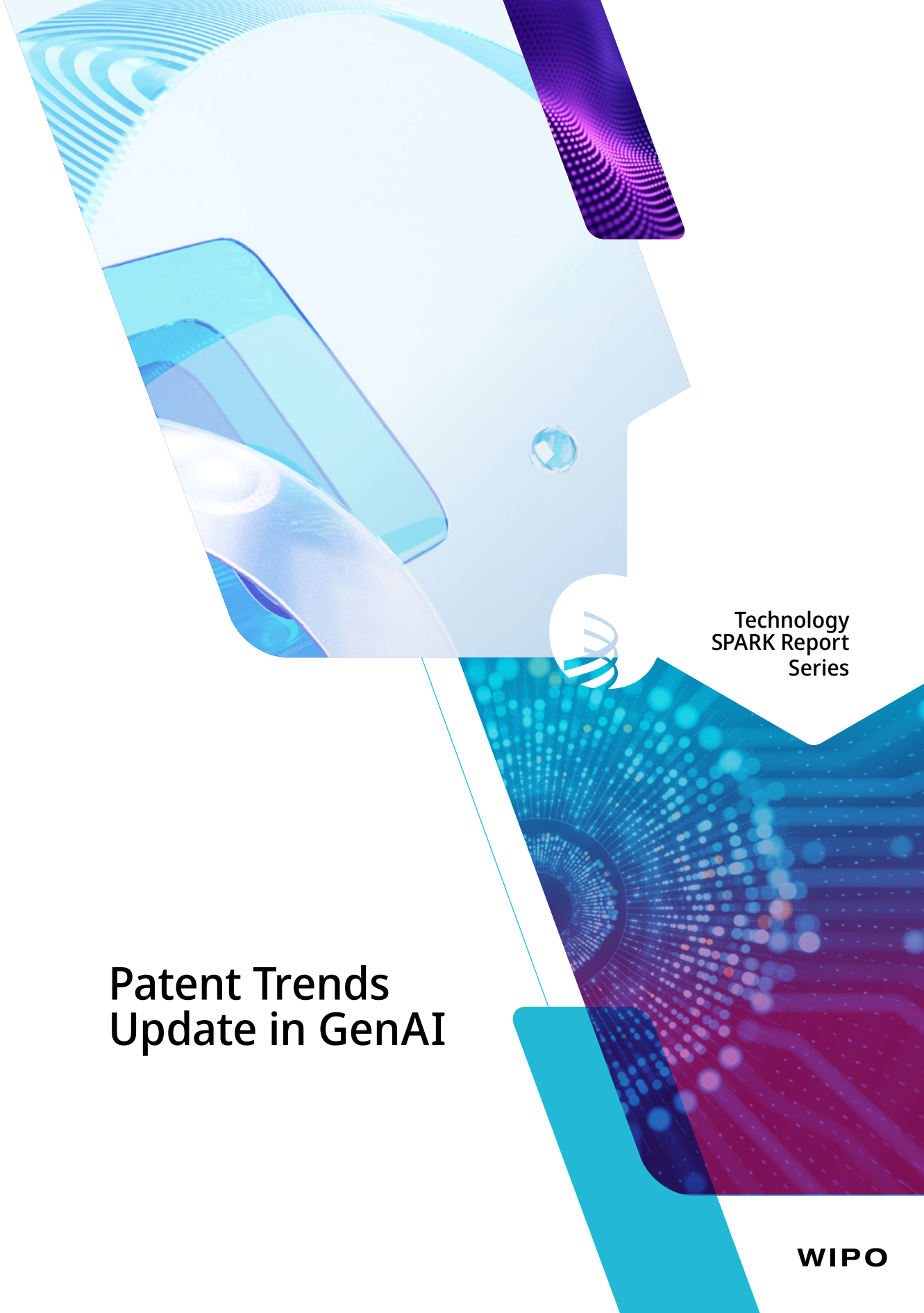




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Patent Trends Update in GenAI

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Patent Trends Update in GenAI

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Executive summary

This WIPO Technology SPARK (Short Pieces of Analysis, Research and Knowledge) Report provides an update to the WIPO *Patent Landscape Report: Generative Artificial Intelligence* (GenAI).¹ The 2024 Patent Landscape Report covered a period of 10 years from 2014 to 2023. This Technology SPARK Report now extends the patent analysis through to 2025. It highlights the most significant developments in GenAI patenting over the past two years – a period in which the field has moved from early-stage experimentation to large-scale commercial deployment across a widening range of industries and applications.

The original report from 2024 anticipated that the post-ChatGPT surge in research and development would translate into accelerating patent activity as the typical 18-month filing-to-publication lag closed. The updated figures for 2025 confirm this, with GenAI patenting activity accelerating at an unprecedented pace. The number of published patent families (a measure for new inventions) in GenAI rose from approximately 14,000 in 2023 to over 37,000 in 2025. In total, more than 56,000 new GenAI patent families were published in 2024 and 2025 alone – exceeding the entire cumulative output of the preceding decade (2014 to 2023). GenAI now accounts for 8.7% of all artificial intelligence (AI) published patent families, up from 6.1% in 2023.

The ranking of top patent owners has shifted significantly. SoftBank has emerged as the largest single GenAI patent holder by volume, with nearly 3,000 patent families published – almost entirely in 2025 – driven by its broad AI infrastructure and investment strategy. The Chinese leaders – Tencent, Ping An and Baidu – remain among the largest cumulative patent owners. Alphabet (Google) has become the largest US-based GenAI patent owner. Notable new entrants in the top 25 GenAI patent owners include State Grid Corporation of China, Nvidia, Inspur Group and Bosch.

China continues to dominate in GenAI patenting volume, but the growth is becoming more global. China-based inventors published over 43,000 GenAI patent families in 2024 and 2025, more than the country's entire output from 2014 to 2023. However, several other countries posted even higher relative growth rates, including the United States (92% compound annual growth rate), Japan (210%), Germany (85%), Canada (109%) and Switzerland (124%).

Large language models (LLMs) have overtaken generative adversarial networks (GANs) as the dominant GenAI model type. In 2025, LLM patent families outnumbered GANs by nearly three to one (14,100 patent family publications versus 5,200). Diffusion models have also grown rapidly and now rank third. This shift reflects the transition from a GenAI field that is centered

1 World Intellectual Property Organization (WIPO) (2024). Generative Artificial Intelligence. Patent Landscape Report. Geneva: WIPO. <https://www.wipo.int/web-publications/patent-landscape-report-generative-artificial-intelligence-genai/en/index.html>

on adversarial image generation² to one driven by large-scale language and multimodal models. As a result, text is also increasingly catching up with image/video as the leading data mode. Software/code and 3D modeling are among the fastest-growing smaller data type categories, reflecting the broadening range of GenAI applications.

As GenAI technologies continue to mature and spread into new industries and application domains, the patent landscape is likely to keep expanding and the strategic importance of understanding it will only grow. For policymakers, businesses and intellectual property (IP) professionals, the message from this 2026 WIPO update is clear: the GenAI patent landscape is evolving faster than ever, and the strategic decisions being made now – about where to file, what to protect and how to navigate an increasingly crowded field – will shape competitive positions for years to come.

² Adversarial image generation – the approach underlying generative adversarial networks (GANs) – relies on two neural networks trained in competition with one another: a generator that produces synthetic images and a discriminator that attempts to distinguish generated images from real ones. Through this adversarial training process, both networks improve over time, enabling the generator to produce increasingly realistic images

Introduction

When the WIPO *Patent Landscape Report: Generative Artificial Intelligence*¹ was published in 2024, based on an analysis of published patent applications up to the end of 2023, the field was already moving at extraordinary speed. The release of OpenAI's ChatGPT in November 2022 had triggered what many described as an "iPhone moment" for GenAI: a sudden, visible shift in how the public, industry and policymakers perceived the technology.

The last two years have shown no sign of deceleration. On the contrary, the data now available prove that the GenAI patent landscape has continued to expand at an even faster pace. With tens of thousands of new patent families published in 2024 and 2025, the field has entered a new phase of technological maturity and commercial urgency.

Several technological developments have shaped the GenAI landscape over the last two years and have boosted patenting activity around the world. Following the broad public adoption of large language models (LLMs), 2024 saw a shift toward models capable of processing and generating content across multiple modalities – text, images, audio, video and code within a single system. The release of new ChatGPT versions,² Alphabet's (Google's) Gemini family³ and Anthropic's Claude series⁴ established multimodal capability as the baseline expectation for frontier models – the leading-edge AI systems that represent the current state of the art.

A new architectural paradigm gained prominence in late 2024 with the release of OpenAI's o1 series⁵ and comparable models from other developers. These systems extend computation at inference time, allowing models to "think" through complex problems step by step before producing a response, rather than relying solely on capabilities encoded during training. This approach has led to substantial performance gains on scientific, mathematical and coding-related benchmarks, and represents a new frontier for patenting activity around reasoning systems, inference-time scaling and model efficiency.⁶

- 1 World Intellectual Property Organization (WIPO) (2024). *Generative Artificial Intelligence. Patent Landscape Report*. Geneva: WIPO. <https://www.wipo.int/web-publications/patent-landscape-report-generative-artificial-intelligence-genai/en/index.html>
- 2 OpenAI (2024). Hello GPT-4o. Available at: <https://openai.com/index/hello-gpt-4o/> (accessed May 29, 2026)
- 3 Pichai, S. and Hassabis, D. (2024). Our next-generation model: Gemini 1.5. Google. Available at: <https://blog.google/innovation-and-ai/products/google-gemini-next-generation-model-february-2024/#sundar-note> (accessed May 29, 2026)
- 4 Anthropic (2024). Introducing the next generation of Claude. Available at: <https://www.anthropic.com/news/claude-3-family> (accessed May 29, 2026)
- 5 OpenAI (2024). Learning to reason with LLMs. Available at: <https://openai.com/index/learning-to-reason-with-llms/> (accessed May 29, 2026)
- 6 Balachandran, V. *et al.* (2024). Inference-time scaling for complex tasks: Where we stand and what lies ahead. Available at: <https://www.microsoft.com/en-us/research/publication/inference-time-scaling-for-complex-tasks-where-we-stand-and-what-lies-ahead/> (accessed May 29, 2026)

The widespread release of capable open-weight models⁷ – most notably Meta’s Llama family⁸ – democratized access to frontier-level GenAI, enabling a much wider ecosystem of companies, research institutions and individual developers to build and innovate on top of foundation models. This trend was further accelerated by the emergence in early 2025 of highly efficient models from DeepSeek,⁹ which demonstrated that competitive reasoning performance could be achieved at a fraction of the costs previously assumed for training models.

Perhaps the most widely discussed GenAI trend of 2025 has been the rise of agentic artificial intelligence (agentic AI) – systems that can autonomously plan, execute multi-step tasks and adapt their behavior based on real-time feedback loops, with minimal human oversight. Unlike earlier GenAI tools that respond to individual prompts, agentic systems can deconstruct complex goals into sequences of actions, use external tools and data sources, and iteratively refine their outputs.¹⁰ While agentic AI is still a nascent field, early patenting activity is already visible, with companies such as Alphabet (Google) and Nvidia among the first movers. As these systems mature, they are likely to become an increasingly important category within the GenAI patent landscape.

This WIPO Technology SPARK Report on GenAI serves as an update of the 2024 WIPO Patent Landscape Report. It is based on the same analytical framework, examining GenAI patents from different perspectives by analyzing global trends, top inventor countries and top patent owners, as well as major GenAI models and modes. Where the original report covered patent data from 2014 to 2023, this update extends the analysis through to 2025, incorporating the most recent patent publication data available. The focus is on what is new: how rankings have shifted, which trends have accelerated or moderated, and what the data for 2024 and 2025 reveal about the direction in which the field is heading.¹¹

- 7 Open-weight models are AI models for which the trained parameters (weights) are publicly released, allowing developers to download, study, fine-tune and deploy the model on their own infrastructure. They differ from fully open-source AI systems, where the training code, datasets, and documentation are also released. See OECD (2025). AI openness: Balancing innovation, transparency and risk in open-weight models. Available at: <https://oecd.ai/en/work/balancing-innovation-transparency-and-risk-in-open-weight-models> (accessed June 05, 2026)
- 8 Meta (2024). Introducing Llama 3.1: Our most capable models to date. Available at: <https://ai.meta.com/blog/meta-llama-3-1> (accessed May 29, 2026)
- 9 DeepSeek-AI *et al.* (2025). DeepSeek-R1: Incentivizing reasoning capability in LLMs via reinforcement learning. Available at: <https://arxiv.org/abs/2501.12948> (accessed May 29, 2026)
- 10 Abou Ali, M., Dornaika, F. and Charafeddine, J. (2026). Agentic AI: a comprehensive survey of architectures, applications, and future directions. *Artificial Intelligence Review*, 59(11). Available at: <https://link.springer.com/article/10.1007/s10462-025-11422-4> (accessed May 29, 2026)
- 11 For a comprehensive overview of the GenAI patent landscape, including detailed methodology and background on the technology, please refer to the full WIPO Patent Landscape Report on GenAI published in 2024. See World Intellectual Property Organization (WIPO) (2024). Generative Artificial Intelligence. Patent Landscape Report. Geneva: WIPO. <https://www.wipo.int/web-publications/patent-landscape-report-generative-artificial-intelligence-genai/en/index.html>

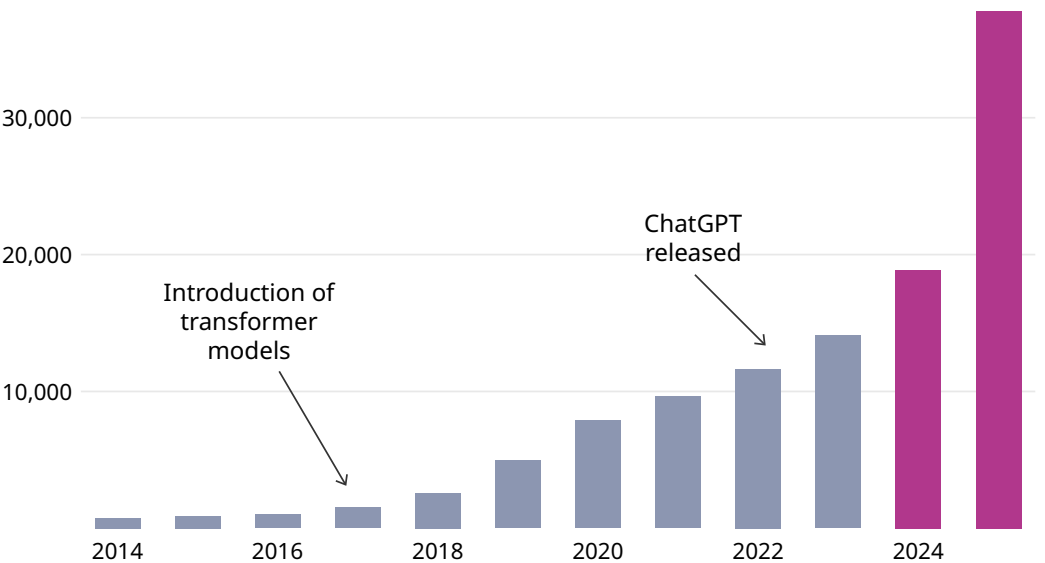
Global patenting trends

Accelerating GenAI patenting activity

While the post-2017 growth in GenAI patenting documented in the 2024 WIPO Patent Landscape Report was already remarkable – averaging about 45% annually in the years following the introduction of the transformer architecture (2017–2023) – the latest data reveal a further acceleration. GenAI inventions (measured in terms of published patent families) roughly doubled between 2024 and 2025 (from 18,862 in 2024 to 37,808 in 2025), a growth rate that far surpasses the long-term average of 43% annually since 2014. The 2024 report anticipated this trend, noting that the surge in public interest and scientific research following the launch of ChatGPT in late 2022 would translate into increased patent activity with a time lag, given the typical 18-month lag between patent filing and publication. The 2024 and 2025 figures confirm this: the wave of GenAI research and development triggered by the release of ChatGPT in late 2022 and the broader commercial interest in LLMs is now fully materializing in the patent data.

GenAI patent family publications have surged, with 2024 and 2025 data confirming the accelerating post-ChatGPT innovation wave.

Figure 1 Development of global GenAI inventions, measured in number of published patent families by earliest publication year, 2014–2025



Source: WIPO, based on patent data from EconSight/IFI Claims, March 2026.

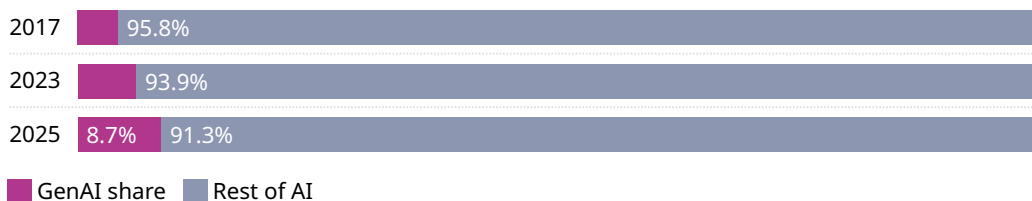
A look at international patent families (IPFs) – patents that have been published in two or more jurisdictions – provides an additional perspective. IPFs are a useful indicator of the patents that applicants consider most commercially valuable, as the decision to bear the cost of filing in multiple countries typically reflects a strong intention to seek commercialization. The number of IPFs in GenAI has grown from 1,931 in 2023 to 3,297 in 2025. However, IPFs remain a small fraction of the total number of GenAI patent families, accounting for approximately 9% of all GenAI patent family publications in 2025. This gap is partly explained by the geographic composition of the published GenAI patent families, as discussed later. China accounts for the majority of global GenAI patent publications, but Chinese applicants typically file most of their patents domestically. The relatively young age of many GenAI patent portfolios is also a factor: applicants often file first in their domestic market and then include additional jurisdictions at a later stage, meaning that recently published patents may become IPFs as they mature.

GenAI is a growing share of all AI patenting activity

While GenAI remains a subset of the very dynamic broader AI patent landscape, its relative importance has continued to increase. In 2025, GenAI patent family publications accounted for approximately 8.7% of the total of more than 435,000 AI patent family publications, up from 6.1% in 2023 and 4.2% in 2017. As GenAI technologies – particularly LLMs, diffusion models and multimodal systems – continue to find their way into an expanding range of products and applications, the GenAI share of total AI patenting is expected to continue its upward trajectory.

The GenAI share of total AI patenting reached a new high of 8.7% in 2025, up from 4.2% in 2017 and 6.1% in 2023.

Figure 2 GenAI share of total AI patent family publications, 2017–2025



Source: WIPO, based on patent data from EconSight/IFI Claims, March 2026.

Top patent owners

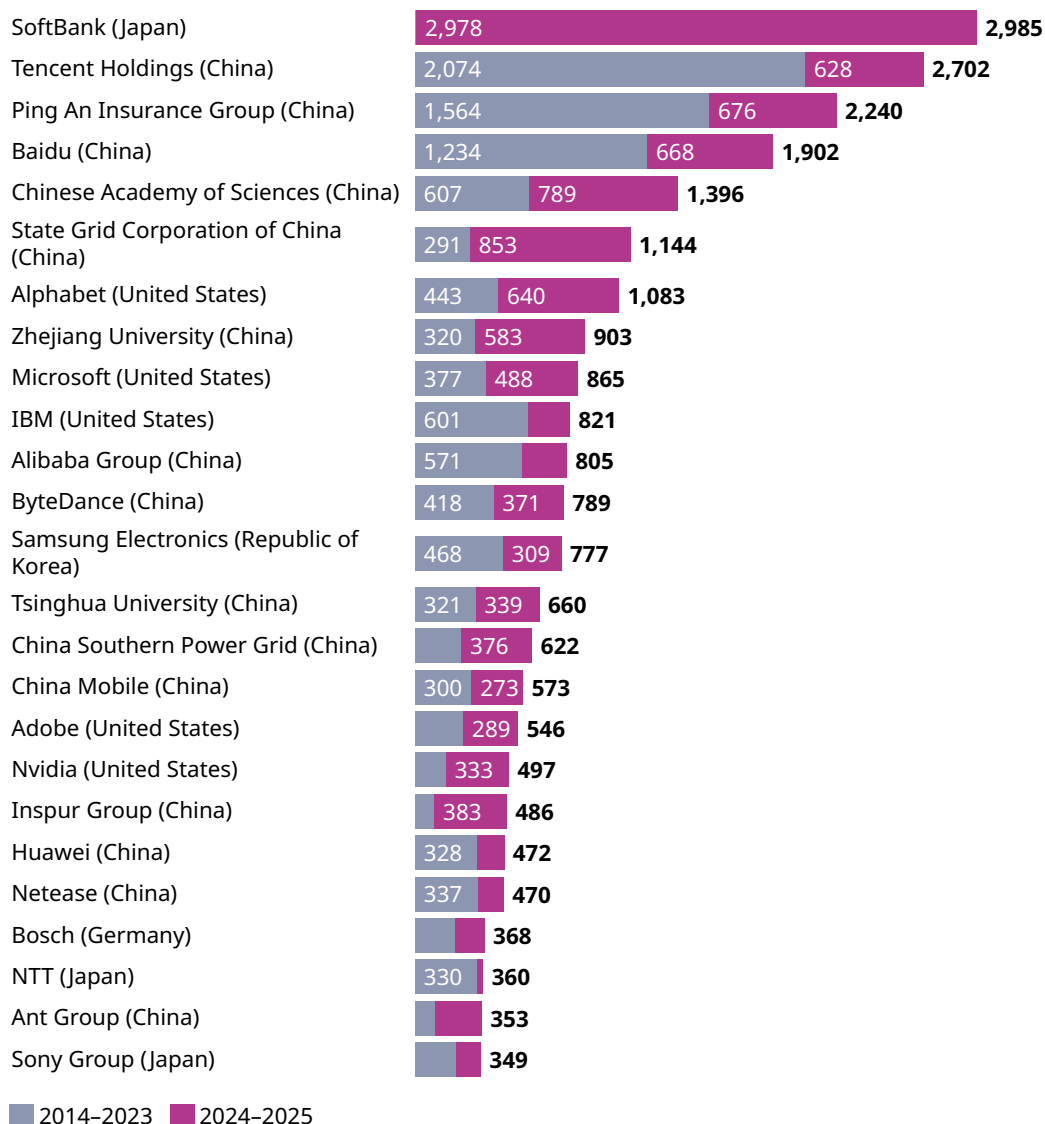
The most striking change in the ranking of top GenAI patent owners is the emergence of the Japanese company SoftBank as the single largest patent holder. It had 2,985 patent families published between 2014 and 2025 – virtually all of which were filed in 2023 and published in 2025. This extraordinary growth aligns with SoftBank's broad strategic pivot toward AI. The company has invested heavily in AI infrastructure – including constructing large-scale graphics processing unit (GPU) computing platforms in Japan and taking a leading role in the Stargate data center initiative in the United States¹ – and is one of the largest financial backers of OpenAI.² SoftBank has also begun developing its own Japanese-language LLM, called Sarashina, through its subsidiary SB Intuitions.³ SoftBank's patent activity appears to signal the arrival of a new type of GenAI patent owner – a telecommunications and investment conglomerate pursuing a vertically integrated AI strategy that spans infrastructure, models and applications.

The Chinese companies that dominated the 2024 report rankings – Tencent, Ping An and Baidu – remain among the largest cumulative patent holders. Several organizations have climbed significantly in the rankings compared with the 2024 report. State Grid Corporation of China – the world's largest utility company by number of customers served and workforce⁴ – has risen to become a major GenAI patent owner. It holds 1,144 patent families, of which 853 were published in 2024 and 2025, reflecting the growing application of GenAI in energy grid optimization, predictive maintenance and infrastructure planning. The Chinese Academy of Sciences remains the leading research organization, with 1,396 patent families, while Zhejiang University (903) has also moved up the rankings substantially.

- 1 Tomás, J.P. (2025). SoftBank aims to lead artificial super intelligence era. Available at: <https://www.rcrwireless.com/20250630/ai-infrastructure/softbank-artificial> (accessed May 29, 2026)
- 2 SoftBank Group (2026). Follow-on investments in OpenAI. Available at: <https://group.softbank/en/news/press/20260227> (accessed May 29, 2026)
- 3 SoftBank News (2025). Sovereign AI as a Growth Driver: Message from Head of Homegrown Generative AI Development in SoftBank Corp. Integrated Report 2025. Available at: https://www.softbank.jp/en/sbnews/entry/20251113_01 (accessed May 29, 2026)
- 4 World Benchmarking Alliance (n.d.). State Grid Corporation of China. Available at: <https://www.worldbenchmarkingalliance.org/company/state-grid-corporation-china> (accessed May 29, 2026)

Despite continued growth from the top Chinese players, SoftBank is now the largest GenAI patent owner.

Figure 3 Top 25 patent owners in GenAI, by number of published patent families, 2014–2023 vs. 2024–2025



Source: WIPO, based on patent data from EconSight/IFI Claims, March 2026.

Among companies based in the United States, Alphabet (Google) (1,083 patent families) has strengthened its position, becoming the largest US-based GenAI patent owner and the leading US applicant in terms of recent filings (640 in 2024 or 2025). Microsoft (865) and IBM (821) follow in second and third places, although IBM's recent filing rate (220 in 2024 or 2025) is comparatively lower. Nvidia (497 patent families, with 333 in 2024 or 2025) is a notable new entrant in the top 25, reflecting its expanding role beyond GPU hardware into AI software, frameworks and model architectures. Adobe (546) also continues to build its GenAI portfolio.

New entrants in the ranking also include: China Southern Power Grid (622 patent families); Inspur Group (486), a major Chinese server and cloud computing provider; and Bosch (368), which represents the growing engagement of European industrial companies in GenAI patenting. Ant Group (353), the fintech affiliate of Alibaba, also appears in the top 25 GenAI patent owners.

The 2024 report noted that OpenAI – the company behind ChatGPT – had only just begun to file patents. Since then, OpenAI has continued to build its patent portfolio, although it remains modest in comparison with other leading GenAI companies. As of late 2025, OpenAI held 35 patent filings globally, a tiny fraction compared with the thousands of published patents held by companies like Alphabet (Google), Microsoft or Tencent. Its patents focus on specific product-level innovations – multimodal interfaces, code generation, image generation and text editing – rather than foundational model architectures. OpenAI's approach suggests a continued reliance on trade secrets and speed of execution as its primary competitive advantages, with patents serving a complementary role.

Top inventor locations

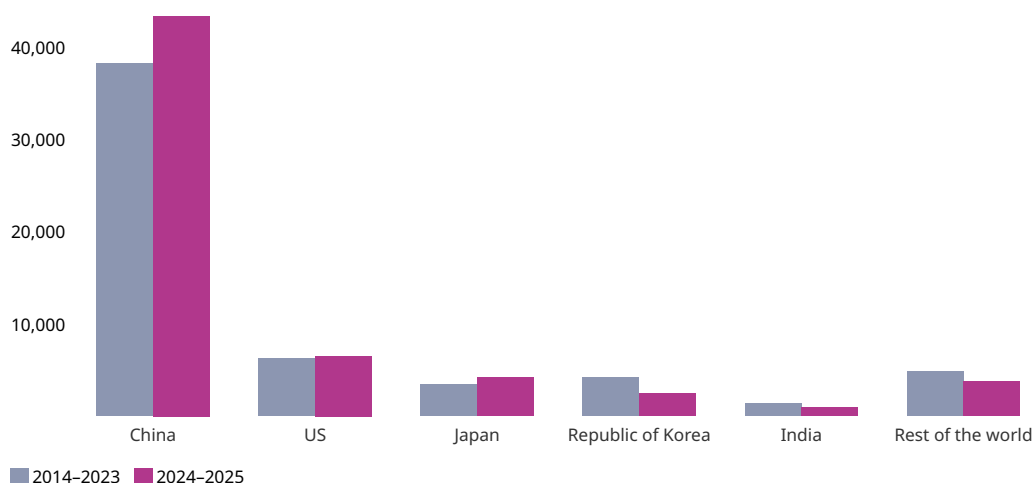
China remains firmly at the forefront of global patenting activity in GenAI. China's output has continued to accelerate, with over 43,000 patent families published in 2024 and 2025 alone, more than its entire cumulative output over the preceding 10 years (2014 to 2023). China's compound annual growth rate (CAGR) for patent families is 64% between 2023 and 2025, which demonstrates that its dominance is not merely a legacy of early filing volume but reflects sustained and intensifying research activity.

The United States remains the second most important research location. The number of US patent families rose from about 1,185 in 2023 to over 4,380 in 2025, suggesting that the wave of commercial GenAI development led by US companies is now translating into a significant acceleration in patenting activity.

A remarkable shift seen in the updated data is the rise of Japan, which has moved from fourth to third place among inventor locations, overtaking the Republic of Korea. Japan's patent output jumped from just 398 patent families in 2023 to 3,835 in 2025 – showing a CAGR of 210%, by far the highest among the top inventor locations. This dramatic increase is largely attributable to the patenting activity of SoftBank, which published nearly 3,000 GenAI patent families in 2024 and 2025, as discussed previously. Without SoftBank's contribution, Japan's growth would be significantly more modest.

China continues to dominate the GenAI patent landscape, but patent growth has been more dynamic in the United States and Japan. Out of the top 10 inventor locations, 7 have seen more GenAI patent families published in the last 2 years than their entire cumulative output over the preceding 10 years.

Figure 4 Development of GenAI published patent families in key inventor locations, 2014–2023 vs. 2024–2025



Source: WIPO, based on patent data from EconSight/IFI Claims, March 2026.

The Republic of Korea has dropped from third to fourth place, with a more moderate growth rate in published patent families (21% CAGR between 2023 and 2025). India (fifth) continues to show strong growth (63% CAGR), consistent with the high growth rates already noted in the 2024 report.

Among European locations, Germany (sixth place) has now clearly overtaken the United Kingdom (eighth place) and has established itself as the leading European inventor location for GenAI. Both countries have shown strong recent growth rates (85% CAGR for Germany, 69% for the UK), but Germany's larger base and faster acceleration have widened the gap observed in the 2024 report.

Overall, the geographic concentration of GenAI patenting remains high. The top four inventor locations alone (China, the United States, Japan and the Republic of Korea) account for the vast majority of global GenAI patent family publications. However, it should be noted that some patent families list inventors from more than one country, meaning that country-level figures contain a degree of overlap. The updated data also reveal that the growth in GenAI patenting is becoming more broadly distributed, with several key countries, including the United States, Japan, Germany, Canada and Switzerland, posting CAGR figures above 80%, narrowing the gap with China in relative terms even as China continues to lead in absolute volume.

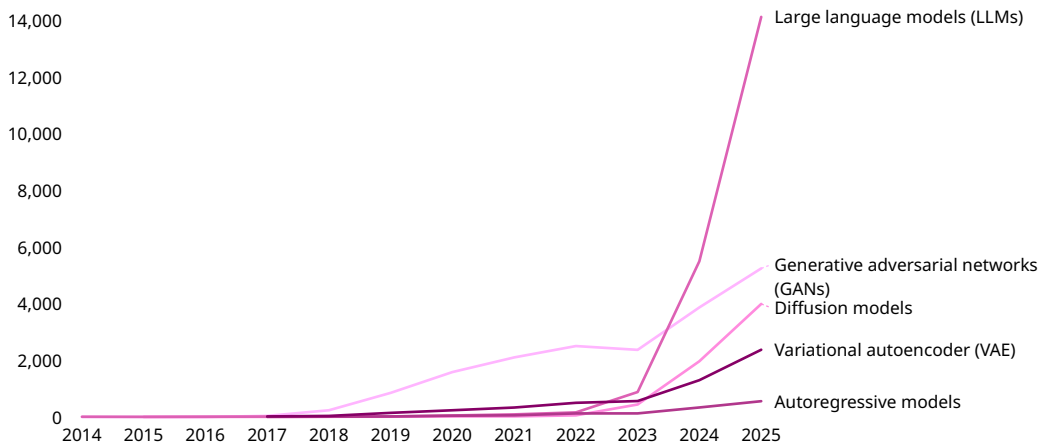
Main GenAI models

As in the 2024 report, all identified GenAI patent families were assigned to five different model types based on information from patent abstracts, claims or titles. However, not all GenAI patent families fit into a specific model type, as some patents focus on describing the use case rather than the underlying model architecture.

A significant change in the updated data is that LLMs have overtaken generative adversarial networks (GANs) as the largest GenAI model category by patent volume. Between 2014 and 2025, approximately 20,900 patent families were published in the LLM category, compared with about 18,800 for GANs. This reversal was already foreshadowed in the 2024 report, which noted the rapid growth of LLM patents and the slowing momentum of GAN filings, but the speed at which LLMs have moved ahead is noteworthy. In 2023, LLM patent families (881) were still well below GANs (2,370). By 2025, LLMs had increased to over 14,100 patent families – nearly three times the number of GAN patents published in the same year (5,245).

Large language models (LLMs) are now the central model type driving the GenAI wave, overtaking generative adversarial networks (GANs).

Figure 5 Development of GenAI inventions in five GenAI core models, measured in number of published patent families by earliest publication year, 2014–2025



Source: WIPO, based on patent data from EconSight/IFI Claims, March 2026.

This shift reflects the broader technological transition in the GenAI field. While GANs were the dominant generative model for much of the past decade, particularly for image synthesis and data augmentation, the transformer-based architectures underpinning LLMs have become the central technology driving the current GenAI wave. The commercial success of LLM-based products, such as ChatGPT, Gemini, Claude and others, has clearly translated into increased patenting activity. GANs remain relevant in specific applications of AI, such as image enhancement, synthetic data generation and real-time inference tasks, but they are no longer at the technological forefront of GenAI research and development.

Diffusion models have also experienced strong growth, rising from 441 patent families in 2023 to nearly 4,000 in 2025. These models, which underpin widely used image and video generation tools, are now the third largest model category by patent volume (approximately 6,500 patent

families in total), having overtaken variational autoencoders (VAEs). VAEs themselves have also grown substantially – from 562 patent families in 2023 to over 2,370 in 2025.

Autoregressive models remain the smallest category, with about 1,280 patent families in total between 2014 and 2025. As noted in the 2024 report, there is inherent overlap between autoregressive models and LLMs, since LLMs are by definition autoregressive. The relatively weak growth in the autoregressive category (from 126 in 2023 to 557 in 2025) is likely to reflect a terminological shift: as LLMs have become the dominant framing in both academic research and industry, patent applicants appear to be using the term “large language model” rather than “autoregressive model” in their filings.

Overall, the data show that the patent landscape has moved decisively from a GAN-dominated era to one led by LLMs and, increasingly, diffusion models. This mirrors the broader technological evolution of GenAI – from a field centered on adversarial image generation to one defined by large-scale language and multimodal models with wider application potential.

Main GenAI modes

GenAI models can use many different types, or modes, of input and output data, such as text, image/video, speech/voice/music and others.⁵ Among the different GenAI modes, image/video remains the largest category. Between 2014 and 2025, there were approximately 40,000 published patent families using this mode, with over 13,800 published in 2025 alone. At first glance, this may seem at odds with the finding in the previous section that LLMs have overtaken GANs as the leading model type. However, the image/video mode is used by patent families from several model categories, including GANs, diffusion models, VAEs and multimodal LLMs, whereas LLM patents are distributed across multiple modes, including text, code, speech/voice/music and image/video. The continued lead of image/video as a mode therefore reflects its broad technological base, across several model architectures, even as the underlying models themselves are shifting.

A notable development in the updated data for 2024 and 2025 is the rapid rise of text as a mode. Text-related patent families grew from approximately 3,400 in 2023 to nearly 11,800 in 2025, more than tripling in just two years. This surge closely mirrors the strong growth in LLM-related patents and reflects the central role that text generation, processing and understanding now plays in the GenAI ecosystem.

The speech/voice/music category has fallen behind in terms of patent growth dynamics, with patent families using this mode declining in 2024 before recovering to 3,538 in 2025. This relative slowdown is seemingly at odds with the active commercial development of voice and audio AI technologies in 2024 and 2025, including real-time speech-to-speech models, AI voice cloning and AI music generation tools. One possible explanation is a classification effect: as modern voice and audio systems are increasingly built on top of multimodal LLMs, rather than using dedicated speech architectures, related patents may be classified under text or other modes rather than speech/voice/music.

Software/code has emerged as one of the fastest-growing modes in relative terms. Patent families in this category rose from 339 in 2023 to 1,616 in 2025, reflecting the growing

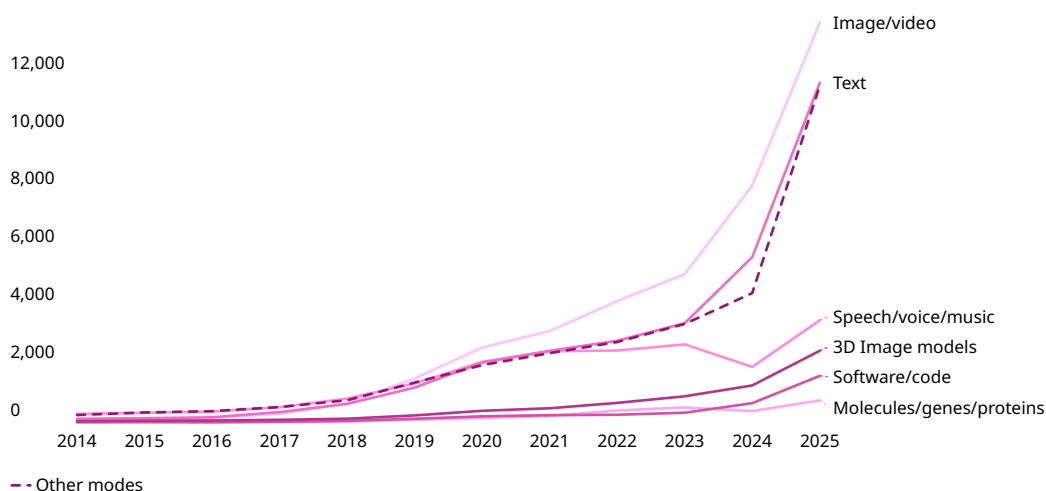
⁵ Some patent families are assigned to more than one mode, as an increasing number of GenAI models – particularly multimodal large language models (MLLMs) – can process and generate multiple types of data simultaneously. However, there are also patent families that cannot be clearly assigned to any specific mode

importance of AI-assisted code generation tools and the integration of GenAI into software development workflows. While still a comparatively small category in absolute terms, its recent trajectory suggests that it will continue to gain prominence. 3D image modeling has also shown strong growth, rising from 908 patent families in 2023 to 2,484 in 2025. This growth aligns with increasing interest in GenAI applications for 3D content creation, virtual environments, gaming and product design.

The molecules/genes/proteins category – highlighted in the 2024 report as one of the fastest-growing modes – has shown more uneven growth in recent years, with 523 patent families in 2023, a dip to 397 in 2024, and a recovery to 766 in 2025. While this remains a relatively small category, it continues to reflect the growing application of GenAI in drug discovery, protein design and the life sciences more broadly.

Among the different GenAI modes, most patent families belong to the image/video category, but text and other modes are increasingly catching up.

Figure 6 Development of GenAI inventions in the different GenAI modes, measured in number of published patent families by earliest publication year, 2014–2025



Source: WIPO, based on patent data from EconSight/IFI Claims, March 2026.

Key takeaways and what comes next

The updated patent data over the past two years confirm that GenAI has entered a new phase of technological and commercial development. What emerged as an acceleration in the 2024 *WIPO Patent Landscape Report: Generative Artificial Intelligence*¹ has now become a full-scale spike in patenting activity. The publication of more than 56,000 new GenAI patent families in 2024 and 2025 alone – exceeding the total published over the previous 10 years – illustrates how rapidly the field is expanding, as companies move from experimentation toward large-scale deployment.

Several structural shifts in the GenAI patent landscape are also becoming clearer. LLMs have emerged as the dominant architectural model, overtaking earlier generative approaches such as GANs. Diffusion models and multimodal systems are expanding the innovative scope of GenAI, while emerging technologies such as reasoning models and agentic systems are beginning to appear in patent filings. At the same time, the range of actors participating in GenAI patenting is broadening, with telecommunications firms, infrastructure providers, industrial companies and utilities joining traditional software and internet companies as leading applicants.

The geographic distribution of innovation also continues to evolve. China remains the largest source of GenAI patent publications by a wide margin, but strong recent growth in the United States, Japan and several European countries suggests that the global innovation landscape is becoming more dynamic. Japan's rapid rise in recent patent activity illustrates how the entry or strategic shift of a single major player can reshape national innovation statistics within a short period.

At the same time, several characteristics of the patent landscape highlight the relatively early stage of commercialization. International patent families (IPFs) still account for a small share of GenAI filings, indicating that many inventions remain concentrated in domestic markets or have not yet reached the stage where applicants pursue global protection strategies. As GenAI applications mature and business models stabilize, it is likely that a greater share of patents will be extended internationally.

Looking ahead, the pace of change in GenAI suggests that the patent landscape will continue to evolve rapidly. Areas such as multimodal systems, reasoning-oriented models and AI agents, as well as efficiency improvements in training and inference, are likely to become increasingly important directions for both research and patenting. In addition, the integration of GenAI into sectors such as healthcare, manufacturing, finance and energy is likely to expand the diversity of actors filing patents in this field.

¹ World Intellectual Property Organization (WIPO) (2024). Generative Artificial Intelligence. Patent Landscape Report. Geneva: WIPO. <https://www.wipo.int/web-publications/patent-landscape-report-generative-artificial-intelligence-genai/en/index.html>

For policymakers, businesses and IP professionals, the implications are clear. The GenAI patent landscape is becoming larger, more global and more strategically significant. Monitoring these developments will remain essential for understanding technological trajectories, competitive dynamics and the evolving role of IP in one of the fastest-moving fields of innovation ever observed.

Appendix

This WIPO Technology SPARK Report is based on the 2024 WIPO *Patent Landscape Report: Generative Artificial Intelligence*.¹ The Appendix of the 2024 report should be considered an integral part of this publication.

¹ World Intellectual Property Organization (WIPO) (2024). Generative Artificial Intelligence. Patent Landscape Report. Geneva: WIPO. <https://www.wipo.int/web-publications/patent-landscape-report-generative-artificial-intelligence-genai/en/index.html>

Generative artificial intelligence (GenAI) is rapidly reshaping the technological landscape, driving innovation across industries from software and media to healthcare, finance and manufacturing.

This WIPO Technology SPARK Report provides an updated snapshot of global patenting activity in GenAI, building on the 2024 WIPO *Patent Landscape Report: Generative Artificial Intelligence*. Extending the analysis through 2025, the report highlights how the wave of research and development triggered by the emergence of large language models and generative systems is now materializing in the patent data.