Clarivate™

What stories can IP data tell?

Unlocking insights from patent, trademark and litigation data

The power of storytelling with IP data

As business leaders make decisions regarding investments in new products and services, they want to see clear signals and trends to help validate market acceptance and competitive advantage. A rich, yet often untapped, source of innovation and business insights can be found in intellectual property (IP) filings and related data. The strategic interrogation of IP data can unlock a wealth of valuable insights to a multitude of knowledge workers – from innovators, scientists and engineers to in-house and law-firm attorneys, to marketing teams and the C-suite. Applying established data science principles to IP data can effectively tell stories that drive specific business outcomes.

In this white paper, we explore how IP data – including patent, trademark and IP litigation data – can reveal insights to inform a range of business-critical decisions.

What do we mean by IP data?

Intellectual property data comprises information assets involving the creations of the mind, including inventions, literary and artistic works, and symbols, names and images used in commerce. Examples of these assets include trademark and patent filings, applicant and owner information, opposition records, patent/trademark office (PTO) actions, and litigation filings and decisions. In addition, scientific literature and engineering documents on which innovations are based represent another type of meta data that can be valuable in assessing which can be used to validate or invalidate the potential value of innovations.

There is a tremendous amount of IP data to consider. Between 2015 and 2020, there were 18.9 million patent filings, 77.4 million trademark filings[1] and 1.2 million IP-related cases globally.[2]

Conventional uses cases

When considering the use cases of IP data, at the highest level there are two broad categories: tactical, analyzing data to mitigate risk and protect IP; and strategic, using IP data to drive discovery, planning and commercialization of innovations.

Traditional, well-defined examples of both tactical and strategic uses cases for IP data include:

- Monitoring technical developments
- Mitigating IP risk
- Predicting legal outcomes
- Informing business development
- Determining and monitoring value
- Validating investment opportunities
- Monitoring companies and markets
- Identifying novel concepts

[1] Source: World Intellectual Property Indicators 2021, WIPO (https://www.wipo.int/publications/en/details.jsp?id=4571)
[2] Source: Darts-ip

The approach you take should be driven by the business question. This may sound obvious, but it is often missed, leading to insights that are misunderstood. The key to being a good "data storyteller" is having a focused understanding of the question you are trying to answer. In some instances, a very precise approach is required, with little tolerance for "noise." Other cases may require casting a wider net to surface emerging trends. Data practitioners often combine a 500-foot view with a five-foot view to identify macro trends that often require a granular classification of technical concepts.

Challenges of extracting insights

Deriving actionable insights from IP data presents its own set of challenges and hurdles. IP data assets are legal documents written with very specific technical and governance language. While they contain insights as to the value they protect, the problems that they solve (patents), and the labels they protect (trademarks and domains), much of the motivation behind the asset is hidden in unstructured text, in sometimes cryptic prose, in different sections within different types of documents. This makes comparative analysis of multiple IP assets difficult.

Business drivers are often not discussed explicitly in IP records. Key business insights must be derived by relevant metadata associated with IP assets or inferred through association with alternative data sources correlated to IP asset events and parameters. The intent of IP asset creation is very difficult to assess with any single IP asset document or record. They can be a part of both offensive and defensive strategies and, again, this may not be explicit.

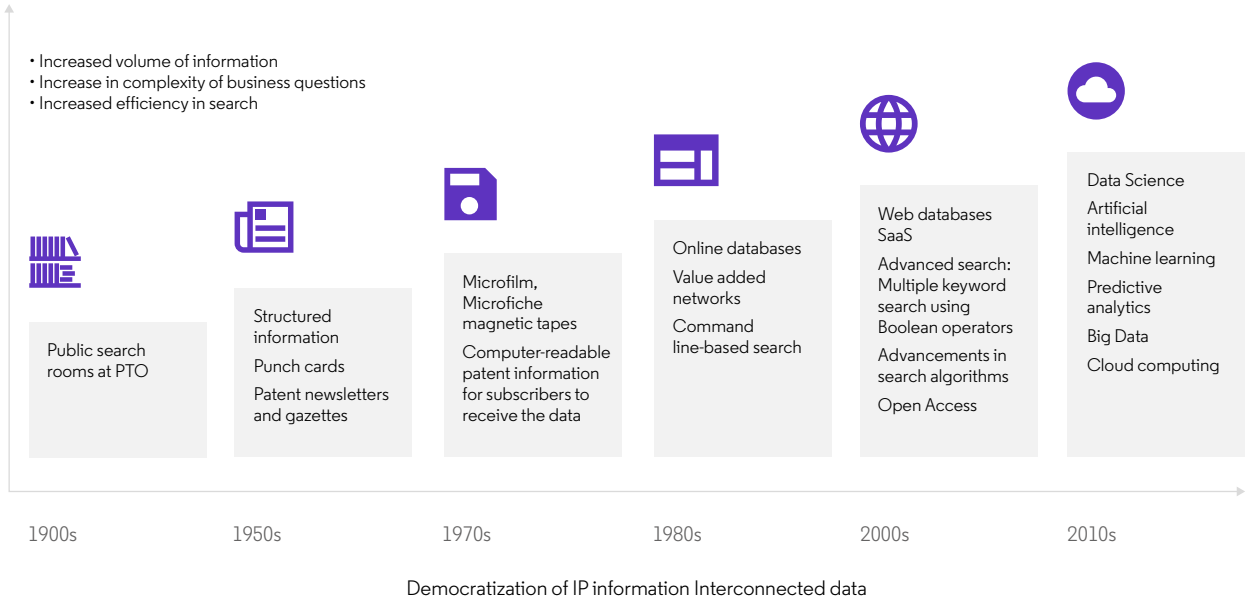
These and other realities make extracting useful insights from IP a complex challenge – one that requires the right technology and expertise.

The role of technology

Historically, access to IP data has been limited to two privileged groups within organizations: legal professionals, who require the data to manage IP risk and protect the company's IP; and data specialists, responsible for gathering, analyzing and reporting on the data. For everyone else, exposure to IP data has been limited, indirect or intermittent.

In today's data-driven business environment, limiting access to IP data in this way no longer makes sense. Forward-thinking organizations look to empower more of their knowledge workers with IP data so they can make better decisions and respond more quickly and effectively to market opportunities and risks.

Figure 1: Technology progression and its impact on IP search.



This data democratization is made possible through advancements in data analytics technologies, such as machine learning and natural language processing, making it easier to search, analyze and report on IP information.

Enabling next-generation use cases

So what kind of actionable intelligence can technology enable us to extract from IP data today? We see four key categories of "next-generation" uses cases:

- **Macro trends** – Analyzing big data to uncover hidden patterns and unknown correlations that can indicate important trends.
- **Predictive analytics** – Moving beyond descriptive analysis, filling in the gaps to identify future probability based on historic data.
- **Commercial lens** – Delivering more commercially relevant insights and those that align to corporate strategy to generate value.
- **Smart data** – Leveraging interconnected IP data in combination with adjacent, commercial data, such as financial information, to derive valuable insights.

To illustrate how IP data can open new doors of understanding, let's consider some real-world examples.

Figure 2: Visualization of innovation trends in specific industries, with the ability to show changes over time.

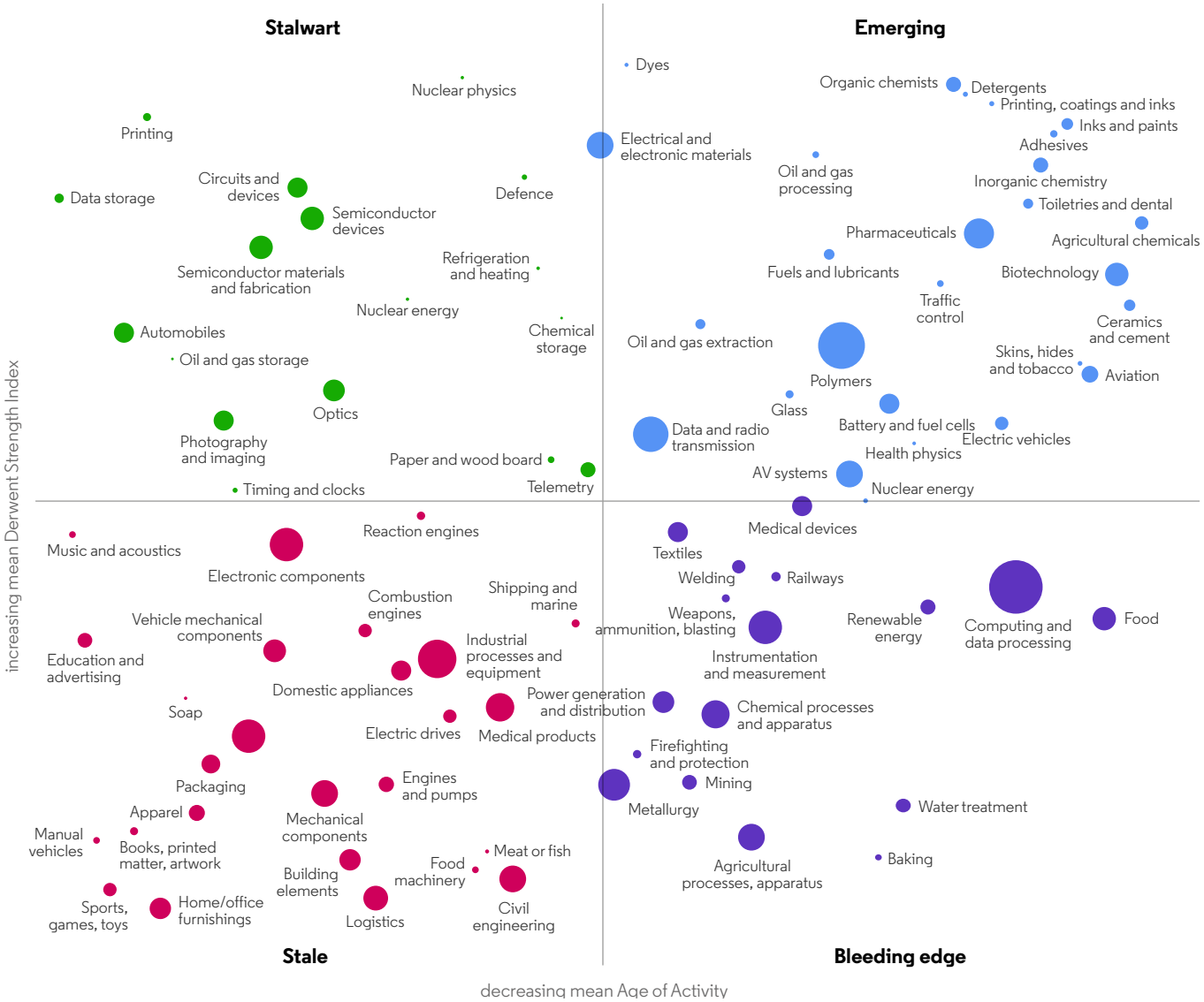
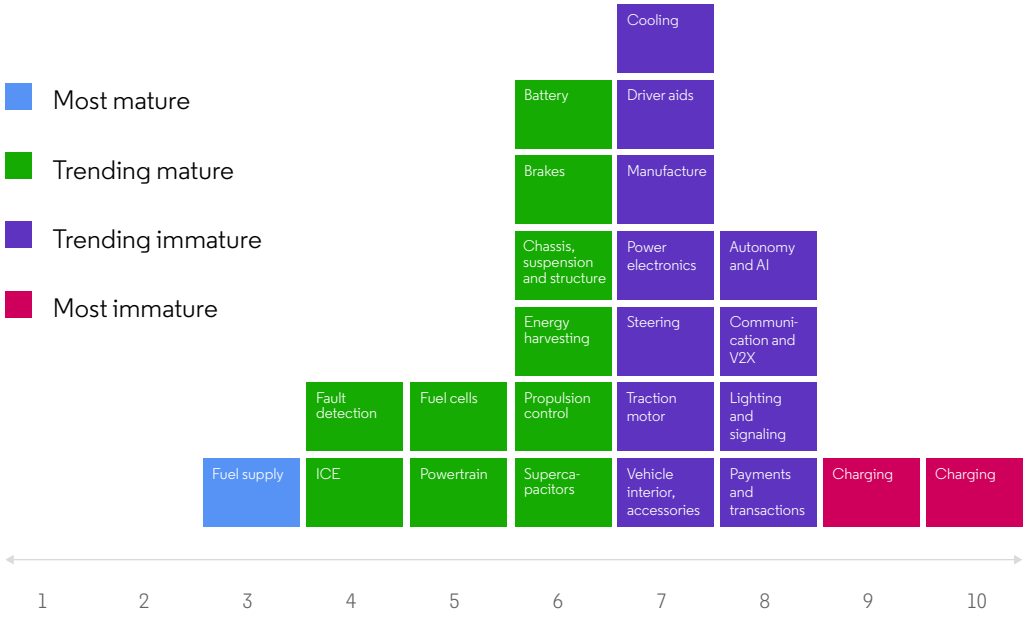


Figure 3: Predicted s-curves for high-growth topics (left) and low-growth topics (right). Cumulative number of inventions, including predicted value to 2024.



Macro trends:
Embracing big data

By looking at a decade of patent data and all the associated metadata and supporting data and analysis, we can analyze more than 23 billion rows of data to create a modeled visualization (see Figure 2).

This visualization exposes some interesting narratives highlighting the changing roles of enabling technologies driving innovation efforts in key industrial sectors over time.

The dots represent specific technologies, with the size of the dots reflecting the level of activity. We can see which technologies are standing out, in a useful context. What is the value being created? When is it created? Who does it impact? How is it impacting them?

Applying data science techniques to very large, unstructured datasets, we can create a model to objectively measure the strength and impact of these inventions, benefits and technologies. Viewing this over a period of time, patterns begin to emerge that expose interesting stories about where new ideas are flourishing, where technologies may be moving from maturity to obsolescence and where immature technologies are gaining traction, among other insights.

This can inform decisions about where to make strategic investments – and when.

Models like this show the exciting value of big data analytics and data visualization to assess macro trends.

Predictive:
Moving beyond descriptive

We can also use IP data to move beyond what has already occurred and reveal a predictive view of what may occur in the future. In the example shown, we're looking at the increasing value of a specific technology (electric vehicles, in this case) within various inventions (see Figure 3). This value could be the level of innovation, economic value derived, technology adoption, or another metric.

The figure shows distributions, both descriptive and predictive, of cumulative inventions over time from when their patents were filed. It provides an interesting narrative about how systems evolve, a capability maturity model that focuses on how much time does it take to increase the value of a technology in specific applications. In this example, it takes a fair amount of time before we see significant headway. Then, suddenly, there is an inflection point and a rapid spike

in value, following by a flattening as it reaches maturity. This is known as an s-curve growth model.

Using this modeling technique with large IP datasets, we can apply rigorous statistical analyses to anticipate predicted s-curve trajectories. This can help us understand not just what is happening now with the technology in specific industries, but also where those stories are likely to go in the future. Of particular value is the potential to predict where there may be a divergence from the expected trend, not just in a market of interest but also in adjacent markets.

Commercial lens: Focus on outcomes

Of crucial value is the ability to leverage these analytical, descriptive and predictive insights and apply a commercial lens to assess their real-world business impact. In the example shown, we're looking at invention volume versus predicted volume growth (see Figure 4).

The blue dots indicate areas of relatively low focus by the organization but with high predicted growth. The teal dots indicate areas of high focus but lower predicted growth. The

Figure 4: Meta focus and alignment to metaverse technology growth.

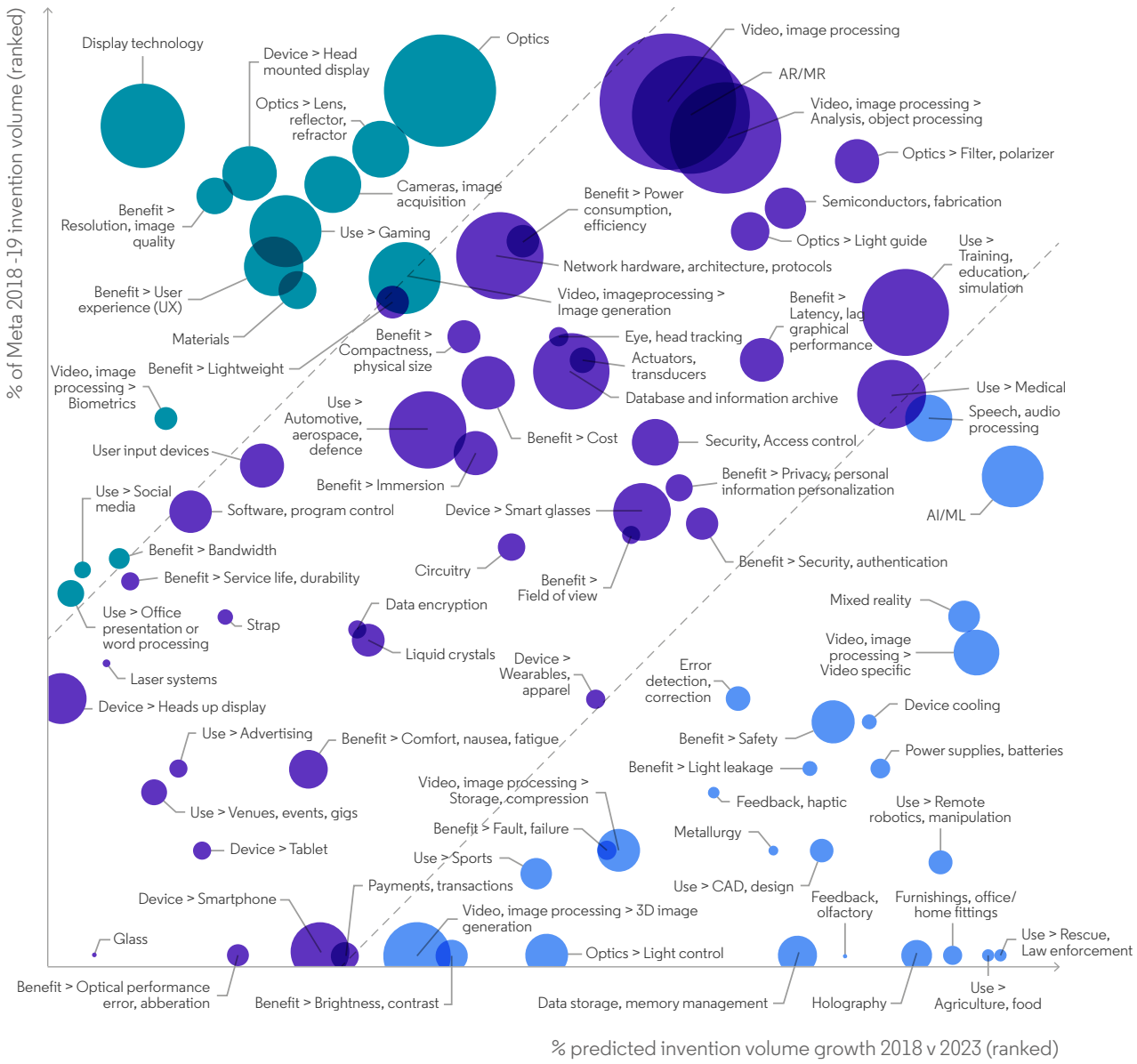
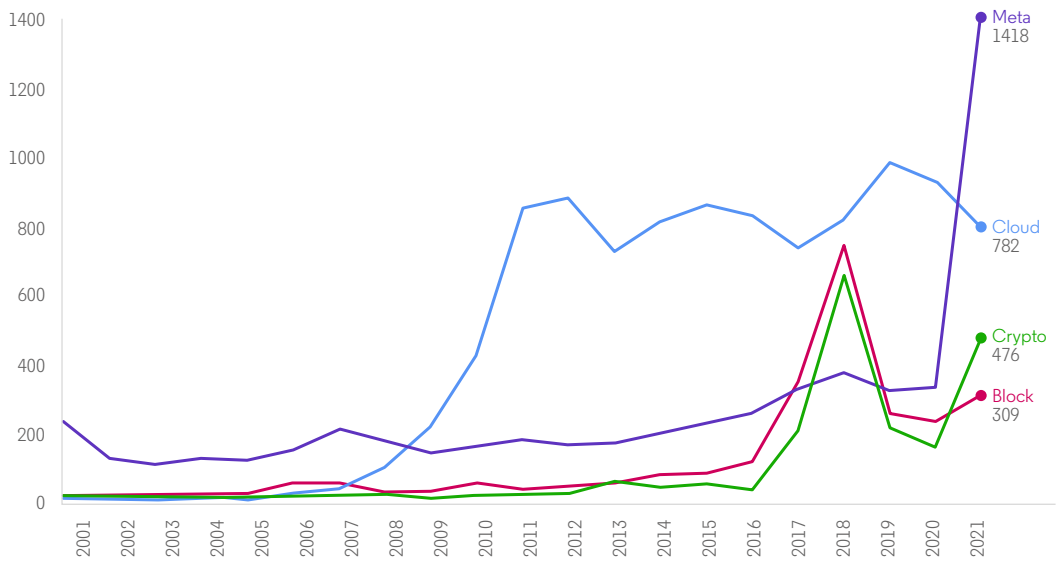


Figure 5: Trademark filing trends over a 20-year period for the U.S., Europe and China.



purple indicates where there is convergence between high focus and predicted growth. This provides a fascinating visualization, enabled by s-curve modeling, to support strategic analysis of areas of potential focus.

This type of analysis acts as both a decision tool and a prescriptive diagnostic tool highlighting the alignment with or variance from trends. This is tremendously valuable information to help inform or validate decisions regarding strategic investments or divestments.

IP data isn't just valuable for analyzing commercial trends for inventions; it can also be helpful for understanding branding trends. Looking at an analysis of trademark filings. The example here (see Figure 5) shows trend lines for trademark filings that include the four terms shown over a period of 20 years. We see some very dramatic changes over time – such as the sudden spike for trademarks including "crypto" and "block" around 2017 to 2018, as cryptocurrency and blockchain entered the public consciousness. In 2021, "meta" spiked, reflecting the new

Figure 6: Number of trademark filings containing specific technology terms over a 20-year period.

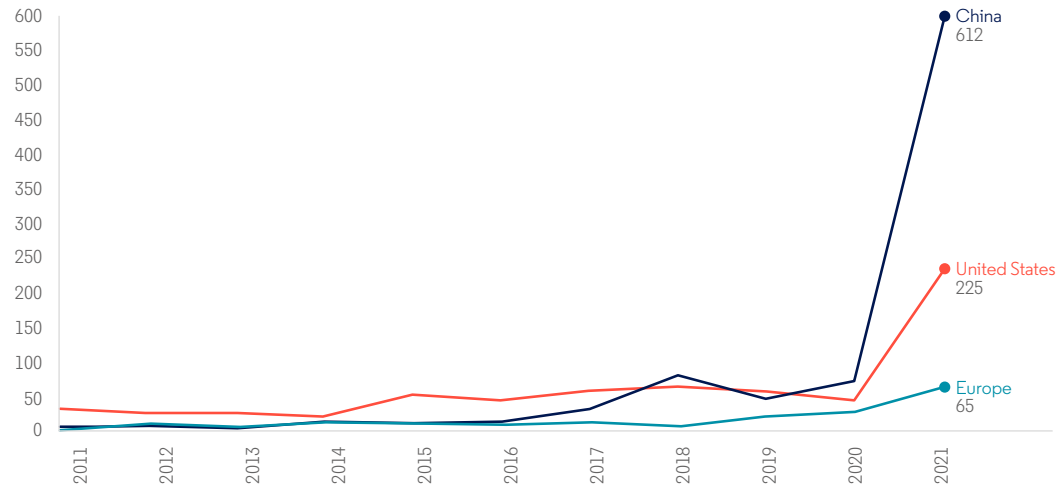
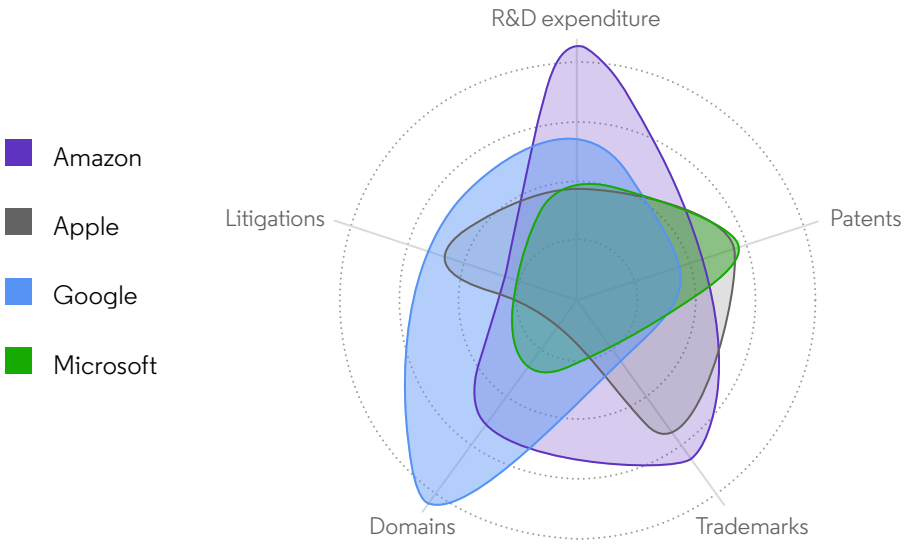


Figure 7: Comparative view of R&D expenditures; patent, trademark and domain portfolios; and IP-related litigation for four well-known companies.



corporate name for Facebook. This visualization illustrates dramatically how new technology adoption can impact brand strategies as companies seek to align with popular tech terms.

We can slice this data a different way, looking at trademark filings through a regional lens. The visualization shown illustrates filings for the term "meta" for all product and service categories over a 20-year period (see Figure 6). While activity begins to increase at the time Facebook introduces its new corporate name, beginning with the U.S., filings in China rapidly overtake other regions and head for the stratosphere.

This raises a host of intriguing questions. Who is behind these filings? Does it represent a defensive or offensive brand strategy? It certainly speaks to significant interest and perhaps the need to follow up with additional investigation to inform a brand protection strategy.

Smart data:
Leverage interconnected data

We can also analyze interconnected data from different sources to create a multidimensional view of a company's innovation. In this example, we interconnect and analyze data on R&D expenditures; patent, trademark and domain portfolios; and IP-related litigation for four well-known, innovative companies (see Figure 7). The resulting radar plots provide a visualization of their respective strengths and potential vulnerabilities.

When we superimpose these radar plots, we now have a fascinating comparative view. It provides a basis for better understanding how companies are performing around parameters that are important to you – including potential areas of both risk and opportunity. It can also help illuminate insights about the performance of a particular sector in which the compared companies compete.

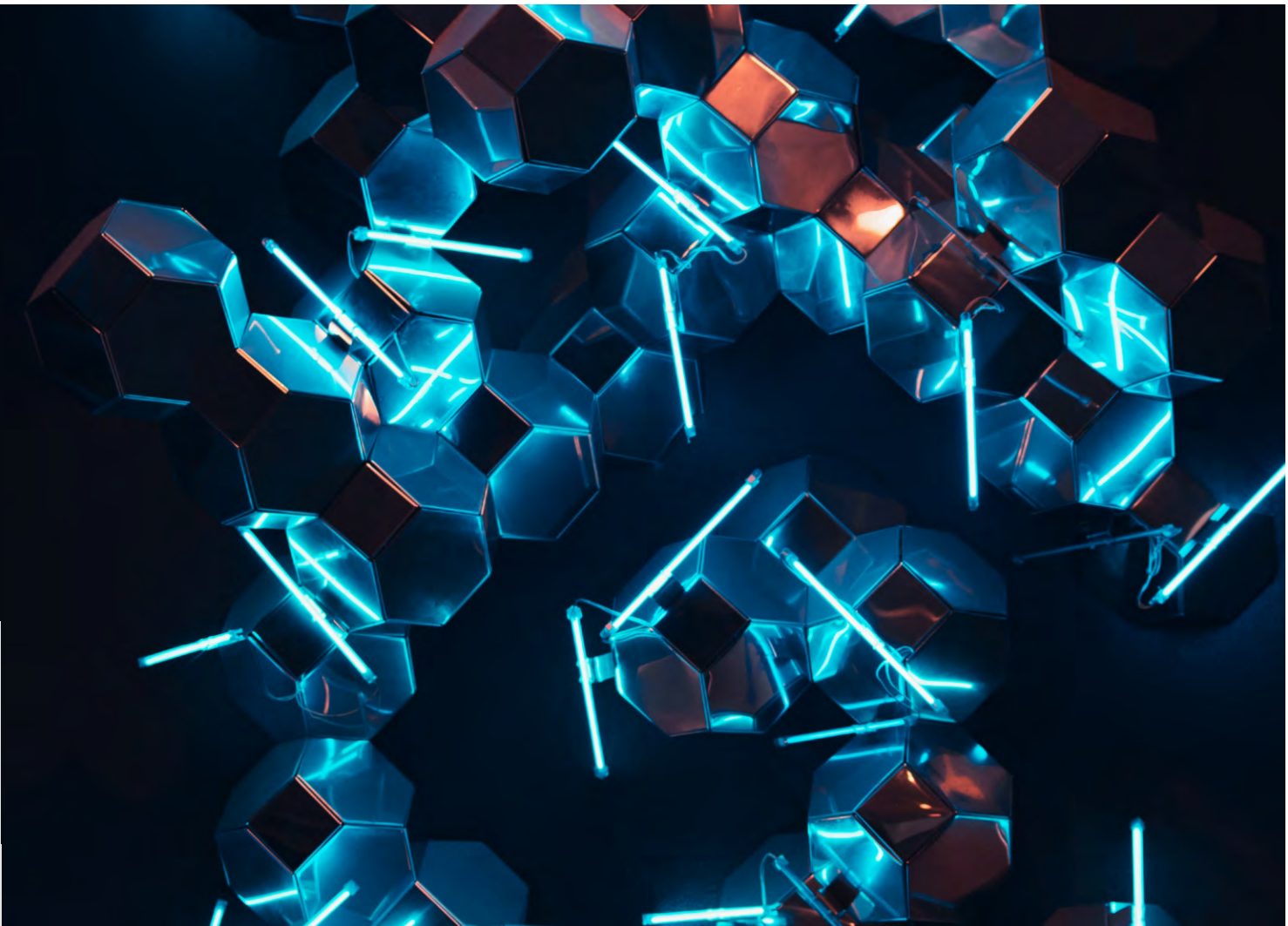
Maximizing the power of data

The examples featured in this white paper are just that – examples. There is virtually no limit to the types of parameters that can be analyzed to meet your specific need or inquiry. A key factor is having contextually relevant data that has been cleaned, normalized and structured to enable effective analysis.

It's also important to recognize the importance of combining quantitative analyses with qualitative approaches, benefiting from those with deep subject matter expertise, either within your organization or working with an outside partner. Coupling these two approaches to validate each other is truly where the power is.

Converting IP knowledge into action is easier said than done. It requires the right infrastructure of people, process, data and technology. But when done correctly, IP data analysis can unlock a treasure trove of valuable business insights that may just give your company an edge.

To learn how IP data can help answer your critical business questions, contact Clarivate today.



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About Clarivate

Clarivate™ is a global leader in providing solutions to accelerate the pace of innovation. Our bold mission is to help customers solve some of the world's most complex problems by providing actionable information and insights that reduce the time from new ideas to life-changing inventions in the areas of Academia & Government, Life Sciences & Healthcare, Professional Services and Consumer Goods, Manufacturing & Technology. We help customers discover, protect and commercialize their inventions using our trusted subscription and technology-based solutions coupled with deep domain expertise. For more information, please visit clarivate.com.

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