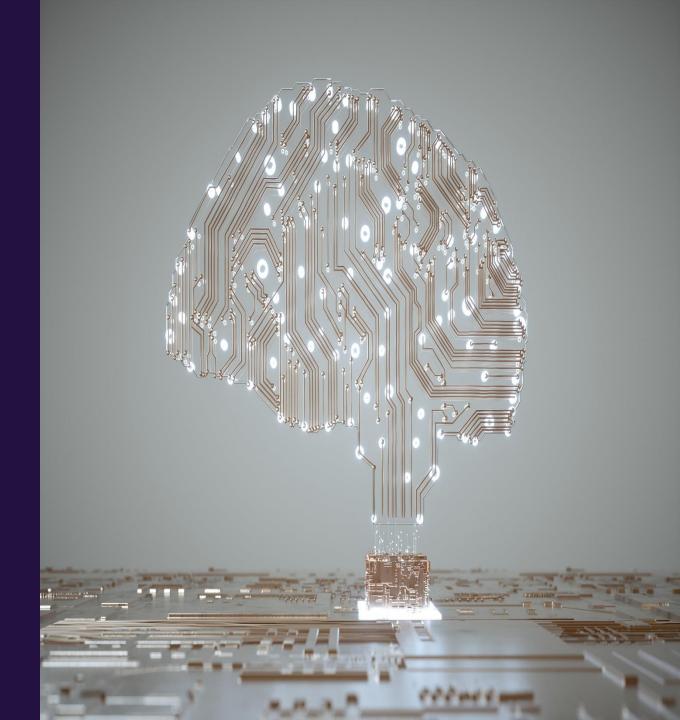


Unique Data. Expert Analysis. Innovative Solutions. One Platform.

Report Code: GDDT-PL-M101

Patent Statistics and Analysis Q1 2022

A data-driven quarterly report highlighting key trends in the patents landscape compared to the corresponding quarter in previous years



Report sections and key findings



1. Regional spotlight

- China seized the major share of patent grants and continued to exhibit its hegemony
- World Intellectual Property
 Organization (WIPO) witnessed the
 highest YoY growth in Q1 patent filings
 at 21%

4. Top patented sectors

- Power & Utilities saw the highest filings with a focus on clean technologies to meet sustainability goals
- Retail recorded an AAGR of 10%, owing to the pandemic-induced interest in e-commerce, delivery robots, and supply chain analytics.

2. Movers & shakers

- Asian companies spearhead the global patenting activity, Samsung grabs the top spot while Bosch the fastest growing
- The US leads in the patent filings from startups, while China from universities

5. <u>Licensing & litigation trends</u>

- The licensing deals of LG and Volkswagen caught media attention
- Samsung, Pfizer, and Moderna were abuzz in the news for infringement litigations

3. Top patented technologies

- Artificial intelligence (AI) garnered the highest traction in patent filings followed by fintech
- Audio-visual technologies grew at the highest YoY rate in Q1 of 45%

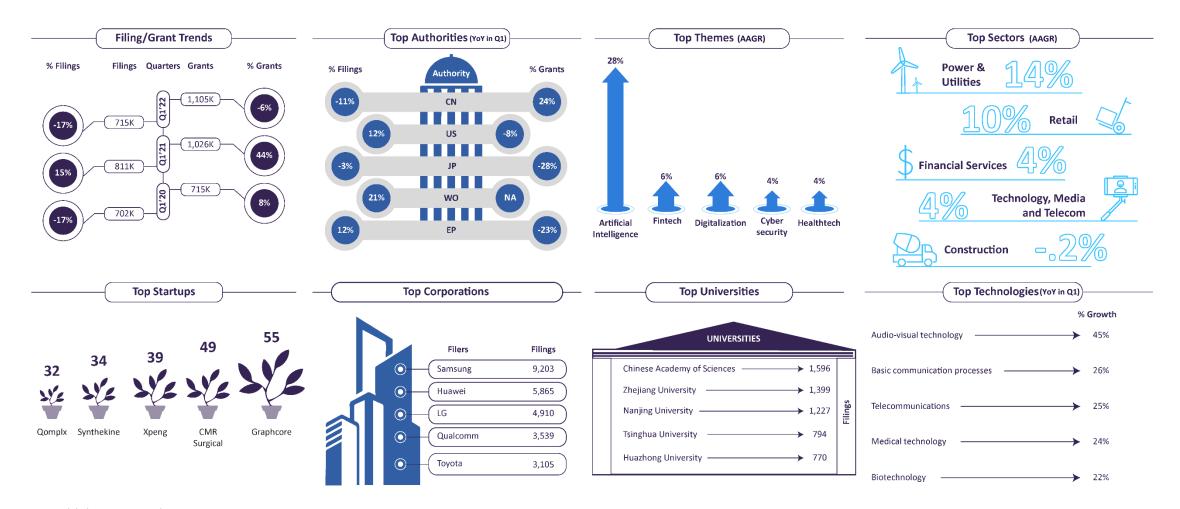
6. Social media & trend analysis

- Microsoft's mixed-reality headset HoloLens gathers steam to transform we experience reality
- Samsung's foldable laptop and Amazon's delivery robot made noise over the social media

Analytical summary



- Patent grants grew by 8% YoY in Q1'22* which could be primarily attributed to the utility model patents in China.
- WIPO registered the highest growth of 21% in patent filings, while the US follows at 12%.
- Patenting activity in AI has grown by an AAGR of 28% and is anticipated to continue in 2022.



Source: GlobalData Patent Analytics

Regional spotlight



Q1'22 sees the highest grants over the last five years on a like-for-like comparison



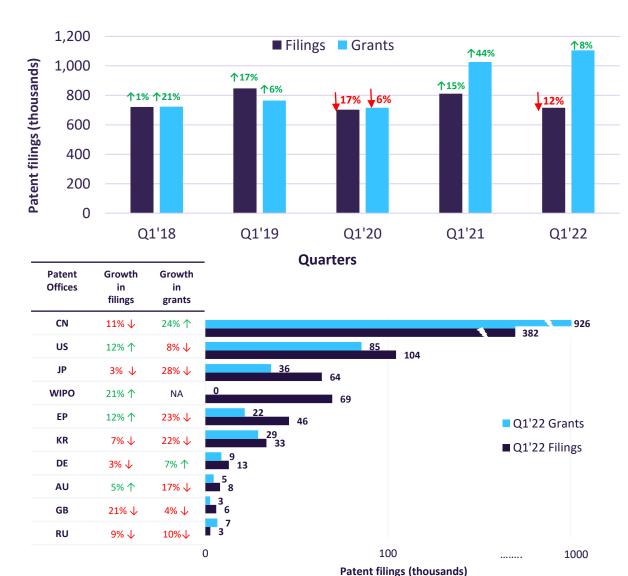
... China continues its hegemony with a 24% growth in grants

Number of patent filings and grants by quarter: Q1'18-Q1'22

- Q1'22 recorded the highest number of patent grants primarily owing to a 29% growth in China's utility model patents.
- Amid the Russia-Ukraine conflict, Russia passed a law allowing the unrestricted use of patents owned by unfriendly countries, which could be a key reason for its fewer patent filings and grants.
- According to a UK government IP report, there is evidence of a small number of applicants switching from the GB patent office to the EPO due to disparities in fees and coverage, which led to a drop in patent filings in the GB.

YoY growth in the number of patent filings and grants across top patent offices: Q1'21-Q1'22

- According to a USPTO report, the US has implemented a patent program to optimize the application pendency that triggered the surge in patent filings.
- WIPO registered the highest growth in filings of 21% in Q1'22, largely found in the technology, media, and telecom (TMT), automotive, healthcare, and oil & gas sectors.
- The Australian government has passed a legislative in August 2021 to phase out innovation patents, which resulted the drop in Australian patent grants.



Huawei is patenting aggressively in China, USA, WIPO, and Europe



- The top assignees in CN and JP patent offices are dominated by domestic filers. Nanjing University is the only academic institution in China's top five filers.
- The US patent office has most of the patent filings from Asian corporates primarily South Korea and China, IBM and Qualcomm are the only US-based filers competing with them.
- Huawei is the only filer with a presence in all four of the top patent offices, dominating the WIPO and EP patent offices.

Top five assignees in each patent offices by total filings: Q1'22









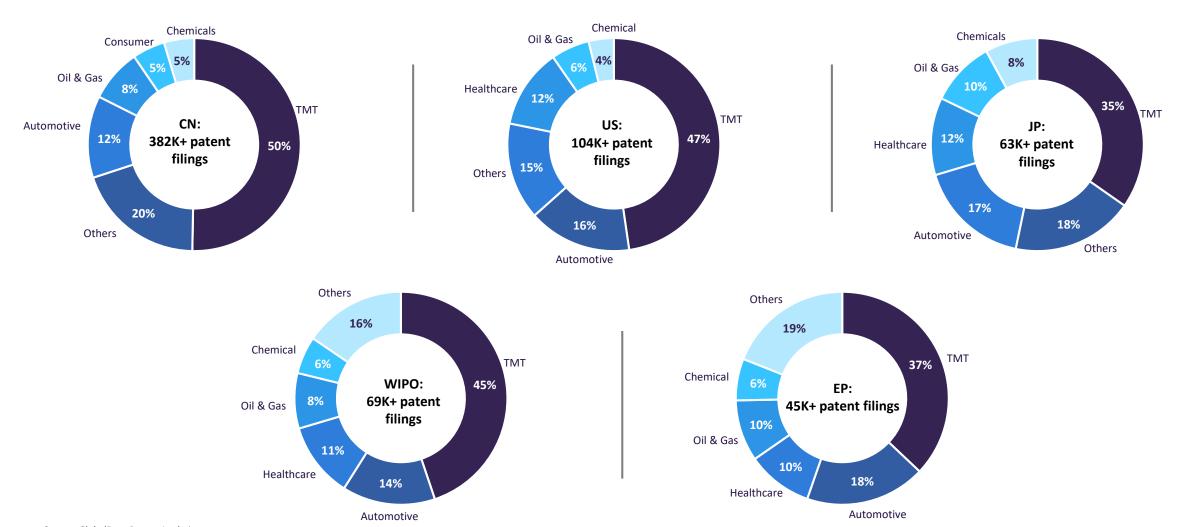


TMT technologies dominate patent filings across top patent offices...



...automotive clinch the second place

• China sees 50% of its patent filings in the TMT sector, while the country seems to struggle in healthcare when compared to others.





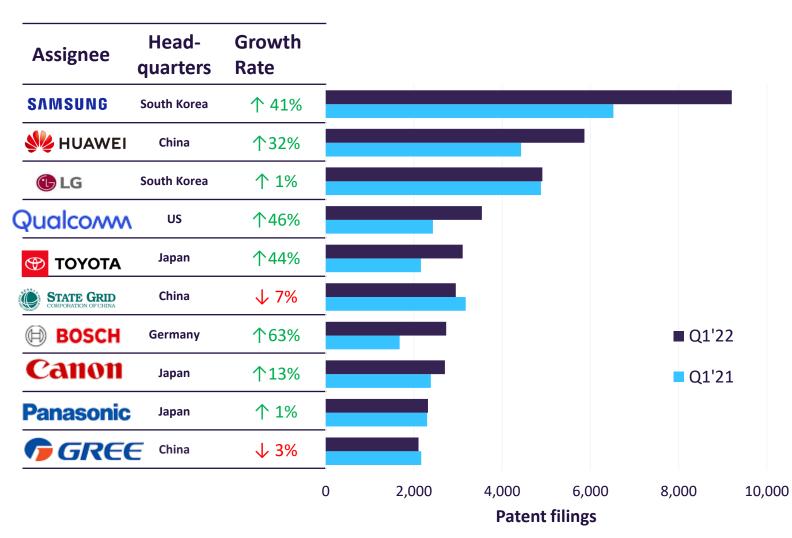
Movers & shakers



Asian companies dominate, Samsung No. 1 and Bosch fastest growing



YoY growth in patent filings by top ten corporate assignees: Q1'21-Q1'22

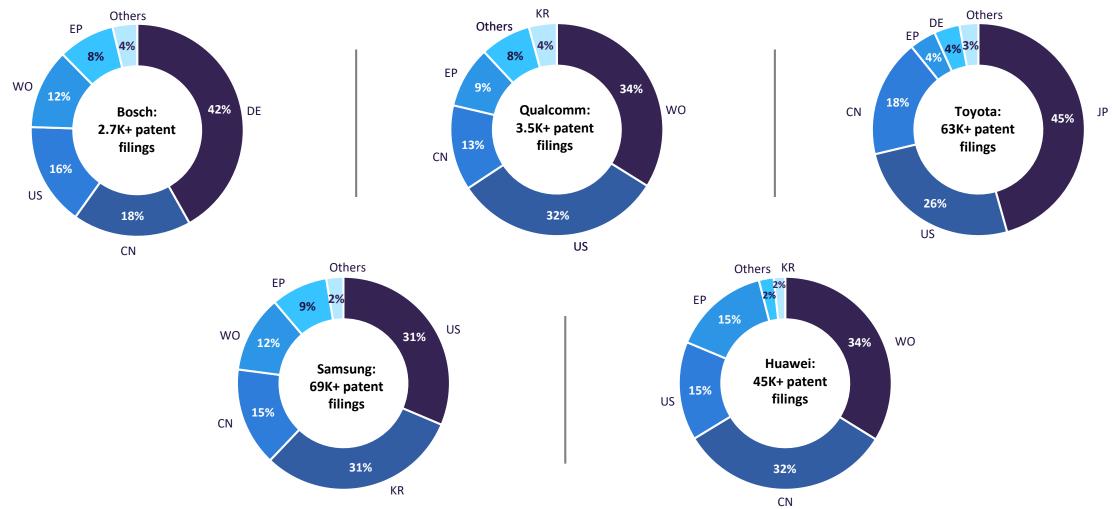


- According to a WIPO report*, the rise of investments in innovative and creative industries, and the need to secure these investments through intellectual property is pushing forward the patenting activity in Asia.
- Samsung dominated patent filings with a focus on semiconductors, wireless communications, digital data processing, and video-on-demand technologies.
- Bosch witnessed the highest growth of 63% in patent filings. The company witnesses more than 40% of its filings from Germany revolving around electric batteries, hybrid automobiles, electric vehicles, and radio navigation, among others.





...Bosch prefers to file patents in Germany (DE) rather than Europe (EP), Samsung filed the bulk of its patents in the US and South Korea, while Toyota in Japan and the US.



US startups lead the patent filings and UK's Graphcore witnessed the highest growth



YoY growth patent filings by top ten startups with their headquarters and funding: Q1'21-Q1'22



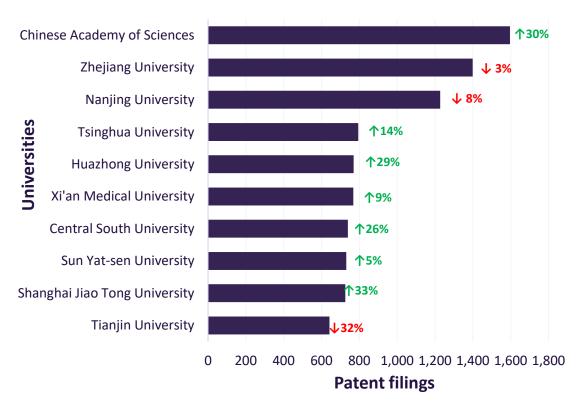
- US-based startups dominated the patent filings.
- US-based Synthekine and China-based Xpeng have filed 34 and 39 patents, respectively in Q1'22 compared to none in Q1'21.
- UK-based startup Graphcore, which builds machine intelligence processors to speed up machine learning and AI applications, has seen the fastest growth of 588% in patent filings.



Chinese universities take the lion's share of the filings by academia

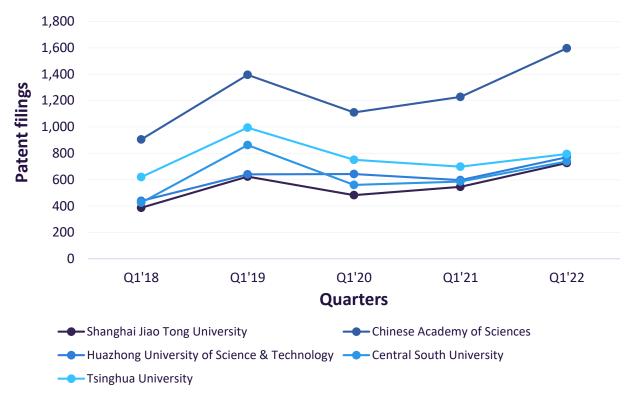


YoY growth patent filings by top ten academia: Q1'21-Q1'22



- All the top ten universities in Q1'22 were from China, which was due to the incentive program (Interim Administrative Measures for Beijing Patent Application Supporting Fund) offered by China's central and local governments to improve the number of patents.
- Chinese Academy of Science filed the highest number of patents in Q1'22 at a growth of 30% with a focus on batteries, nanomedicines, and digitalization.

Patent filing trends of top five academia by YoY growth: Q1'18-Q1'22



- China's Shanghai Jiao Tong University registered the highest filings growth of 33% in Q1'22 with its research focus on digitalization, healthtech, and 3D printing.
- Excluding Q1'20 possibly due to the impact of the COVID-19 pandemic, Chinese universities have seen a gradual increase in patent filings over the last five years in Q1 quarters.



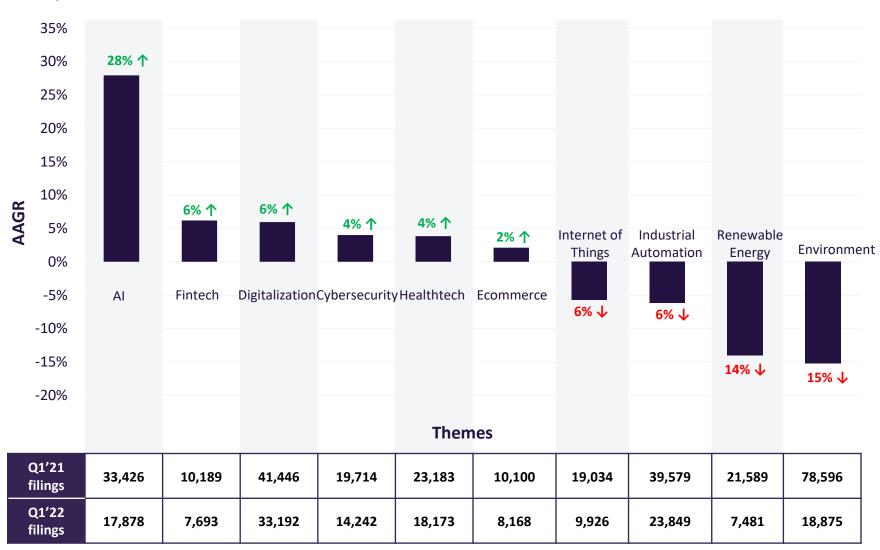
Top patented technologies



Al sees the highest growth in Q1'22 and is expected to continue the momentum



Top ten themes based on AAGR: Q1'18-Q1'22

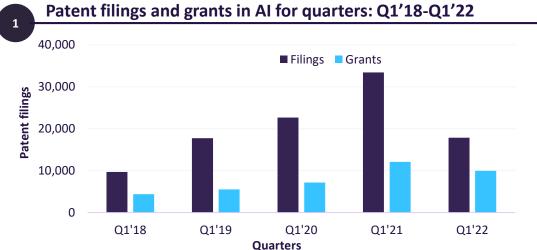


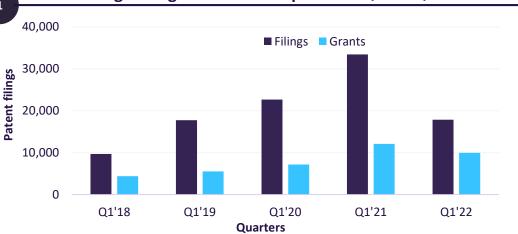
- Al recorded the highest AAGR of 28% primarily owing to the rise in the invention of machine learning (ML) models, speech recognition, image analysis, and natural language processing systems.
- The research focus of fintech was on payment architectures, e-commerce, and cryptography.
- Cybersecurity has registered an AAGR of 4% where China's tech giant Huawei stood as the top filer. Most of Huawei's patent inventions are related to security arrangements to protect computers against unauthorized activity, verifying user identity or authorization, and 5G security.

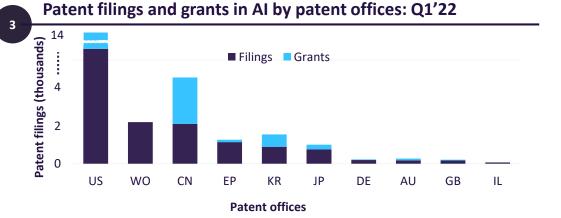
US is the world leader in AI with a strong backing from IBM

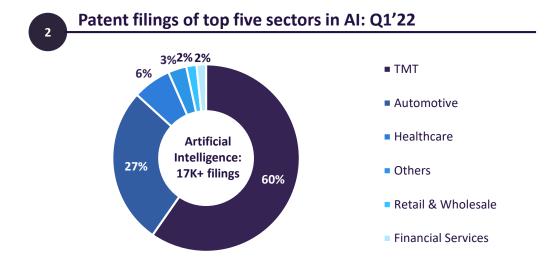


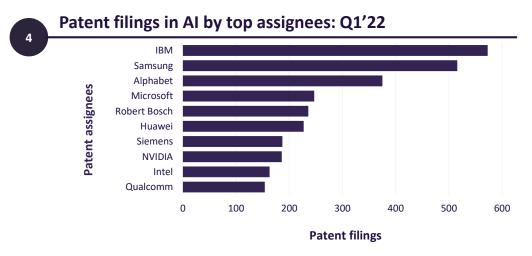
- Most of the AI patents in Q1'22 were filed in the US followed by WIPO and CN.
- IBM is the leader in AI patent filings with a focus on ML models, natural language processing algorithms, and neural network fingerprint verification technologies.









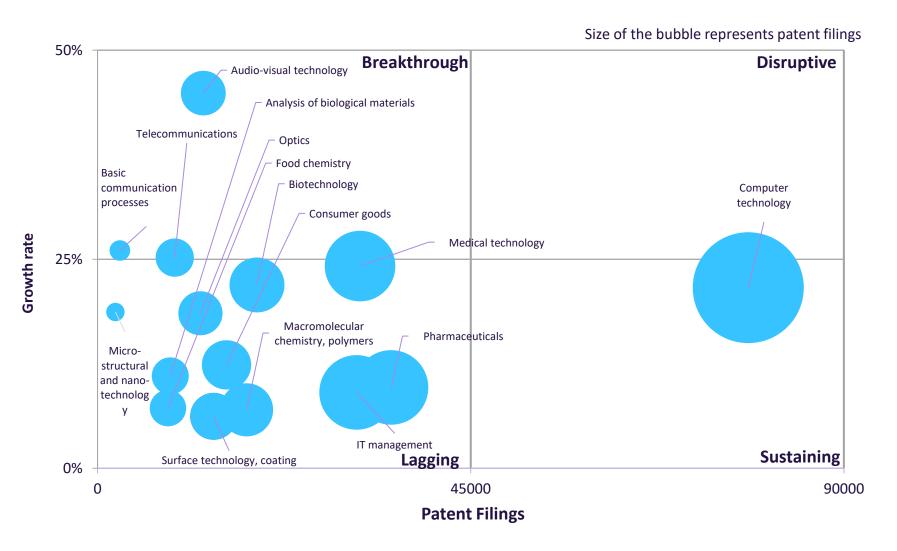




Audio-visual technologies recorded the highest growth of 45%



IPC concordance technology leaderboard for top 15 technology fields in the last two quarters (Q1'21-Q1'22): filings Vs growth rate



- Computer technology recorded the highest patent filings in Q1'22 with a growth of 22%. The focus was primarily on computer models based on neural networks, image data processing, and video recognition.
- Audio-visual technology, which includes video conferencing, head-mounted displays, and earpods, has seen the highest growth of 45%.

Source: GlobalData Patent Analytics

Top patented sectors



Power & utilities sector witnessed 14% growth with its radar on clean technologies



Top ten sectors based on AAGR: Q1'18-Q1'22



- The power & utilities sector has witnessed an AAGR of 14% with the highest share in power generation using solar-based technologies.
- The COVID-19 pandemic has prompted the retail sector to find new methods to approach customers, including online retail, delivery robots, and supply chain analytics, which boosted the sector's growth. GlobalData uncovers key pockets of innovation within retail likely to be disruptive using in-depth patent analytics (detailed on slide 20).
- Financial services grew by 4% AAGR, mostly due to inventions in the cards and payments industry. Payment architecture, e-commerce, and financial data security platforms were the main topics covered under the cards and payments.
- TMT has grown by 4% AAGR as a result of increased research engagement in digitalization, cybersecurity, and machine learning.

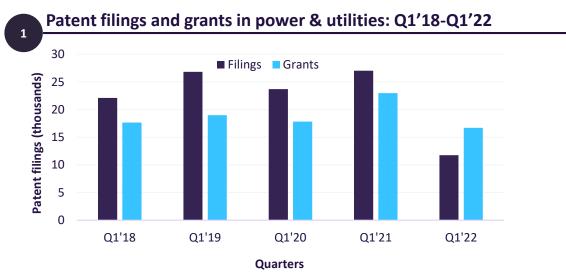


Climate change related innovation observed nearly 23% growth in filings...

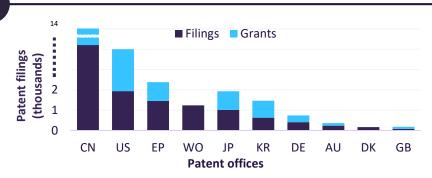


...China leads the space

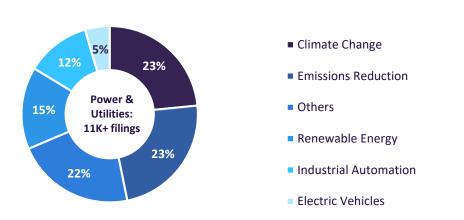
- Clean energy technologies particularly climate change, emissions reduction, renewable, and electric vehicles are gaining momentum in the power & utilities sector.
- Siemens dominates the patent filings in Q1'22 followed by GE with a major focus on wind motors.



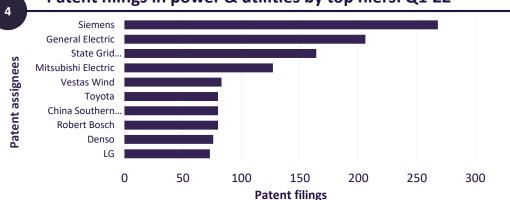
Patent filings and grants in power & utilities by patent offices: Q1'22



Patent filings of top five themes in power & utilities: Q1'22



Patent filings in power & utilities by top filers: Q1'22





Our TII model identifies multiple emerging/accelerating innovation areas with disruptive potential in retail







Machine

Scans millions of patents to identify key innovation areas witnessing sudden spurt in growth or continued momentum using detailed taxonomies



Human Intelligence

Innovation/industry experts filter these based on their potential to disrupt, use cases they present, and businesses they impact for a fundamental assessment

+

Licensing & litigation trends



LG's licensing deal for GEMX platform and MPEG patent suit caught media's attention



Patent licensing in Q1'22:



LG has licensed its GEMX platform from CAMX Power





VW upgrades Avanci patent pool license, paving the path for Acer's infringement settlement



Publication date - March 7, 2022

LG has licensed intellectual property from CAMX on the GEMX platform of highenergy, high-performance nickel-based cathode materials for use in lithium-ion batteries, particularly electric vehicles. The platform is based on CAMX's core technologies, which have been granted key patents around the world, including the US, EP, KR, JP, and CN. Publication date - March 8, 2022

Avanci announced that Volkswagen (VW) has expanded its existing relationship with the Avanci one-stop licensing marketplace to include 4G standard-essential patents (SEPs). Acer filed infringement suits on VW, forcing VW to upgrade the Avanci pool license from 3G to 4G patents.

Patent litigation in Q1'22:



Alnylam files patent infringement suit against Pfizer and Moderna





Samsung sued for infringement of MPEG's HEVC essential patents



Publication date – March 17, 2022

US-based RNAi therapeutics company Alnylam Pharmaceuticals filed a separate lawsuit in the US District Court for the District of Delaware against Pfizer and Moderna seeking damages for infringement of patent US11246933 in the manufacture and sale of their messenger RNA (mRNA) COVID-19 vaccines. The patent covers Alnylam's biodegradable cationic lipids, which are supposedly critical to the mRNA COVID-19 vaccines' effectiveness.

Publication date – March 28, 2022

MPEG has filed infringement suit against Samsung in Germany's Landgericht Düsseldorf under MPEG's HEVC patent portfolio license. The patents are critical to the HEVC (also known as H.265 and MPEG-H Part 2) digital video coding standard, which is utilized in products that encode and decode video for transmission, reception, and use on the Internet, television, and mobile devices.

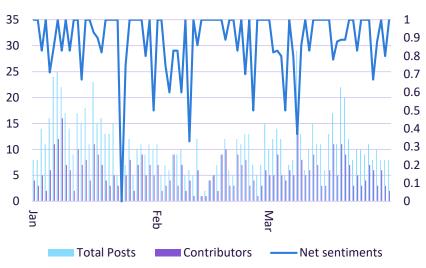


Social media & trend analysis

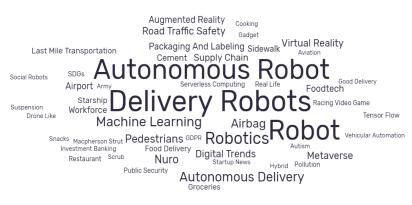


 Amazon has filed a patent for a delivery system that includes unmanned aerial vehicles (UAVs) and robots that transport food and goods, providing consumers with convenient new services to improve their daily lives.

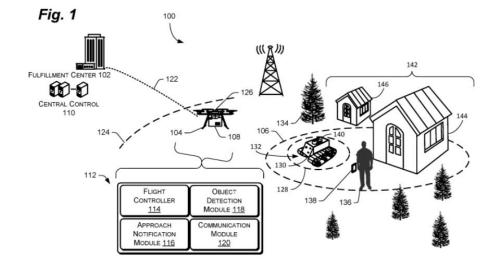
Social media sentiments around delivery robot



Trending topics around delivery robot



Sector: Retail



US11231706B1 - Landing and delivery robot

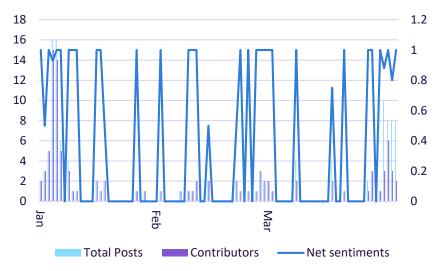
Publication date – January 25, 2022

- Amazon has a patented autonomous package delivery system comprising an aerial drone and a delivery robot to deliver the packages to the residential housing.
- The aerial drone communicates with the delivery robot to coordinate a landing spot for the two drones to meet. The packages can subsequently be transported by the delivery robot from the aerial drone's landing spot to its destination.

Foldable laptop

- The foldable laptop is the most discussed device in Q1'22. It registered the highest social media activity in January 2022 where Samsung achieved significant mentions.
- Samsung has filed a patent on a multifoldable laptop with a flexible screen and a split in the middle of the keyboard, allowing for the additional horizontal fold.

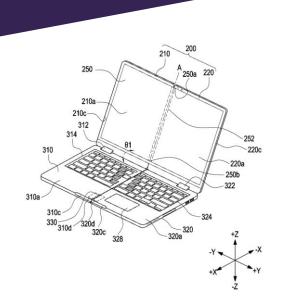
Social media sentiments around foldable laptops

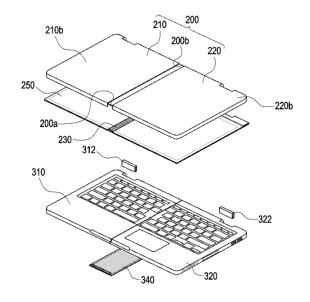


Trending topics around foldable laptops



Sector: TMT





WO2022010195A1 - Multi-foldable electronic device

Publication date – January 13, 2022

- Samsung has patented a laptop with extra hinges on the keyboard and screen that allows it to be folded multiple times.
- The laptop features a clip that glides over and clamps onto the layers to keep it foldable and prevent it from unfolding accidentally.

Source: GlobalData Social Media Analytics and GlobalData Patent Analytics

Note: Social media graphs represent the activity related to "foldable laptop" as a keyword on Twitter and Reddit during the period. Total Posts indicate no. of posts on a specific keyword, Contributors reflect the no. of unique users discussing the subject, and Net Sentiments indicate the positive-negative perspective of the subject.

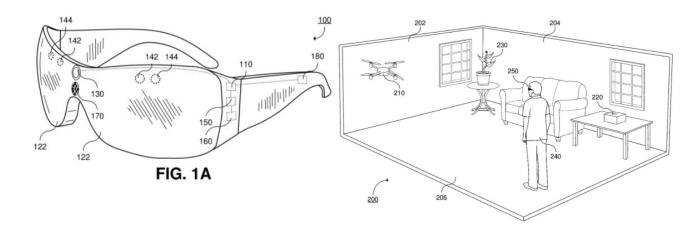
Microsoft's HoloLens aims to transform the way we experience reality

US11257292B2- Object holographic augmentation

Publication date – February 22, 2022

- Microsoft patented holographic systems using its mixed reality device (HoloLens). It captures image data for a real-world object included in a physical space and automatically classifies it as being associated with an object classification based on the image data.
- It also automatically identifies a software application based on the real world linked with the object categorization and executes it on the mixed reality device in conjunction with the real-world object.
- HoloLens is a set of mixed reality smart glasses that can show data, integrate with the real world, or even create a virtual world.
- The HoloLens contains a slew of optical sensors, including two on each side for peripheral environment sensing, a main downwardfacing depth camera for picking up hand motions, and specialized speakers that imitate sound from any location in the room.





Tech players are shifting gears towards 6G wireless communication

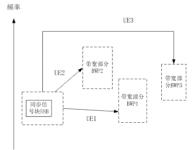


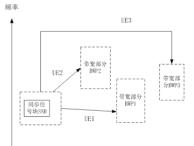


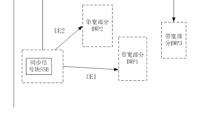
WO2022027693A1 - Communication method and apparatus

Publication Date - February 10, 2022

For each 5G or 6G service, the power consumption or terminal equipment requirements are varied. Some may necessitate more energy use than others. The terminal equipment must have a lower power consumption to adjust to the different power requirements. Huawei has patented a system to reduce the power consumption of the terminal device when communicating between the network device and the terminal device.



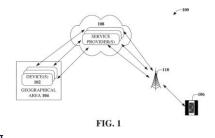




US20220104294A1 - Geo-distributed dynamic network for ubiquitous access to multiple private networks

Publication Date - March 31, 2022

The impending 5G, 6G, and/or other next-generation wireless communication protocols pose distinct challenges in terms of providing service level agreements. AT&T has patented a geo-distributed dynamic network system that allows customers to connect to 4G and 5G networks from any location using a private network connection.

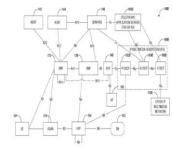




US20220038893A1 - Latency reduction in 5G and 6G networks

Publication Date - March 16, 2022

As the number and variety of communication devices have expanded considerably, the related network environment, which includes routers, switches, bridges, firewalls, and load balancers, has become increasingly complex and sluggish. Intel has a patented system for minimizing latency in which the scheduler uses the size of the PDCP (packet data convergence protocol), MAC (medium access control), and RLC (radio link control) headers to establish the predicted TB (transport block) size for packet transfer.

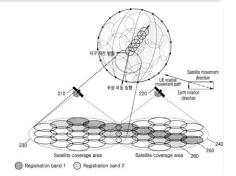


SAMSUNG

WO2022060008A1 - Technique and apparatus for managing mobility of terminal in satellite communication system

Publication Date - March 24, 2022

Due to satellite movement, the terminal of a satellite communication system frequently changes. Samsung has patented a 5G or 6G communication technology that regulates a terminal's mobility in a satellite communication system, allowing the terminal to successfully transmit and receive signals with a base station and a satellite.





Key considerations



Key considerations



- The report is based on GlobalData's Patent Analytics database which covers a bibliography from all 100+ patenting authorities.
- All patents are tagged to 20+ industry sectors and 180+ themes based on technology classification, keywords, and associated companies.
- Our patents database further disambiguates assignee names (350K names) and associates corporate tree hierarchy in current ownerships.
- GlobalData sources content directly from national patent offices every week.
- The data slice considered is from January 2022 to March 2022.
- The sectorial and thematic analyses are considered based on their average annual growth rate (AAGR) from Q1'18 to Q1'22.
- The YoY growth is calculated by considering the corresponding quarter in the previous year.
- Patents were analyzed based on IPC concordance provided by WIPO where the growth was calculated on a YoY basis in Q1'22.
- The report includes all the published utility, design, divisional, continuation, continuation-in-part, grants, and utility models while excluding defensive publications, reissue, search reports, statuary invention registration, and re-examination certificate.
- The patent offices are represented as CN -China, US- USA, JP- Japan, WO- WIPO (world intellectual property organization), EP- Europe, KR- South Korea, DE Germany, AU Australia, GB- Great Britain, RU- Russia, DK- Denmark, and IL- Israel, PCT patent corporation treaty.

Glossary



Patent

Patent is the document defining a right conferred by the grant but is often used to mean published specification

Assignee

An individual or group of people who have the permission or right to manufacture or license an invention by the inventor, bound by contract

Application date

The date on which the application, which contains disclosure of the invention is submitted to the patent office

Publication date

The publication date is the date on which a patent application is first published. It is the date on which the document is made available to the public, thereby making it part of the state of the art. A publication date range can be selected based on the user's requirement to search for prior art between the date ranges

Filings

These are pre-grant publications published by a patent authority once the patent is filed by an applicant. In most authorities, the patents are usually published within 18 months from the date of filing depending on the patent laws of that authority

Grant

These are patent documents issued/granted by the patent authority as per patent laws in the patent authority

Patent Offices

The public body which received and grants patents in each country

IPC

IPC stands for international patent classification, a hierarchical classification system used primarily to classify and search patent documents according to the technical fields they pertain

Themes

GD defined specific themes

Sectors

GD defined specific sectors

Methodology

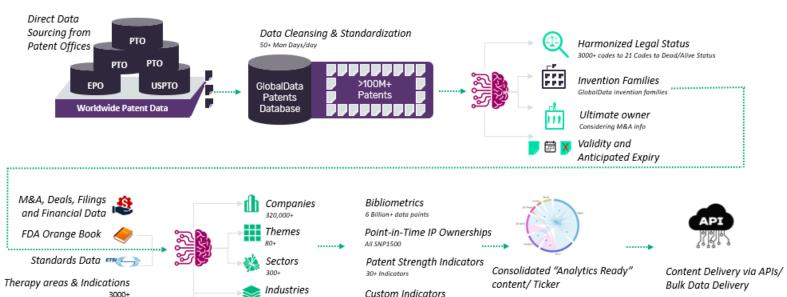


Our approach towards consolidating "analytics-ready" worldwide patent data



GlobalData provides patent data through patent analytics tool as well as through sFTP and API to its customers.

GlobalData's approach for patent data processing



- Our patent data is directly sourced from Global patent offices such as USPTO and EPO. The update frequency
 depends on the data that we are sourcing. For instance, US grants and applications are sourced directly from USPTO
 every Tuesday and Thursday in a week while the Assignment data is updated daily in the GD patent backend
 database.
- The data is fed into our state-of-the-art data consolidation work where we cleanse, standardise, and further enrich the data by tagging it to our industry leading propriety GD taxonomies (Sectors, Themes, Companies, ICs & Countries).
- The data is available through GlobalData ICs or sFTP dump or from API.

Countries

Contextualizing patent data in alternate data universe



Dataset Name	Coverage
Historical Start Date for PIT	January 2000 onwards
Data Coverage	Over ~112 M patents as on 7 th January 2022
Regional Coverage	Asia-Pacific; Europe, Middle East & Africa; North America; Latin America
Country Coverage	104 Authorities (specifics available on request)
Company Coverage	Public Companies – 13,000 Start-up – 9,800+ S&P1500 – 1,400+
	Private Companies – 12,000
Sector Coverage	18 Industries + Disruptor platform (specifics available on request)
Taxonomies Used	➤ GlobalData's industry and sector taxonomy (6,060 Sectors)
	➤ GlobalData's proprietary Thematic taxonomy (186 Themes)
	Cooperative Patent Classification (CPC)
	> International Patent Classification (IPC)
Identifiers	ISIN, Tickers for publicly traded companies.
Patent Indicators	40+
Availability of	From July 1782 onwards with Thematic taxonomy
Historic Datasets	
Collection /	Weekly
Delivery Time	
Lag Time	+14 days
Delivery Methods	API or customized FTP
Delivery Formats	JSON, CSV, XML

More about us

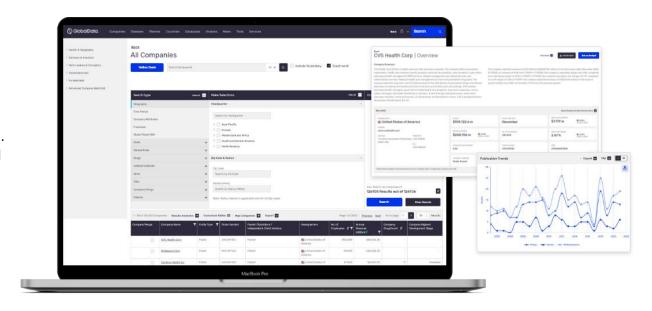


About GlobalData



GlobalData is a leading provider of data, analytics, and insights on the world's largest industries.

In an increasingly fast-moving, complex, and uncertain world, it has never been harder for organizations and decision makers to predict and navigate the future. This is why GlobalData's mission is to help our clients to decode the future and profit from faster, more informed decisions. As a leading information services company, thousands of clients rely on GlobalData for trusted, timely, and actionable intelligence. Our solutions are designed to provide a daily edge to professionals within corporations, financial institutions, professional services, and government agencies.



Unique Data

We continuously update and enrich 50+ terabytes of unique data to provide an unbiased, authoritative view of the sectors, markets, and companies offering growth opportunities across the world's largest industries.

Expert Analysis

We leverage the collective expertise of over 2,000 in-house industry analysts, data scientists, and journalists, as well as a global community of industry professionals, to provide decisionmakers with timely, actionable insight.

Innovative Solutions

We help you work smarter and faster by giving you access to powerful analytics and customizable workflow tools tailored to your role, alongside direct access to our expert community of analysts.

One Platform

We have a single taxonomy across all of our data assets and integrate our capabilities into a single platform – giving you easy access to a complete, dynamic, and comparable view of the world's largest industries.



GlobalData

www.globaldata.com

For any questions or further enquiries please contact us at: customersuccess.disruptor@globaldata.com

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