related to an idea and get a sense not only of what exists in the prior art, but also how different similar ideas are connected and the language or jargon related to that idea.

“Being able to describe to a system what I think I’ve invented, and have the software system tell me, ‘No you didn’t invent it,’ that will spur me to be more inventive,” said Baxter.



(Image courtesy of IP.com.)

It seems safe to say that if some musical analogue of IP.com’s semantic search engine existed in 1970 for musical artists, George Harrison would have had the capability to look up his melodic ideas for “My Sweet Lord,” and perhaps write an even better, more original work of art.

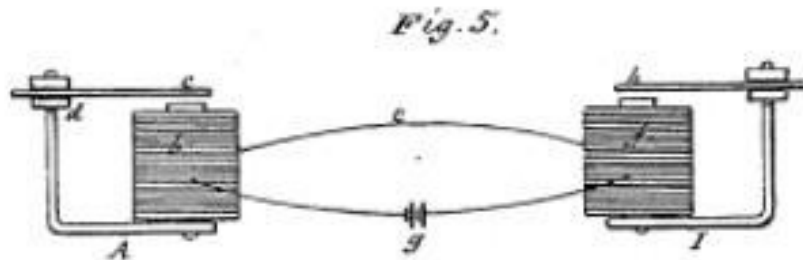
IP.com gives engineers and inventors a new way to access and explore the world of existing innovation and filed patents. This paves the way for a better understanding of what has been invented. The effect of this access to knowledge is like the lifting of a fog: empowered with knowledge, engineers and inventors are more free to innovate.

In this whitepaper, we’ll explore the innovation process, empowered by InnovationQ Plus. With the fog lifted, it’s an exciting time to be inventing.

IDENTIFYING AND EVALUATING PATENTABLE IDEAS

A drawing included in Alexander Graham Bell's original patent for the telephone. Claims from the document: "I desire here to remark that there are many other uses to which these instruments may be put, such as the simultaneous transmission of musical notes, differing in loudness as well as in pitch, and the telegraphic transmission of noises or sounds of any kind."

(Image Source: US Patent 174465.)



Witnesses
E. W. Hatch
H. J. Hutchinson

Inventor:
A. Graham Bell
Wm. S. Gray

What is a patentable idea? And once you have one, what should you do with it?

Fundamentally, intellectual property law is intended to protect and encourage new, useful and inventive ideas. According to the U.S. patent and trademark office (USPTO), patent protection can be granted via a utility patent for a new, nonobvious and useful:

- Machine.
- Composition (for example, the chemical composition of a lubricant).
- Article of manufacture.
- Process.
- Or for an improvement on one of the above.

In addition to utility patents, the USPTO will also patent ornamental designs for one of the above, or for certain plant varieties. The USPTO also sets out a list of what cannot be patented. These include:

- Laws of nature.
- Physical phenomena.
- Abstract ideas.
- Literary, dramatic, musical and artistic works. (These can be Copyright protected through the Copyright Office.)

- Inventions which are:
 - Not useful (such as perpetual motion machines); or
 - Offensive to public morality.

Inventions must also be, according to the USPTO:

- Novel.
- Nonobvious.
- Adequately described or enabled (for one of ordinary skill in the art to make and use the invention).
- Claimed by the inventor in clear and definite terms.

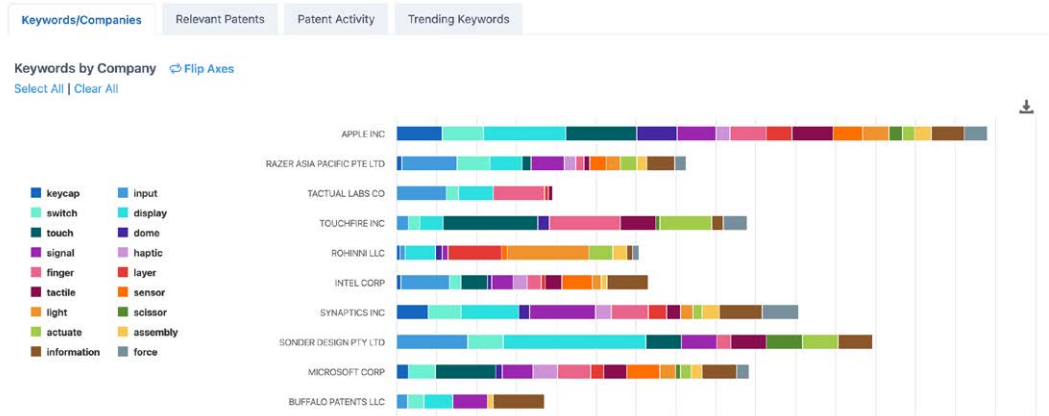
If your invention has already been publicly disclosed by another inventor, it is not patentable, either. This is where much of the litigation around patent infringement occurs. Whether or not another idea infringes on an existing patent depends largely on the wording of the claims of the patent. This is why it is important to create patents carefully and with sufficient research of the prior art.

A prior art search is recommended by the USPTO before filing a patent. According to the USPTO website, “A registered attorney or agent is often a useful resource for performance of a patentability search. After an application is filed, the USPTO will conduct a search as part of the official examination process. Conducting a thorough patent search is difficult, particularly for the novice. Patent searching is a learned skill. The best advice for the novice is to contact the nearest [Patent and Trademark Resource Center \(PTRC\)](#) and seek out search experts to help in setting up a search strategy.”

This is the key strength of IP.com’s semantic search. According to Baxter, the company developed a “very high function retrieval engine, which we call Semantic Gist, that is particularly good at retrieving technical material and seeing through language boundaries such that current technical material and patents are an absolutely natural fit.”

With a natural language search that can index prior art better than existing methods, seeing through the different contexts and jargon terms of different industries and applications, inventors have a better resource for finding similar ideas rapidly and thoroughly. Not only will this make the process of determining which ideas to pursue more efficient, but it can also help determine the boundaries of an idea, and the best wording to use that will maximize the value of a disclosure.

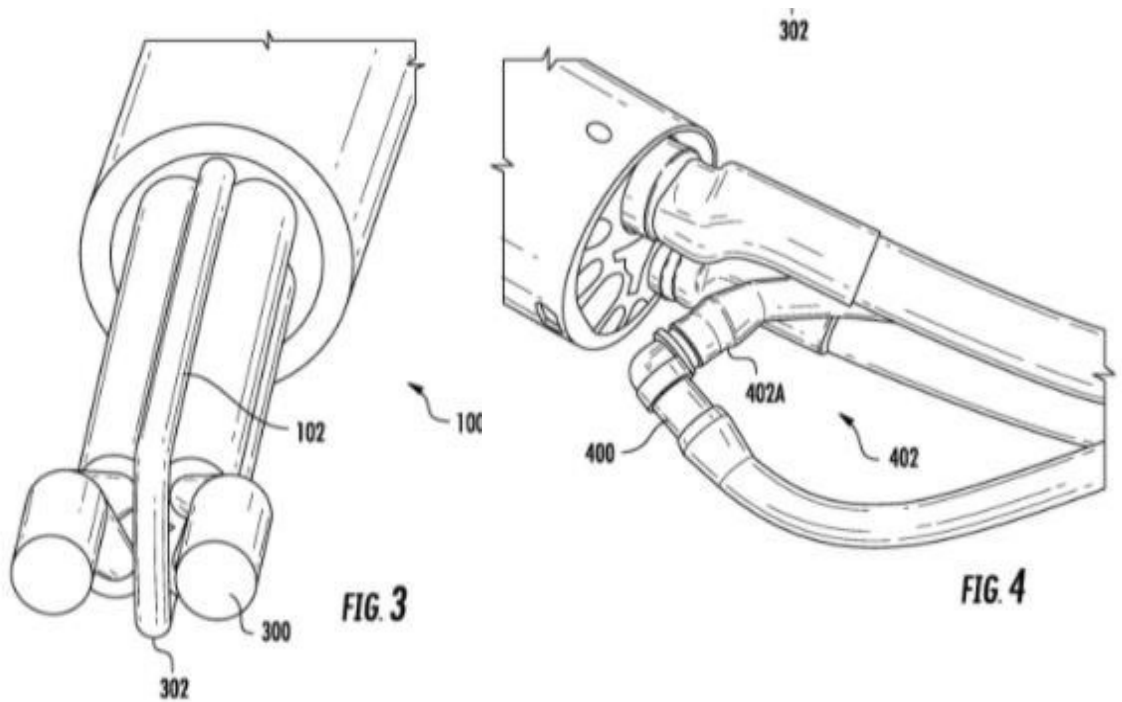
For example, according to Baxter, IP.com worked with one customer in the automotive space who was working with the concept of a Frunk. Through prior art search, they determined that the term ‘frunk’ was not used in the prior art literature, and so it was decided that ‘front trunk’ would be more effective wording.



(Image courtesy of IP.com.)

Similarly, semantic search can surface results from other industries that may have certain relevant parallels. One example could be a patent for a printing process using controlled nozzles to jet ink. In a traditional prior art search, it might be very difficult to locate patents for an agricultural sprayer, for example, which discloses a similar process. IP.com’s semantic, natural language search can make connections and return relevant results, adding value to the search and informing a better patent application.

For all inventors, from large commercial entities to individual makers, there is also an important strategic decision to be made once a patentable idea is found. By definition, patenting an invention describes it to the world. This may put you at risk of infringement or theft of the idea—especially from entities in other countries, outside the jurisdiction where you have obtained legal protection. For this reason, some inventions are better protected as trade secrets. The risk of a trade secret, however, is that if a competitor does discover the secret, they could potentially patent it themselves.



In 2016, Tesla was granted Patent # 11,084,390, this liquid-cooled charging connector.

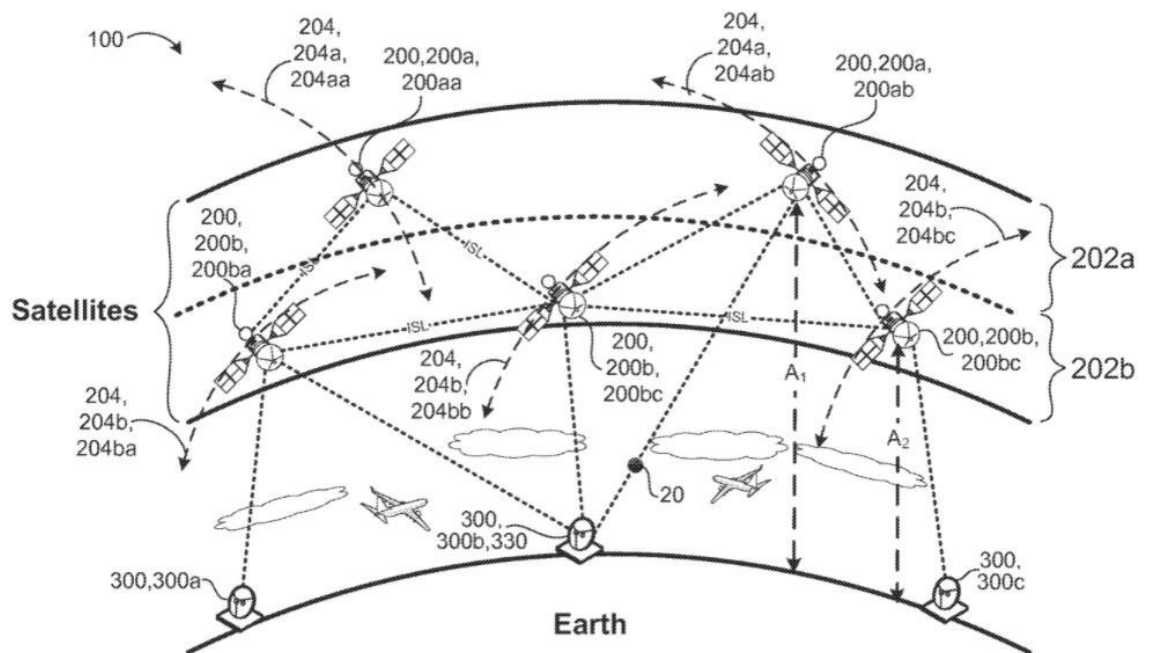
(Image Source: US Patent # 11,084,390.)

A third option is to place an idea in the public domain. For many ideas, holding intellectual property protection is not as valuable as simply being first to market. According to Baxter, this can be common in the software and app development industries. Publishing an idea prevents competitors from monetizing the idea, and ensures you will be able to continue using it, without the legal difficulties or costs of maintaining a patent.

The best strategy for protecting an idea depends on both the company and the idea. For example, in 2014, Elon Musk made Tesla’s patents available for anyone to use for free, stating that “technology leadership is not defined by patents.” In 2019, Musk announced again that he had released all of Tesla’s patents, promising the company “will not initiate patent lawsuits against anyone who, in good faith, wants to use our technology.”

On the other hand, Musk has also relied heavily on trade secrets to protect IP at Tesla, and especially at SpaceX. SpaceX has received patents on ideas such as antennas, satellite constellations and metal honeycomb material, but no patents on its innovative jet engine or rocket designs. In 2012, Elon Musk said, “We essentially have no patents in SpaceX,” explaining that he did not want China to use SpaceX published patents “as a recipe book.” So, at least in Elon Musk’s world, there are merits to each approach.

While SpaceX does own some patents, such as the communication system including a constellation of satellites described by this drawing, much of the company’s technology is protected only by trade secrets. (Image source: US Patent 9647749B2.)

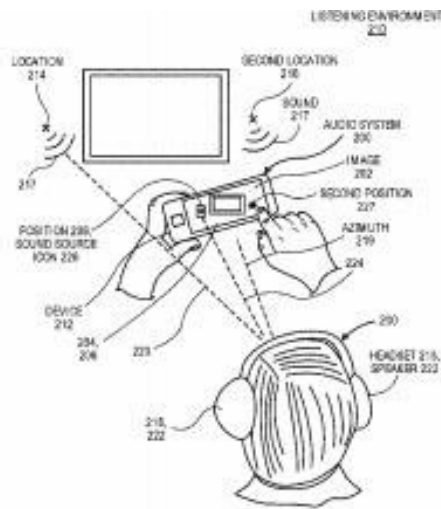


VALIDATING INNOVATIVE IDEAS AGAINST THE COMPETITIVE LANDSCAPE

Now we understand what constitutes a patentable idea and why it is important to conduct prior art research to draft the best possible wording in the disclosures. IP.com's InnovationQ Plus search engine, powered by the company's Semantic Gist technology, puts that power at the fingertips of engineers and inventors at companies such as IBM and Black and Decker.

Monitoring and researching the patents of competitors and key industry players is an essential part of competitive intelligence strategy. This drawing is from a patent granted to Apple, inc, for "method of using the audio system to augment spatial audio rendition." Other players in the smartphone market keep a close watch on Apple's patents, especially as the pace of innovation in the smartphone market is so fast.

(Image source: US Patent 11,102,578)



Competitive intelligence is an important part of the invention process. As discussed in the last section, reviewing the most relevant and similar patent applications to your own can help you compose claims that provide the best value for your patent.

“When you read claims, they may be difficult to parse because of the legalese, but the body of the document is rich with conceptual associations and context that can be mined by our machine learning algorithms to understand what these patents are trying to accomplish. It also allows us to see through the boundaries of technologies,” said Baxter.

InnovationQ Plus can also be used to monitor the patent literature produced by competitors, which can provide a better understanding of where innovation is moving in your industry, and help identify market disruptions quickly.

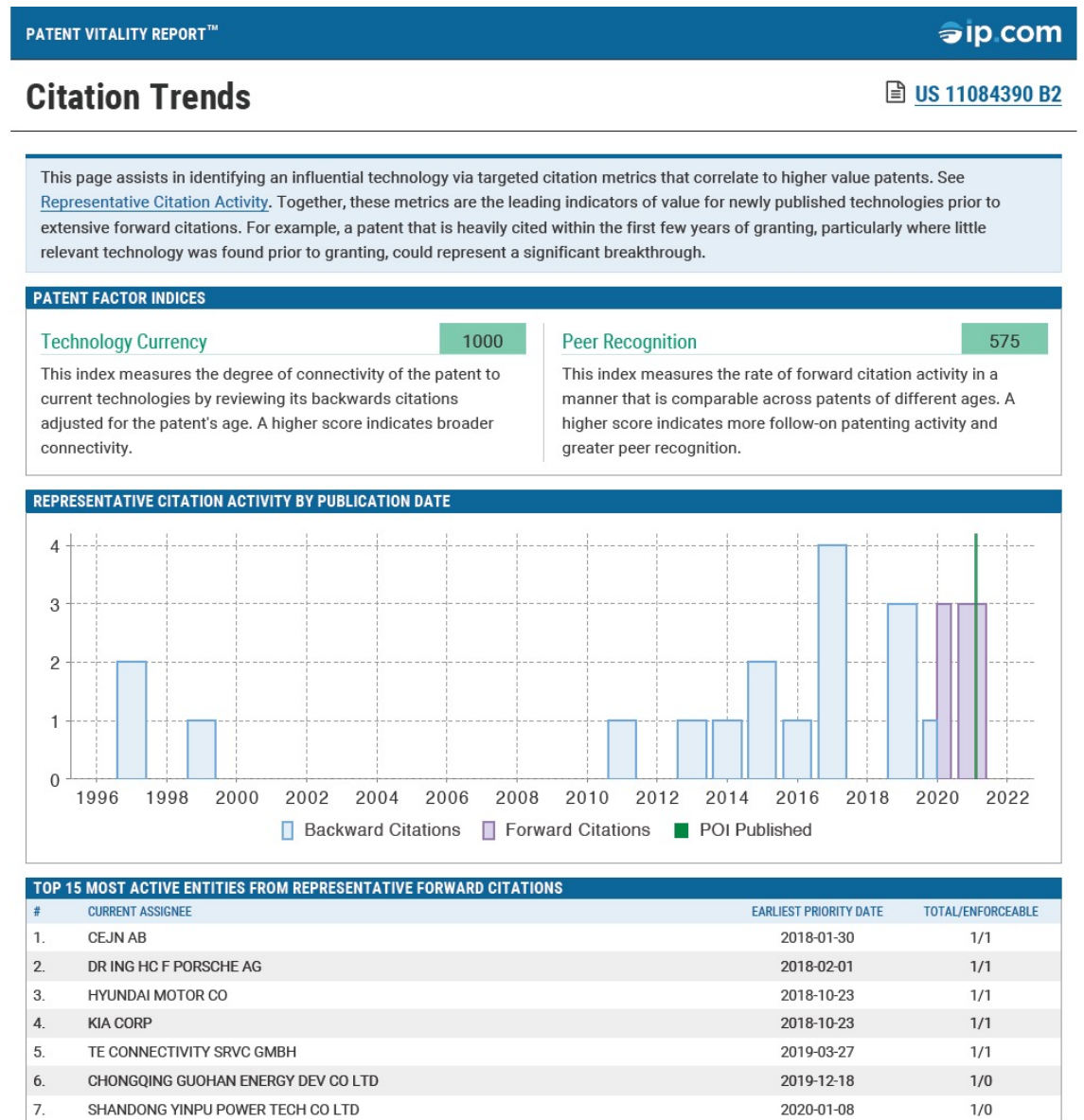
The InnovationQ database indexes millions of pieces of patent literature, including collections from the five major patent offices including the U.S. (USPTO), Europe (EPO), Japan (JPO), the Korean Intellectual Property Office (KIPO) and the National Intellectual Property Administration (CNIPA, formerly SIPO) in China.

(Image courtesy of IP.com.)

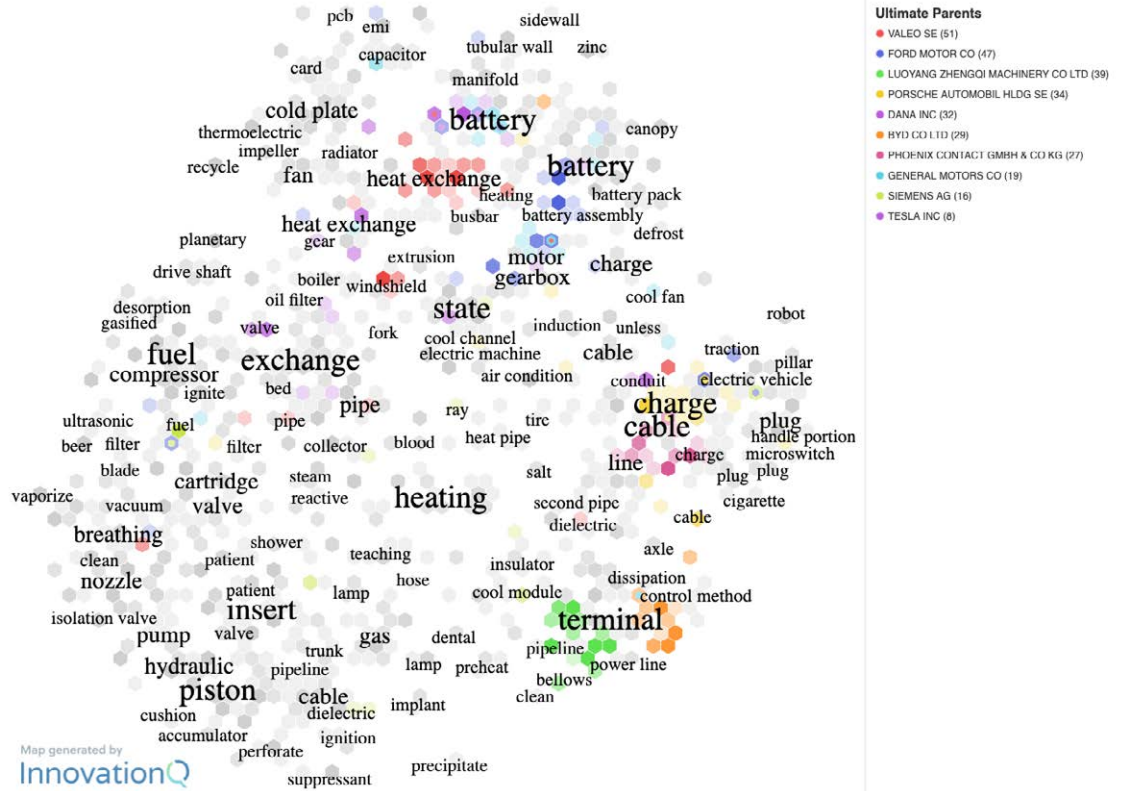
“In addition, we’ve got a deep library of non-patent and technical literature that we add to continuously,” said Baxter.

InnovationQ also indexes IEEE literature. “We may be the only company that receives full text from the IEEE that we can use for indexing, and therefore we’re pretty much the only platform in the world that does any form of semantic indexing on full-text IEEE literature,” Baxter added.

According to IP.com, InnovationQ Plus is the only patent search tool that features exclusive, fully discoverable content from IEEE, including full-text journals and conference papers alongside one of the largest global patent databases in the industry. IEEE is the most up-to-date source of scientific and technical literature in the world, and is cited three times more than any other technical source during patent prosecution.



(Image courtesy of IP.com.)



(Image courtesy of IP.com.)

How does IP.com’s Semantic Gist engine, which powers InnovationQ plus, work to index hundreds of millions of documents and return them based on relevance to a user query? According to Baxter, the machine learning system uses categorization to assign each document based on connections it makes to keywords that appear in the document. The neural network creates a web of categories.

“For every document in the system, we end up with a vector of about 150 ideas, and a relative weight of how much each of those ideas applies to a particular document. The best way to explain this is to forget about 150, and think more about four. So, if you have earth, air, fire and water, and those are your four vectors—your four buckets—then you want to describe every document in terms of those four things: earth, air, fire and water,” Baxter explained.

“If you were describing a fish tank, you would say it’s largely about water. It’s a bit about earth, because of the glass and the gravel at the bottom. There is some fire involved, because there is probably a heater. If we were describing a garden, we might categorize that as primarily about earth, and there is certainly some water, but we really have very little fire involved in gardens. And of course we need air, probably in a greater proportion than water. So, you can see how you get a vector which describes those things, and we use this deep Machine Learning Network to boil things down into categories.”

Using InnovationQ Plus can help engineers and inventors find relevant pieces of literature to review during their innovation process faster—with greater breadth and deeper access to the full body of work available across the globe than what is traditionally possible in a patent library.

DRAFTING BETTER DISCLOSURES

For a team developing a new product, prior art research plays an essential part in many stages of the process, including brainstorming, competitive and market intelligence, both technical and ornamental designs, and IP protection strategy.

(Stock image.)



Let's look at an example of how IP.com's semantic search can inform an engineer or inventor's innovation process. In our example, an inventor for a large sporting goods company is looking to begin development on a new bicycle accessory: a device which attaches to a bicycle to equip it with an electric motor.

"You could start in our software, simply by typing 'electric bike,'" said Baxter. Because of the way the Semantic Gist engine categorizes documents by concept reduction, this simple search will make connections to concepts such as bicycles, motorcycles, batteries and electric motors. "The search will take that very generic query and show you what is conceptually related to it in a two-dimensional diagram. The result of that is this kind of clustering, so you're likely to see things; because you said electric bicycle, I would be surprised if you didn't see a cluster of documents about batteries," said

Baxter. "So, this can provide a brainstorming tool for inventors, allowing inventors to take the idea that you're expressing, and run it through the patent database to find the concept terms related to your ideas."



(Stock image.)

After brainstorming, the inventor in our example may believe they have an original idea for their bicycle accessory product. The next step is to measure and understand the uniqueness of the idea to determine the potential value in patenting and pursuing it. IP.com uses packaged algorithms to assess and compare ideas to the existing literature and provide a score.

“We apply a number of semantic and bibliometric measures to your idea, as you’ve expressed it, and we try to analyze it in some kind of economic context: Are big companies patenting ideas related to this, or are little companies? Are older companies patenting ideas about this, or are newer companies patenting ideas about this?” Baxter said.

In addition to these bibliometric measures, the software also uses its categorization capabilities to evaluate just how different your idea is from existing ideas in the space. “If your idea intersects closely with a lot of other documents, then your idea is probably not terribly unique. But if your idea stands apart because it’s a unique combination of concepts, then your idea has a shot at being unique. We take all of those measures and bundle them into one number and that number helps rate uniqueness,” explained Baxter.

A patent must be classified in a variety of ways, depending on which country’s patent office you are filing with. Obtaining a better understanding of the prior art literature can help properly classify your idea.

In this way, the search engine can give inventors an understanding of which ideas are unique enough to pursue, or whether they are better off pursuing other avenues (just like our “My Sweet Lord” analogy back at the beginning of this story). However, the search engine can also provide value when drafting the wording of the claims of a patent application.

“Another thing we can do with the patent database that is very interesting is that we can determine whether you are using common terminology. Every company has their own kind of vocabulary that they use to describe things, and it tends to be rife with acronyms and jargon,” explained Baxter. “It can be hard to get away from those things when you’re embedded in the culture of the company, but our software can flag those terms for you and help you draft better, crisper claims.”

The patent process has remained largely unchanged over the decades, but by applying neural network and machine learning technology to analyze and categorize the body of prior art literature, IP.com’s InnovationQ Plus search engine is bringing aspects of the process into the 21st century.



Click here to learn more or see [InnovationQ Plus](#) in action.

Also check out [Guided Ideation](#) and [Novelty Scoring](#) tools and more at [ip.com](#).

