



**LOTNETWORK**

produced in  
association with



**CIPHER**

# LOT Network Report 2020

Why the largest portfolio in the world reduces  
risk from Patent Assertion Entities

October 2020



**LOT Network members own**

**2.7m+**  
patent assets including over

**12%**  
of all US granted patents

**What do IBM, Xiaomi, Olympus, China UnionPay, DJI, Shutterfly, AirBNB, S&P Global, Continental, Coca-Cola, Royal Bank of Canada, Charter Communications, Mercari, Delta Airlines, Citizen Watch Company, BNY Mellon, Transamerica, Geely and Best Buy have in common?**

- A. They are all world class companies**
- B. They take steps to maximise the value of their patents**
- C. They have reduced the risk of PAE litigation**
- D. They joined the LOT Network in 2020**

**The answer is all of the above.**

LOT Network was formed in 2014 as the corporate solution to the patent assertion entity (PAE) issue. In six years, LOT has grown exponentially with over 425 companies joining in 2020 alone and now counts over 1,000 members in its community. All LOT Network members sign the exact same agreement that preserves the traditional uses of patents, yet grants a license to the other members if, and only if, one of their patent assets ever falls into the hands of a PAE. Since formation, the aggregated portfolio captured under the LOT Agreement has grown to over 2.7 million active patent assets. As a result, LOT Network members have become immunised to the world’s largest high-tech patent portfolio should any of those assets ever be transferred to a PAE.

While the growth of LOT Network is unprecedented, so too is the economic impact of the global pandemic. Covid-19 has triggered a recession that will likely increase the number of patents available for purchase by PAEs which in turn will inevitably lead to more litigation.

This Report is published with the support of Cipher, who is responsible for tracking the patent portfolios of the 1,000+ LOT Network members using their leading strategic patent intelligence platform and Richardson Oliver Insights, who produce regular reports on the secondary patent market. It presents evidence that is compelling and irrefutable. The convergence of technology has only increased the total addressable market (TAM) for PAEs, and with the larger number of assets that are on the market for sale, PAEs are confident they can acquire assets and still achieve a reasonable ROI on their investment through litigation and licensing even if they acquire assets from LOT Network members.

**Ken Seddon**  
CEO, LOT Network  
October 2020

**“As members, we’re glad to see that LOT Network is keeping pace by increasing our protections daily with its explosive growth. The more members they have, the greater the protections we enjoy – all while retaining the traditional uses of our patents.”**

Jennifer Yokoyama, Vice President and Deputy General Counsel, Microsoft Corporation.

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# 1 Patent Assertion Entity Risk

## Understanding PAEs

Patent Assertion Entities (PAEs) are companies whose business model is to acquire patents and assert them against companies that sell products. By one estimate, PAEs are responsible for more than 90% of US high-tech patent litigation<sup>1</sup>. Operating companies spend billions each year litigating and settling with such companies<sup>2</sup>. This is particularly frustrating to operating companies because they can't use their patents in response, and this expenditure is not being put towards research and development, improved manufacturing, new products, or returned to investors.

For years now, there have been attempts to address this problem through both judicial and legislative patent reform. This includes legislative intervention with the enactment of the American Invents Act (AIA), and the implementation of inter partes review (IPRs).

Efforts even included attempts to discredit the PAE business model by referring to them with the pejorative term “patent trolls”.

While some of this has made a difference, the problem has not gone away. PAEs continue to be a real threat globally. In 2019, PAEs asserted over 1,400 patents in over 2,000 litigations worldwide. This includes PAE litigation in China and Europe (with a particular focus on Germany). Chart 1 analyses the top 10 technology areas that were the subject of these litigations in the US.

The painful irony of the corporate frustration with PAEs is that this is a problem of substantially their own making. PAEs rarely originate the patents that they use in their litigation campaigns. They acquire their patents from the very entities who complain about the problem – operating companies.

90%

of US high-tech patent litigation<sup>1</sup> was initiated by PAEs

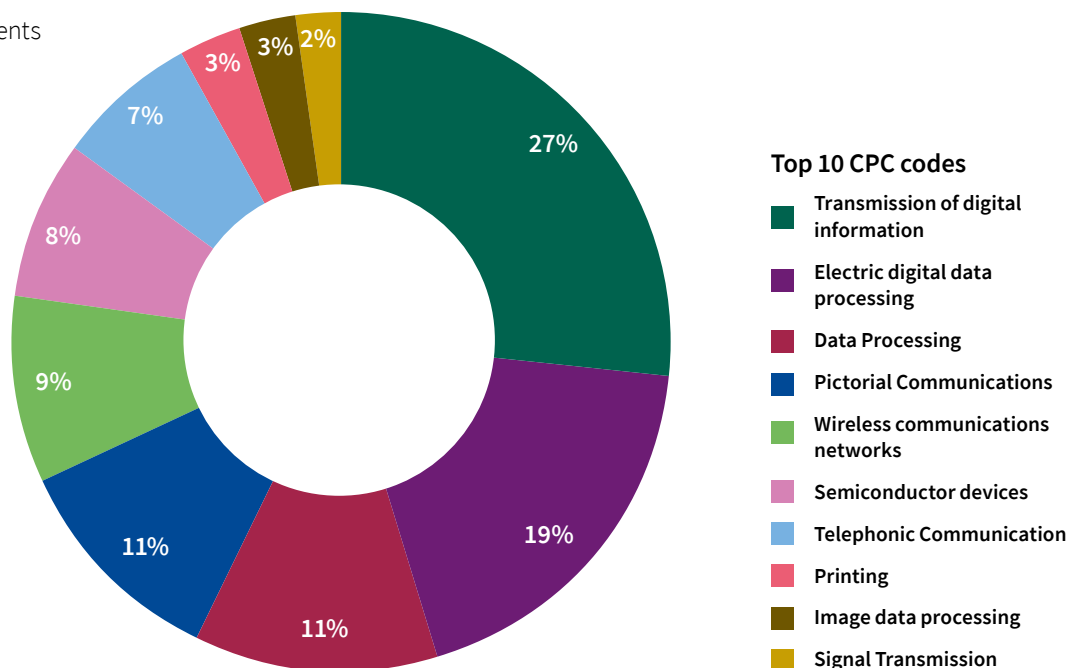
1,400+

patents were used by PAEs in over 2,000 litigations worldwide

In the first half of 2020, PAE purchases jumped from below 50% to almost

70%

Chart 1 | PAE litigated patents by technology (2019)



Source: Cipher.

<sup>1</sup> <https://www.unifiedpatents.com/insights/2019/12/30/q4-2019-patent-dispute-report>.

<sup>2</sup> Bessen, J., Ford, J., Meurer, M., The Private and Social Costs of Patent Trolls, Boston University of Law Working Paper No. 11-45, November 9, 2011.

### PAE acquisition strategies

As reported in the recent Richardson Oliver Law Group study for the first six months of 2020, it is resoundingly and increasingly corporate sellers that are supplying PAEs; over 70% of the 2,100 assets were supplied by operating companies. Chart 2 shows what percentage of the patents bought by PAEs came from which source. Although the volume for the first six months of 2020 was unusually high, operating companies generally supply the lion’s share of patents on the secondary market, but in particular, they are the largest supplier to PAEs. Each year, corporations supply between 500 and 1,500 patents to PAEs through this channel.

Over the past six years, PAEs have bought 7,000 patents from operating companies this way. This may seem like a drop in the bucket. But the story does not end there. Once PAEs buy patents from an operating company, they tend to buy more patents; Richardson Oliver’s analysis shows that PAEs continue to return to the same seller again and again once they have made the first purchase. Often these subsequent patent purchases are made privately meaning that even if you had wanted to bid on them, the opportunity did not exist.

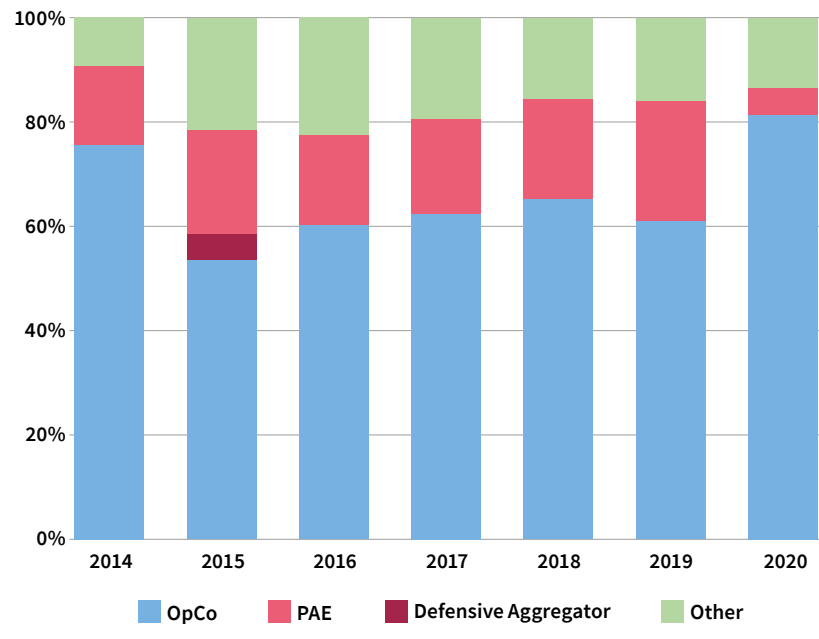
Chart 3 shows how PAE purchases have increased over time. In the first half of 2020, PAE purchases jumped from below 50% of the purchases to almost 70%. Richardson Oliver believes that the increase is mostly due to corporate buying pulling back, and PAEs stepping forward. Whatever the cause, this is disturbing data for corporate counsel.

Richardson Oliver Law Group tracks patent sales and particularly focuses on patents on the quasi-public patent market – these are typically patents sold by patent brokers and repeat direct sellers. Every year, about 10-20K patent assets enter the market this way.

Whether used for patent licensing, defensive strategy through counter-assertion, or some other purpose, these patents have a much higher chance of being “used”. PAEs

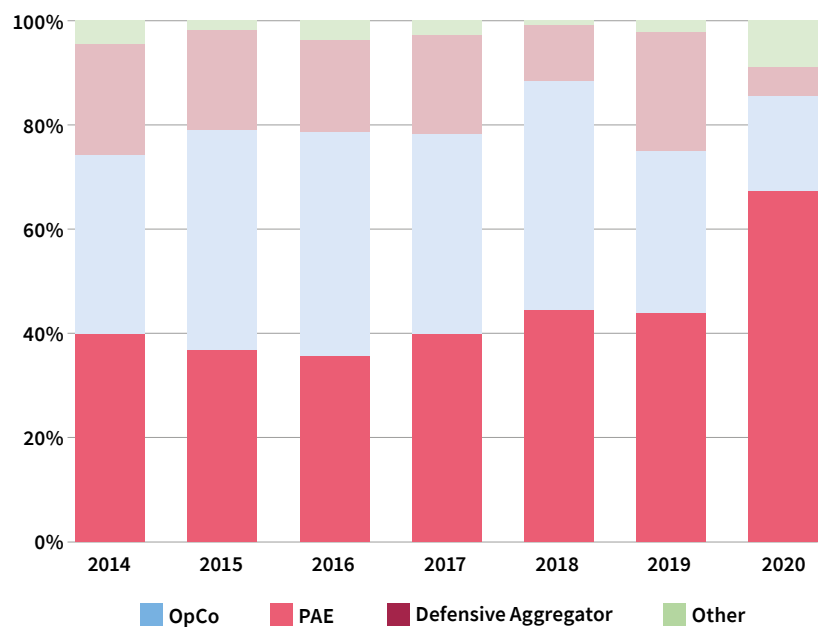
continue to acquire assets from operating companies and expect to make a reasonable return on their investment by asserting them against operating companies.

Chart 2 | Who supplies PAEs with patents



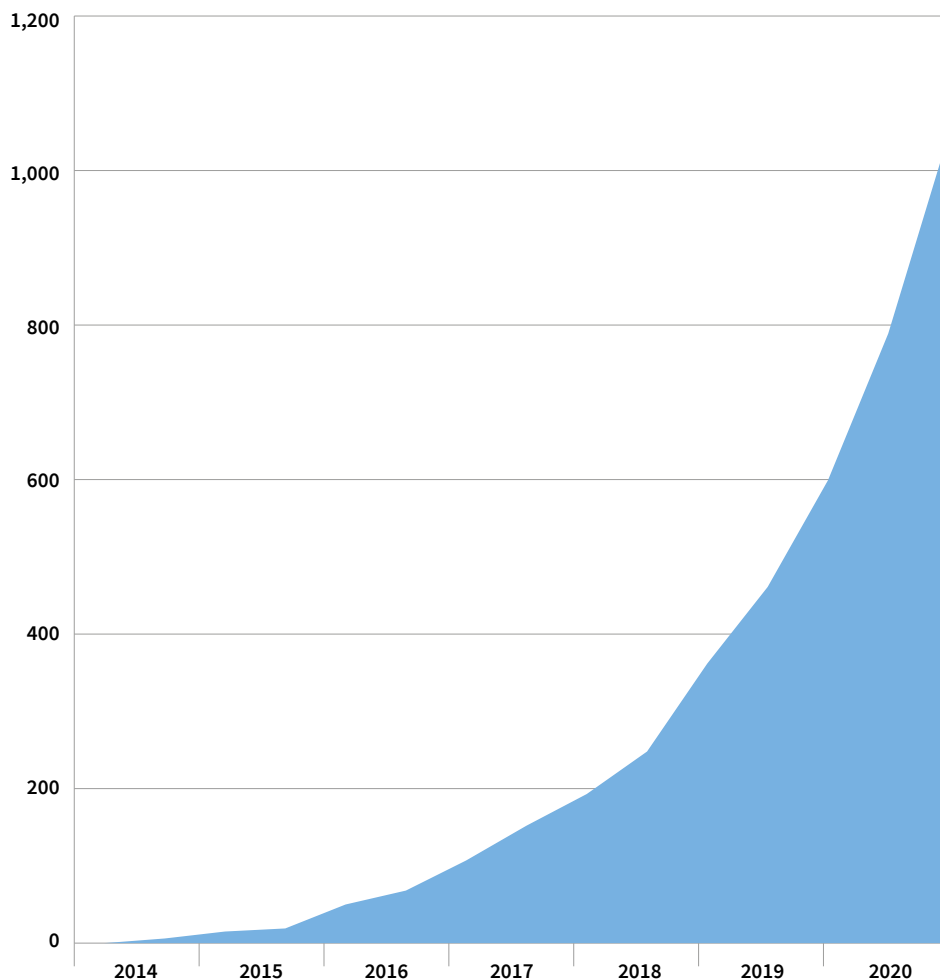
Source: Richardson Oliver Law Group.

Chart 3 | Percentage of patents bought by PAEs



Source: Richardson Oliver Law Group.

Chart 4 | LOT Network – Membership growth over time



**Year of joining – selected members**

<b>2020</b> DJI Geely Bank of NY Olympus China UnionPay Square Coca-Cola Xiaomi Airbnb IBM	<b>2018</b> Tencent Microsoft Denso Boeing <b>Cipher</b>
<b>2019</b> Comcast Toyota Citigroup Juniper Networks Visa Caterpillar Disney	<b>2017</b> Oracle Cisco Alibaba eBay Tesla Ant Financial
	<b>2016</b> Amazon Lenovo JP Morgan Hyundai Lenovo Nissan GM

**Founder Members:**  
Canon, Google, Red Hat

**For full list of members visit:**  
<https://lotnet.com/members>

Source: LOT Network.

## Understanding LOT Network

Since operating companies are the ones who are ultimately causing the PAE problem by selling their assets to PAEs, LOT Network was formed as a community of companies who agree to grant each other a non-exclusive, conditional license if any of their patent assets were ever transferred to a PAE<sup>3</sup>. LOT members are free at all times to continue to use their patent assets in any way they see fit. In effect, LOT Network members have addressed the root cause of the PAE issue and immunised themselves from the risk of PAEs, while at the same time, preserving all other uses of their patents.

It’s a reasonable question to ask whether LOT Network members are free to sell to PAEs and the answer is very definitely yes. Richardson Oliver has conducted this analysis and verified that over 1,600 US patents now owned by PAEs were formerly owned by LOT members. In many instances, the patents passed through the hands of more than one entity before ending up in the hands of a PAE. The impact of being a member is that those in the community receive a free license, but those not in LOT may be at risk of being sued.

LOT Network has grown its membership to over

**1,000**

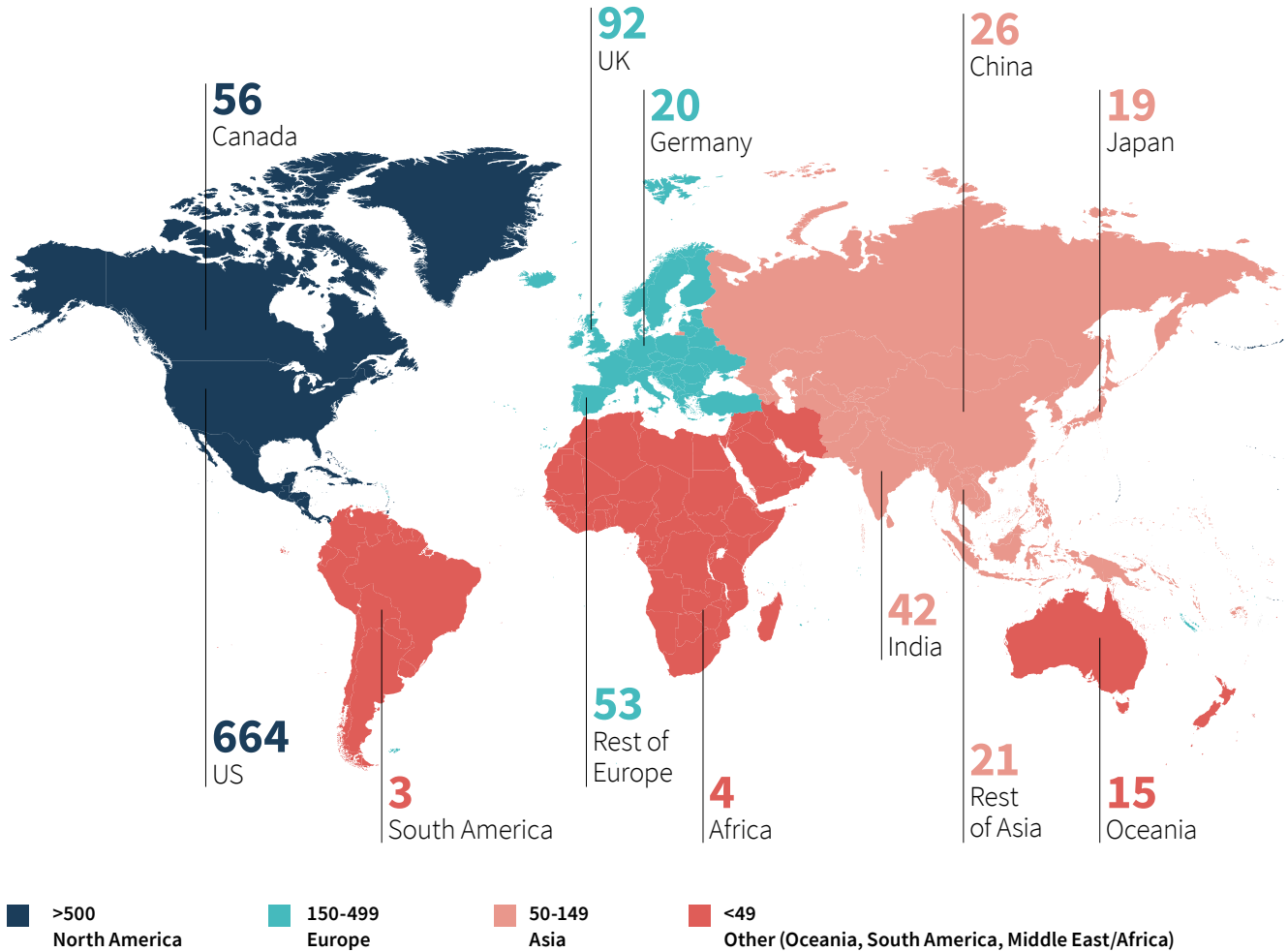
(October 2020)

**36**

countries where LOT Network members are headquartered

<sup>3</sup> LOT Agreement version 2.0, 05.10.18

Chart 5 | LOT Network – Members by geography



Source: LOT Network.

## 2 LOT Network today

LOT Network has grown its membership to over 1,000 members (October 2020) that are headquartered in over 36 different countries.

### LOT Network members

Chart 4 plots the growth of membership over this period, and current rate of exponential growth. Those members collectively own over 2.7 million patent assets worldwide protected in 55 different countries. LOT Network proudly counts the second, third, and fourth largest patent owners in the world who use their

Members collectively own

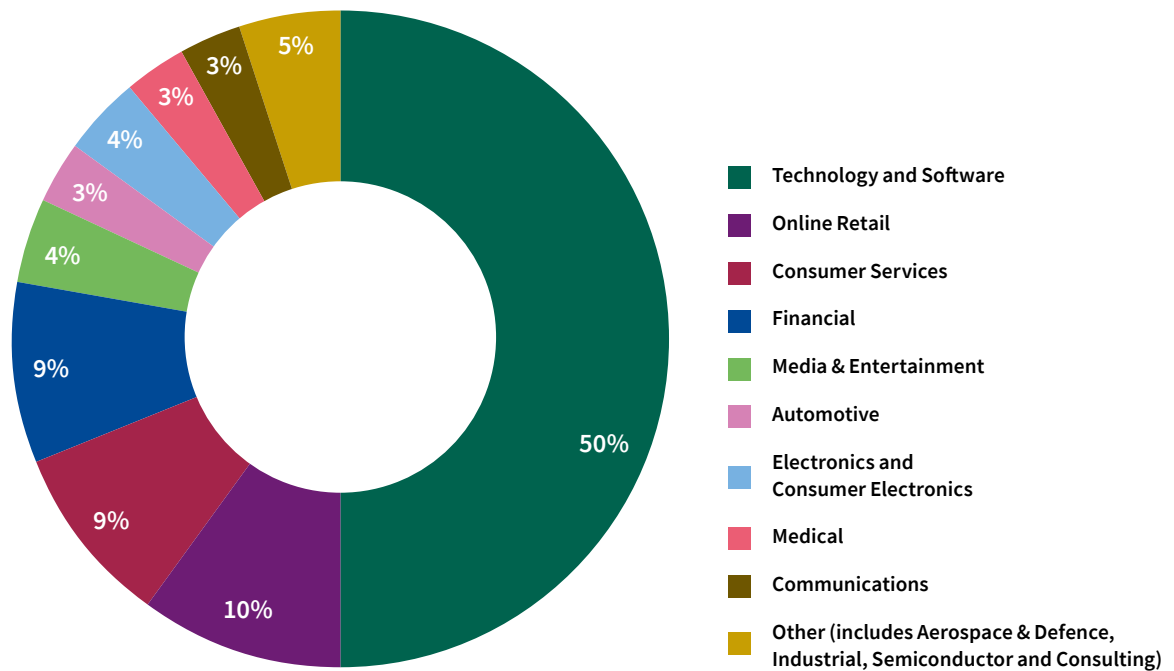
**2.7m+**

patent assets in 55 countries

**“Joining LOT Network serves to provide additional protection for NetScout’s strategic resources. Adding another layer of defense against PAEs is an important element in assuring innovation, appropriate allocation of corporate resources, and continued focus on growing our business.”**

Jeff Levinson, General Counsel, and Secretary, NetScout

Chart 6 | LOT Network - Members by sector



Source: LOT Network.

**“Start-ups need to overcome many risks before they can become mature, thriving companies. The LOT Network is a powerful and creative new idea that will help ensure that patent abuse need not be one of them.”**

Dustin Moskovitz, Cofounder, Asana

patents to protect their innovations and to support their business. Charts 5 and 6 depict membership by geography and sector.

LOT Network is simply self-defining a community of companies who are voluntarily deciding in advance that they do not want to be the ones who are unlicensed when the assets are transferred to a PAE. Members gain value by sharing their rights in return for other rights which they value. They are not disposing of value or devaluing, but rather gaining value. Ultimately that is why LOT has grown as fast as it has.

### How LOT Network works

Each member of LOT Network, regardless of their revenue or size of their patent portfolio, signs the exact same document. Under the LOT Agreement, members are committing to give the other members of the community a free license to any patent assets if and when those patents assets are ever transferred to a PAE as the following diagram illustrates.

The more companies and the more assets that are within the network, the greater the protection afforded to members.

## 3 The LOT Network Portfolio

With its rapid growth in membership, LOT Network has aggregated rights to the largest patent portfolio in the world. There are now over 2,780,606 active worldwide assets subject to the LOT Agreement. This includes all active patents and applications owned by a member during their membership – including patents that have been transferred to a third party by way of M&A, assignment or any other transaction. Patents that have expired or applications that have been abandoned or rejected are not included in this number. In the following sections, the aggregate of these patents and applications are referred to as the **LOT Network Portfolio**.



# Illustration of the LOT Agreement's Operation



The diversity of LOT Network members means that the LOT Network Portfolio offers protection for all companies, whatever size they are, the sector in which they operate or their geographic location. It is however challenging to keep track of a portfolio of this size. For this, LOT Network relies on Cipher, a leading provider of strategic patent intelligence. In the sections that follow, Cipher has analysed the LOT Network Portfolio by both sector and technology. We start with an overview.

## LOT Network Portfolio – an overview

To give you a sense of scale, there are over 24m granted patents in force globally, with China in the lead by a considerable margin (Chart 7). There are approximately 3.3m granted US patents and over 400,000 of these are in the LOT Network Portfolio. That represents over 12% of all US granted patents.

Looking at the LOT Network Portfolio from a PAE perspective is equally impressive. In 2019, PAEs litigated over 1,100 patents. The

LOT Network Portfolio includes over 1.7m patent assets in the same technology class codes as these litigated patents.

The LOT Network Portfolio has global coverage, with patent assets in 55 jurisdictions. The portfolio has almost equal protection across all regions. Chart 8 analyses the LOT Network Portfolio by IP5 region (IP5 is a forum of the five largest Patent Offices in the world, namely US, Japan, China, EPO and Korea).

The LOT Network Portfolio includes

**1.7m+**

patent assets in the same technology class codes as patents litigated by PAEs

Chart 7 | Granted patents globally

Country	Granted patents globally
China	8,688,863
US	3,295,374
Japan	2,139,884
Korea	1,191,917
Germany	1,030,299
ROW	7,812,025

Source: Cipher, June 2020.

The LOT Network Portfolio has

**28%**  
coverage in the US

The LOT Network Portfolio has the greatest coverage in the US, closely followed by China (24%) and Japan (23%)

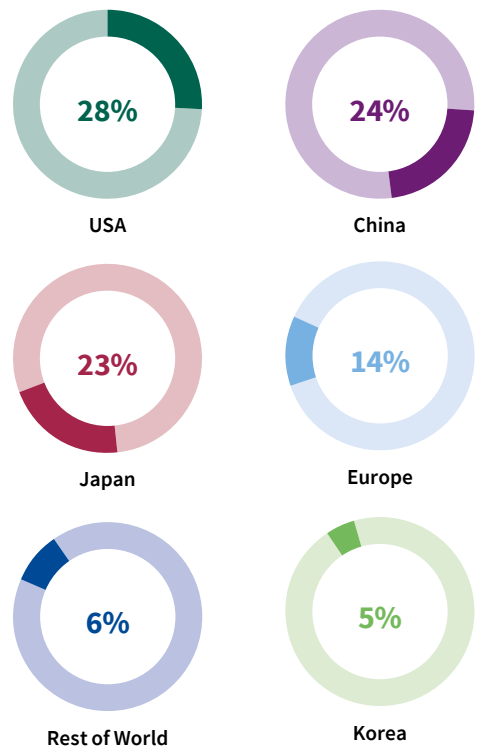
An alternative view is to analyse the LOT Network Portfolio by territory (rather than region), and to analyse patents and applications independently (rather than at family level). This data is contained in Chart 9.

The fact that there is a significant pipeline of applications reflects the reality that the rate of patenting continues to increase. Covid will have no material impact of this<sup>4</sup>.

The LOT Network Portfolio covers a very broad range of technologies, and one way to appreciate this is to analyse the LOT Network Portfolio by the CPC classification system widely used by all major patent offices. Chart 10 represents the top 20 areas within the LOT Network Portfolio.

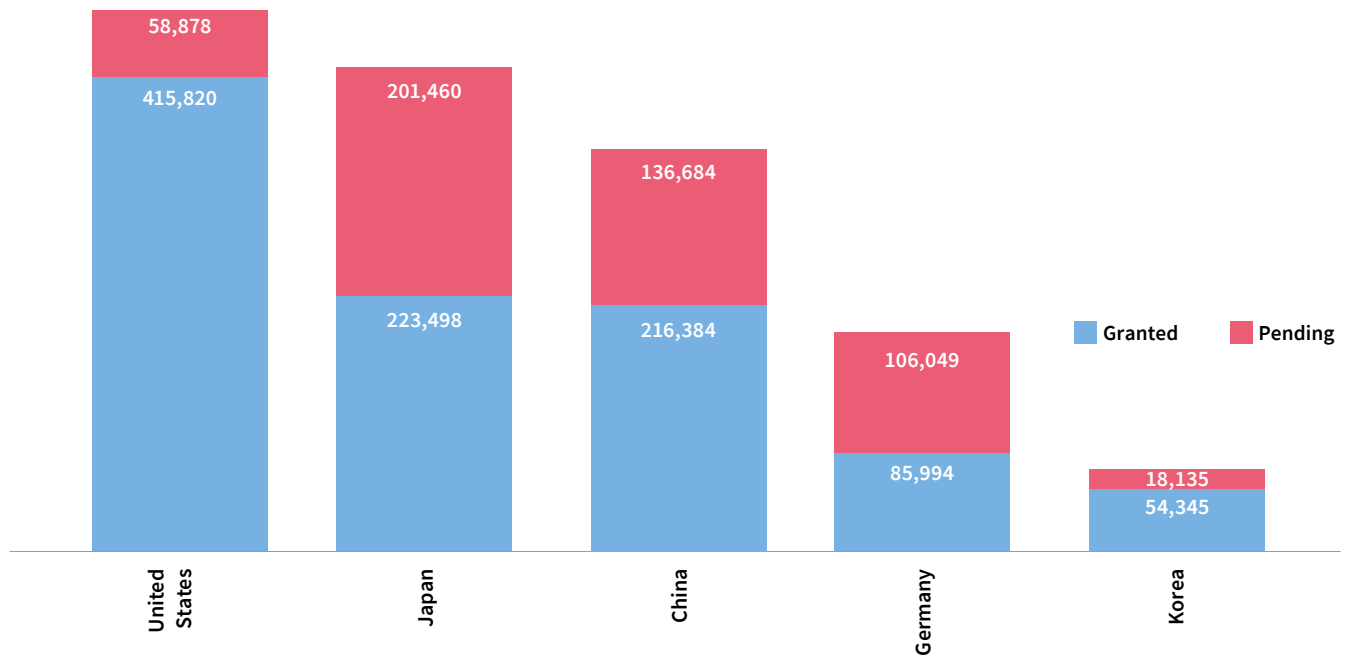
As the LOT Network Portfolio encompasses thousands of CPC codes, it may be difficult for a company to fully appreciate the value received when joining LOT Network. Using

**Chart 8 |** LOT Network Portfolio by region



Source: Cipher, Active patent families by region.

**Chart 9 |** LOT Network Portfolio – Top 5 countries



Source: Cipher, Granted patents and applications.

**“We believe that patents should be utilised to encourage innovation and the growth of industries by practicing entities, which aligns us with the mission of LOT Network.”**

Yosuke Iida, IP General Manager, Toyota

advances in AI and machine learning, CIPHER is able to classify the LOT Network Portfolio in an objective and repeatable way – a task which until quite recently would be impractical to undertake manually.

LOT Network Portfolio includes

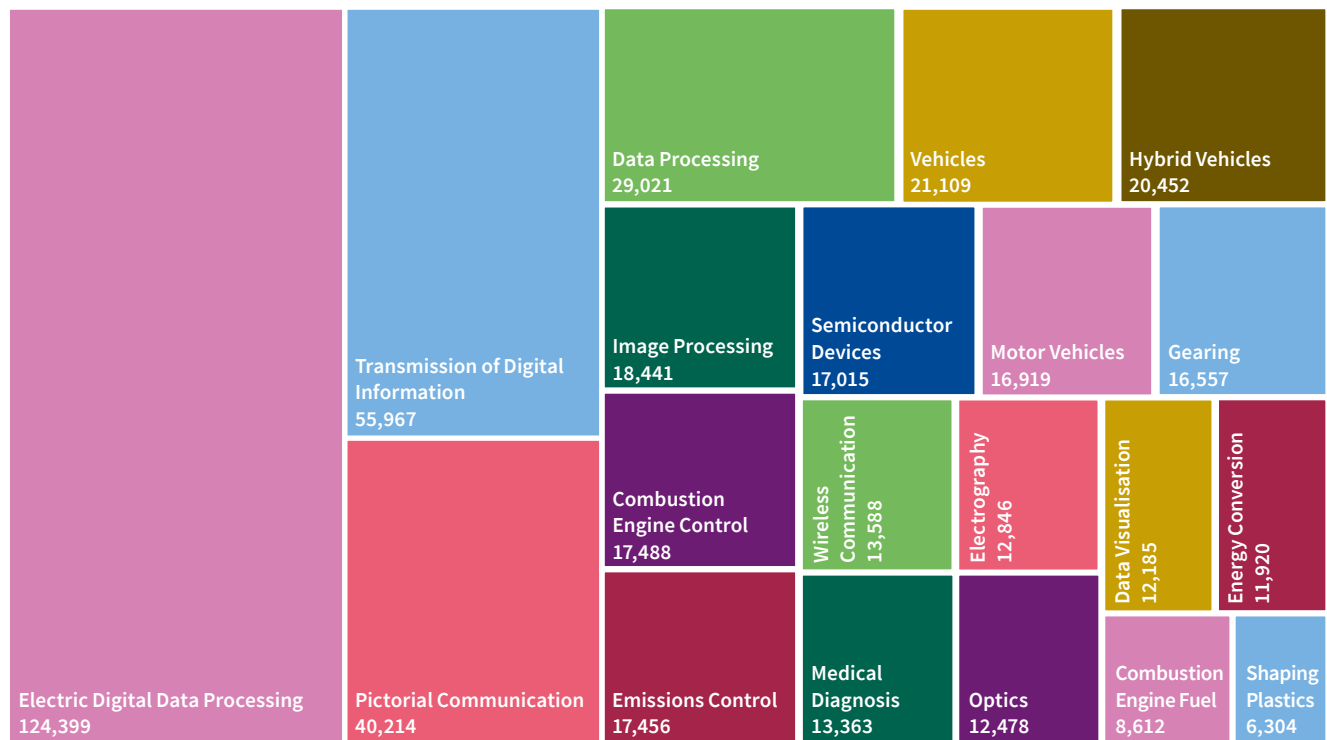
**12%+**

of all US granted patents

**LOT Network Portfolio by Sector**

LOT Network members come from a broad range of sectors (see Chart 6), and the LOT Network Portfolio is analysed below by reference to a number of taxonomies developed by CIPHER for companies engaged in the automotive, financial services and industrial automation sectors. Also included is an analysis by reference to the AST Product taxonomy.

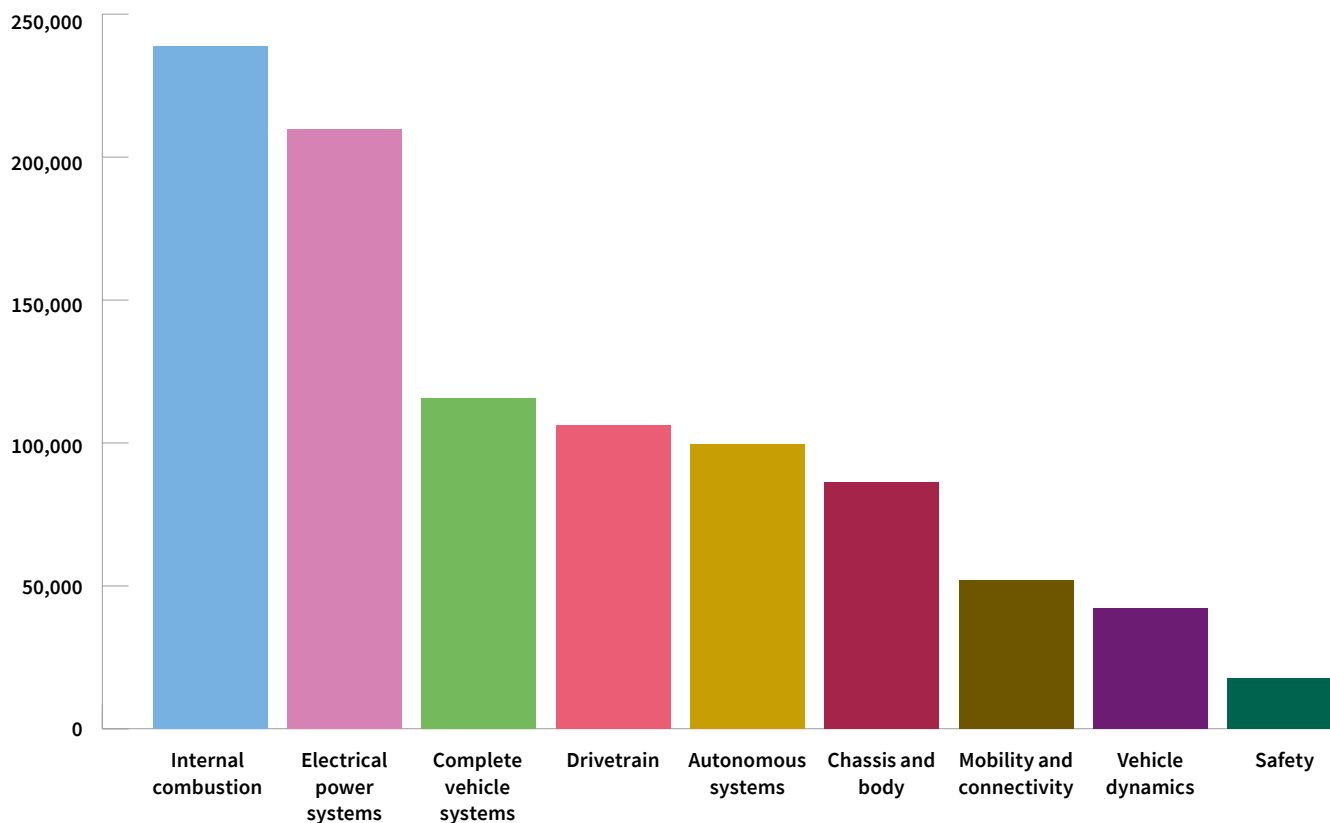
**Chart 10 | LOT Network Portfolio – Top 20 technologies**



Source: CIPHER, patent families analysis by dominant CPC code definition showing number of patent families.

<sup>4</sup> CIPHER’s analysis of the dot.com crash (2000-02) and the Global Financial Crisis of (2007-09) shows only minor interruptions in exponential growth: *Mitigating the Impact of Patent Budget Cuts in Recession*, May 2020.

Chart 11 | LOT Network Portfolio – Automotive Technologies Overview



Source: CIPHER, Automotive Taxonomy, by Grants and Applications.

**38%**

of the LOT Network Portfolio relates to the automotive sector

**A Automotive**

LOT Network’s membership includes all 7 of the world’s largest automotive OEMs. It is therefore unsurprising that over 38% of the LOT Network Portfolio relates to the automotive sector, with large parts of

this relating to technologies fundamental to the future of mobility including electrification, autonomy and mobility. Chart 11 classifies these patents into broad automotive technology areas.

**“With the convergence of the chemical industry and digital technologies, our sector has increased exposure to PAE litigation. Innovation is core to our business, and we feel it’s important to take a stance against anything that could interfere with the fair use of intellectual property.”**

Gilbert Voortmans, Vice President, Head of Intellectual Property Rights, Covestro

## B Financial Services

The risk of patent litigation to financial institutions has grown significantly in recent times. LOT Network has been successful in attracting high profile patent owners concerned by the rise of PAE activity in this area including JP Morgan Chase, Citibank, TD Bank, US Bank, Wells Fargo, Visa, Alibaba, Ant Financial, China UnionPay, American Express, FIS, Equifax, AON, Transamerica, Zelle, BNY Mellon, Square, Vanguard, Intuit, BMO, JD Finance, BlackRock, Royal Bank of Canada, and many fintech startups and unicorns.

The LOT Network Portfolio includes over 135,000 financial services patent assets, which can be analysed across a number of key technology areas (Chart 12).

**Chart 12** | LOT Network Portfolio – Financial Services Technologies Overview

Technology	Granted patents and applications
AI & Blockchain	14,363
Authentication & Authorization	30,242
Banking Services & Products	2,649
Computing Infrastructure	53,597
Customer Services	1,086
Payment Technologies	5,495
Security & Privacy	29,213

Source: Cipher, *FinTech Taxonomy*, by Grants and Applications.

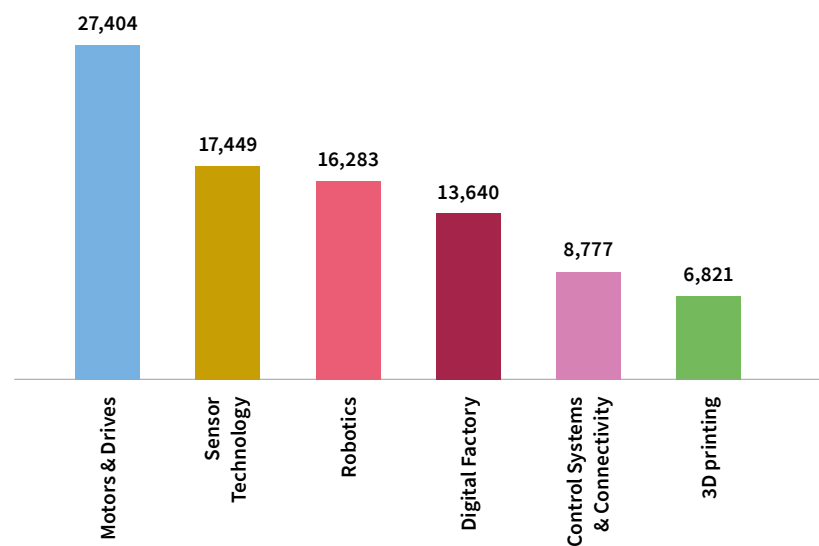
## C Industrial Automation

Similarly, PAEs have started to focus on technologies at the heart of Industry 4.0, the Fourth Industrial revolution. Over 90,000 assets within the LOT Network Portfolio are relevant to technologies such as 3D Printing, Digital Factory, Robotics and Sensors that are critical to companies active in this area (Chart 13).

## D AST Product Taxonomy

LOT Network works closely with AST (Allied Security Trust), most recently evidenced by the announcement<sup>5</sup> that LOT Network members will be offered preferential licensing of assets which AST proposes to sell on the open market. Thanks to a collaboration between AST and Cipher, it is also possible to analyse the LOT Network Portfolio through the lens of the AST Product taxonomy – an industry accepted view across a broad range of patented technologies (Chart 14).

**Chart 13** | LOT Network Portfolio – Industry 4.0 Technologies Overview



Source: Cipher, *Industrial Automation Taxonomy*, by Grants and Applications. July 2020.

5%

of the LOT Network Portfolio relates to the Financial Services sector

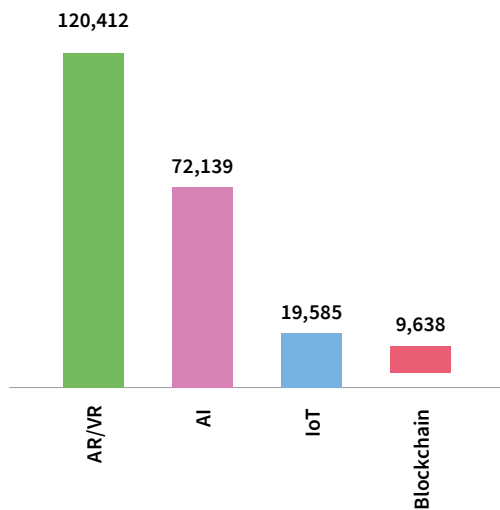
<sup>5</sup> [www.iam-media.com/defensive-aggregation/lot-and-ast-announce-new-deal-making-relationship](http://www.iam-media.com/defensive-aggregation/lot-and-ast-announce-new-deal-making-relationship)

**Chart 14** | Overview using AST Product taxonomy

<b>401,618</b> Software	<b>106,182</b> Services	<b>63,074</b> Semiconductor	<b>48,743</b> Display	<b>15,732</b> Memory
<b>177,561</b> Components	<b>105,855</b> Consumer Electronics	<b>60,359</b> Computer Systems and Components	<b>43,261</b> Storage Systems and Equipment	<b>14,677</b> Optical Components
<b>153,314</b> Application Specific ICs	<b>63,657</b> Communication Equipment	<b>52,765</b> Wireless	<b>38,260</b> Micro-components	<b>10,936</b> Lighting
<b>124,397</b> Medical and Imaging				

Source: Cipher, Cipher n/d powered by AST Product Taxonomy (top level), aggregate of granted patents and applications. July 2020.

**Chart 15** | LOT Network Portfolio – key technologies



Source: Cipher, Key Technologies by aggregate of granted patents and applications. July 2020.

This illustrates the diversity of the LOT Network Portfolio and evidences the relevance of the LOT Network Portfolio across sectors including Semiconductors, MedTech and Consumer Electronics.

### LOT Network Portfolio by Technology

The LOT Network Portfolio can also be analysed by specific technologies where PAEs have already acquired patents. Chart 15 analyses the LOT Network Portfolio by mapping patents to Cipher classifiers in the area of AI/ML, Internet of Things (IoT) and Augmented and Virtual Reality (AR/VR).

The reality is that with over 2.7m patent assets, LOT Network is relevant to virtually every company with any level of interest in technology or innovation more generally.

**60,000+**

Semiconductor patents in the LOT portfolio

**“The structure of the LOT Network helps protect innovative patent owners from unwarranted litigation, without stifling valid, beneficial uses of patents, such as cross-licensing. As long as a company owns their patent they retain all their rights to it.”**

Anthony DiBartolomeo, Senior Vice President and Chief IP Counsel, SAP

## 4 What does the future hold?

PAEs have been part of the IP landscape for over 30 years and given the hundreds of millions of dollars being invested to acquire assets or to support assertion campaigns through litigation finance, it is clear they are here to stay.

What is bizarre about the current situation is the near universal criticism of the billions of dollars spent on the defence and resolution of PAE disputes, combined with the on-going sale of patents to PAEs by operating companies. LOT Network was formed to allow operating companies to address this problem, while preserving the traditional uses of patents.

LOT Network member Annual Revenue	LOT Network member Annual Fee
< \$25 million	Free
\$25 million+ to \$50 million	\$5,000
\$50 million+ to \$100 million	\$10,000
\$100 million+ to \$1 billion	\$15,000
> \$1 billion	\$20,000 (capped)

For most, joining LOT Network has been an easy and obvious decision even before IBM and the hundreds of other companies that joined LOT Network this year. Using the real-world example of IBM’s well publicised patent sales to WiLAN provides an easy way to calculate the return on investment, particularly when measured in light of the number of companies who are now immunised to those assets<sup>6</sup>.

At the same time, LOT Network is a non-profit, and the license protection offered can be obtained for zero or a trivial amount. Companies with less than \$25m in annual revenue can join for free, while companies with over \$1B in annual revenue pay just \$20k.

# 2.7m

patent assets in the LOT Network Portfolio and growing every day

**“Our membership in LOT Network continues to be a valuable protection against costly, unwanted PAE litigation – saving us potentially millions of dollars that we can apply to research, development and talent instead of legal fees.”**

Emily Lough, Associate General Counsel, Intellectual Property, Tesla Corporation

Today’s reality is that PAE litigation is prevalent, and PAEs are increasing their acquisition activity in the patent transactions market. PAEs are leveraging the convergence of technology and venturing into new sectors and new geographies to maximise their economic return. The current economic downturn will likely only exacerbate this reality.

In response, LOT Network is a self-defining group of patent holders who want to preserve the value and uses of their patents while enjoying the herd immunity that comes from 2.7m patent assets in the LOT Network Portfolio. As each new member joins the LOT Network community, the pool of companies that can be sued by a PAE using a LOT Network Portfolio patent shrinks. Thus, for those without a license, the risk that they may be sued grows.

**For more information visit LOT Network at:  
www.lotnet.com**

<sup>6</sup> Patent sales are now an integral part of our innovation cycle,” says William LaFontaine, IBM’s IP head in an interview published by IAM on October 26, 2020: <https://www.iam-media.com/law-policy/ibm-global-ip-head-the-fallacy-of-efficient-infringement-and-more>

## LOT Network would like to thank the contributors to this Report

### About CIPHER

Cipher is the leading strategic patent intelligence platform, and a member of the LOT Network. Cipher maintains the master list of all patents owned by members and captured by the LOT umbrella. All data in this report is generated by Cipher and accurate as of September 2020, unless otherwise indicated. The sector and technology classification is generated from Industry and Technology classifiers developed for and used by many of the leading patent owners in their sectors.

*All charts in this report may be reproduced with the following attribution: Source: Cipher from LOT Network Report 2020, October 2020.*

For more information, go to [www.cipher.ai](http://www.cipher.ai) or email [info@cipher.ai](mailto:info@cipher.ai)



### About Richardson Oliver Law Group

ROL Group has over 60 years of IP strategy and execution experience, both in-house and at large law firms. ROL focuses on business questions first. We guide companies through unique IP challenges—like buying and selling patents, developing licensing programs, defending against patent assertions, and creating a value-driven IP portfolio. We give direction to businesses that share our passion for new ideas, creative problem solving and forward motion.

For more information, visit [www.roipatents.com](http://www.roipatents.com)

