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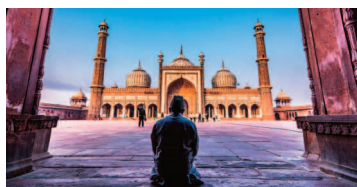
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India: patent eligibility of AI-related inventions

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In the 2023 financial year, as reported by Development Bank of Singapore (DBS) Limited, India's software exports reached a record high of USD \$320 billion, and India's total share in global computer services exports increased to about 11%.

This surge in software exports was primarily driven by the invigorated research and commercial interest in the development of artificial intelligence (AI)-based software, particularly in the field of computers, information technology, image processing, and telecommunications. The growth in such AI-based software production was also due to the advancement in machine

learning, increased access to big data, and improvements in computing hardware.

The rising tide of AI-based software applications is profoundly transforming the landscape of technology development in the country. The capacity of algorithms to optimise and automate increasingly complex tasks has led to a surge in productivity in some traditional industries and radical disruption in others. The result of this is new industrial activity and innovation, occurring on a scale that has a direct and measurable impact on patent filings too. The following chart shows a positive trend of increased patent filings at the Indian Patent Office (IPO) for AI-related inventions.

Indians filing AI patents in various countries

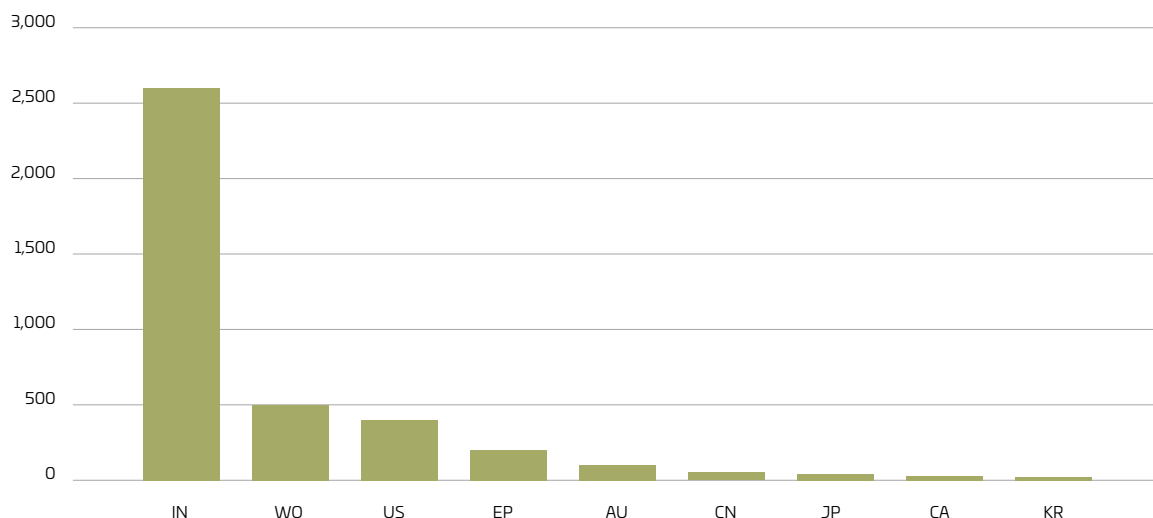
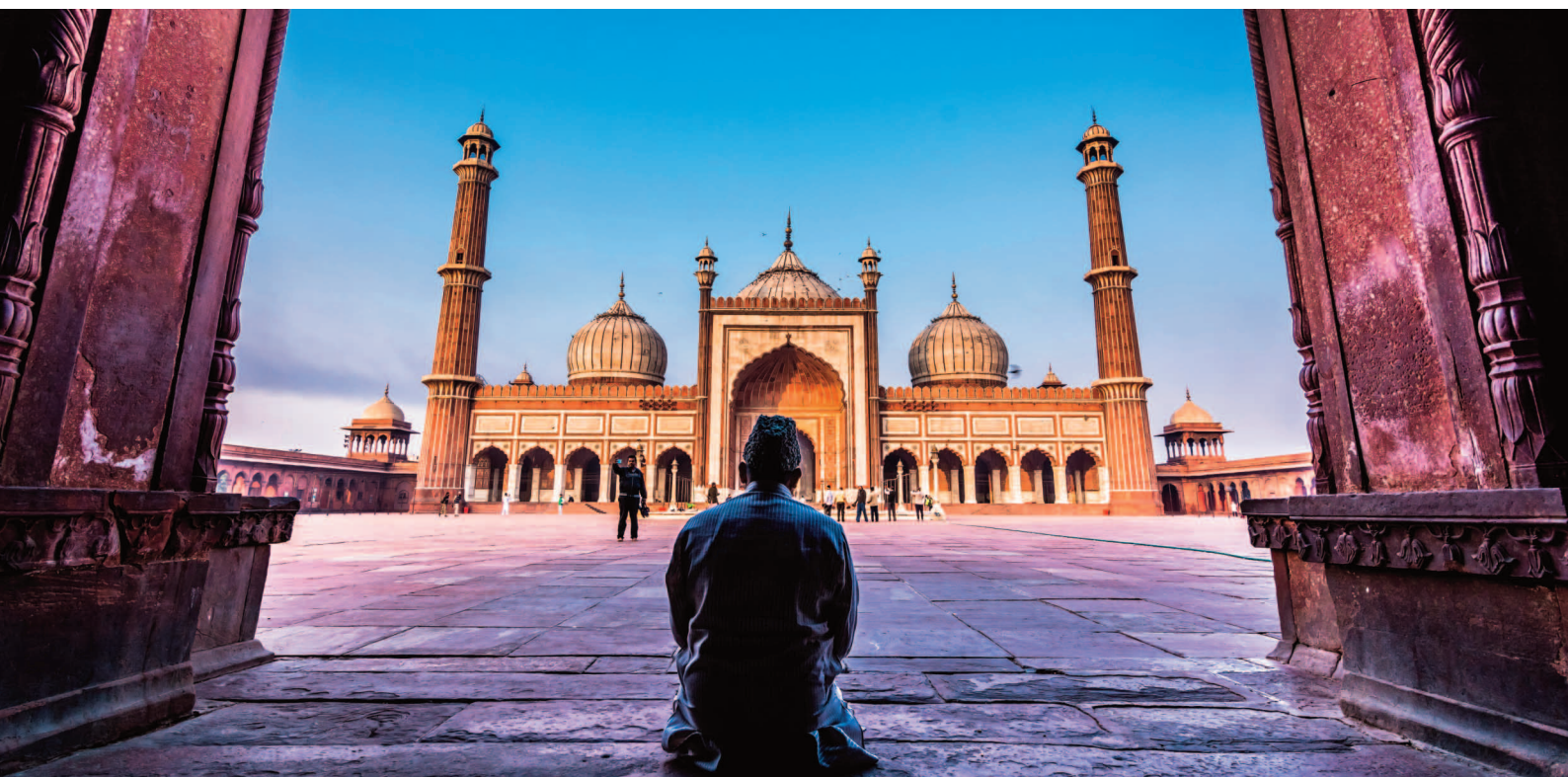


Image courtesy: <https://brainiac.co.in/artificial-intelligence-and-patenting-in-india>



The patentability of computer-implemented and AI inventions

Not only in India but also in other parts of the world, the increase in patent filings related to CRI (computer related inventions) and AI has prompted several patent offices to revisit their respective patentability requirements of software. The primary reason for this being that these inventions fall within the ambit of excluded subject matter.

For example, at the most basic level, software code instructs the AI system to perform actions, make decisions, and determine outputs based on pre-existing commands, such as “if a condition is true, then [perform the following action].” Once many such commands are aggregated into a computer programme, the software can provide outputs without further instruction when the AI system is provided with data as the input.

Therefore, the bigger question is how to examine patent applications of inventions related to CRI and AI. Like any inventions, CRIs and AI inventions must meet the fundamental legal requirements of novelty, inventive step, and industrial application to be patentable. The IPO does not positively define what an invention is; rather it provides a non-exhaustive list of “non-inventions”, defining subject matter and activities that are excluded from patentability to the extent that they relate to the subject matter as given under Section 3(k) and 3(m) of the Indian Patents Act, 1970:

- Section 3(k): “a mathematical or business method or a computer programme per se or algorithms”; and

- Section 3(m): “a mere scheme or rule or method of performing mental acts or a method of playing a game”.

In practice, the test to determine whether the subject matter defined in the claims of a patent application is considered an invention, requires demonstrating the presence of any “technical contribution” and “technical effect” in the claimed subject matter.

This has been once again reasserted by the Hon’ble Delhi High Court (DHC) in *Microsoft Technology Licensing, LLC Vs The Assistant Controller Of Patents And Designs, C.A.(COMM.IPD-PAT) 29/2022*:

“The Court would thus reinforce the views expressed in *Ferid Allani* (supra) concerning the meaning of the term “computer program per se” in Section 3(k) of the Act. The patent applications should be considered in the context of established judicial precedents, Section 3(k) of the Act, extant guidelines related to CRIs, and other materials that indicate the legislative framework.

“If a computer-based invention provides a technical effect or contribution, it may still be patentable. The technical effect or contribution can be demonstrated by showing that the invention solves a technical problem, enhances a technical process, or has some other technical benefit. The mere fact that an invention involves a mathematical or computer-based method does not automatically exclude it from being patentable. The invention can still satisfy the patentability requirements, including the requirement for a technical effect or contribution, to be eligible for patent protection. In



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Shraddha is a competent and dynamic professional with a distinguished and insightful exposure of 17 years focusing on intellectual property, patents – prosecution, contentious and licensing. She is adept in all areas of patent law, from drafting, searching and analysis to prosecution at the Indian patent office. She has also continuously supported litigation matters at the various High Courts.

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She is also specialised in conducting essentiality evaluation of patents conforming to standards for several telecommunication bodies and is acting as a LEAD EVALUATOR for IPEC.

In addition, she is proficient in advising and drafting various patent licence/technology transfer/technical know-how license agreements and contracts. Before entering the legal profession, she worked for one year and eight months in engineering, research and development of optical media, storage devices and photovoltaic products in MOSERBAER INDIA LTD.

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other words, method claims in computer programme patents may be patentable if it involves a technical advancement and provides a technical solution to a technical problem and has an improved technical effect on the underlying software.”

What is “technical”?

To identify a technical contribution and technical effect, let’s understand what “technical” means for a CRI invention. Inventions demonstrating some kind of positive effect on the resources of the device, such as reducing memory use or processing time, optimising the use of the display area or providing higher security, would be considered as being technical in nature. If the system involves some kind of communication between one or more devices, this feature would also be considered as being technical, as it would result in achieving a similar kind of positive effect on the resources of the device.

The same has been further illustrated by the Hon’ble DHC in *Ferid Allani vs UoI, W.P.(C) 7/2014 & CM APPL. 40736/2019*:

“Technical effect

It is defined for the purpose of these guidelines as solution to a technical problem, which the invention taken as a whole, tends to overcome. A few general examples of technical effect are as follows:

- Higher speed;
- Reduced hard-disk access time;
- More economical use of memory;
- More efficient data base search strategies;
- More effective data compression techniques;
- Improved use interface;
- Better control of a robotic arm; and
- Improved reception/transmission of a radio signal.

Technical advancement

It is defined for the purpose of these guidelines as contribution to the state of art in any field of technology. It is important to divide between software, which has a technical outcome, and that which doesn’t, while assessing technical advance of the invention. Technical advancement comes with technical effect, but all technical effects may or may not result in technical advancement.”

In view of the above understanding, let’s consider the eligibility framework for the three fundamental layers which are prime to the implementation of an AI invention:

- 1) Data layer;
- 2) Application layer (i.e., software); and
- 3) System layer (i.e., hardware).

The data layer is not discussed in detail, as it is mainly about collecting and processing data, and the data itself is not technical in nature. Moving on to the application layer, if the claims define purely an implementation of an application layer (e.g., mathematical subject matter), then they fall under the exclusion. For example, a claim only defining “a method of classification using machine learning” is considered abstract, i.e., non-technical, and would be excluded. Similarly, phrases such as “deep learning”, “artificial neural network” and “support vector machine” are considered to define abstract entities that would fall under the exclusion, if claimed as such.

However, if a claim defines technical means related to the system layer, it will not be considered to define excluded subject matter “as such”. To be considered eligible, the claimed subject matter should therefore demonstrate “technical contribution” and “technical effect”. Unlike in Europe, the mere reference to a physical system, for example a “method implemented on a computer” would not give the claim a sufficient technical basis to pass the eligibility test.

In a simpler example, a user might input the data of the temperature on January 1 in New York City for the past 100 years. Pre-written software might then perform a series of instructions (add all temperature values and divide them by the number of values) to determine the average temperature in New York City on January 1. More sophisticated software forecast models might consider many other data variables, such as recent weather trends, average temperatures the week before the data at issue, the temperatures in nearby locations, user-generated weather data, wind patterns, etc. But at its core, such an AI system receives data and uses pre-written software commands to analyse information and provide a desired output to the user.

More sophisticated computational models allow AI to “learn” (“The Role of Patent (In) Eligibility in promoting Artificial Intelligence Innovation”, Nikola Datzov, University of North Dakota School of Law). For example, “machine learning” allows an AI system to “sort through massive amounts of data, recognise patterns in the data, and then repeatedly adjust its search to get more precision about those patterns.” A “deep learning” model allows AI to search “data in increasing layers of abstraction without human engagement,” and AI “neural networks” rely on “mathematical modelling aimed at copying natural neural networks.” Both can create much more sophisticated systems capable of driving decisions and analysing information.

The final layer—the system layer—is the layer most people are likely familiar with. It is the layer of an AI system that runs the software, receives inputs, interacts with a user, and displays outputs. It is the user-facing layer. In the simple example above, it is the generic computer hardware that allows the system to function. It includes the processor, memory, power supply, motherboard, keyboard/mouse (or other input device), and the monitor (or other output device). In other examples, the systems layer might be the microphone that allows voice activated commands or the fingerprint scanner that unlocks a door or device. Or it may be the humanoid robot that can walk, talk, and perform various activities. Simply put, it is the tangible, physical system as part of which the AI can function.

Therefore, understanding the technical contribution made by a mathematical method implemented by AI, requires considering whether the method, in the context of the invention, serves a specific technical purpose. A generic purpose such as “controlling a technical

system” is not sufficient to confer a technical character to the mathematical method.

Moreover, the patent claim must be functionally limited to the specific technical purpose, either explicitly or implicitly. This can be achieved by establishing a sufficient link between the technical purpose and the mathematical method steps. For example: specifying how the input and the output of the sequence of mathematical steps relate to the specific technical purpose so that the mathematical method is causally linked to a technical effect.

Further, during the training process, the training algorithm (also known as the optimisation algorithm) optimises weights (trainable parameters) when trainable data sets are fed into the AI model for the machine learning process. The better the quantity, quality, and variety of the training data, the more accurate the computation of the trainable parameters will be, leading to a more precise output. In simpler terms, the quality of the AI model comprising the model architecture, training algorithm, and training data, influences the accuracy of the output. By feeding the AI model more data, the whole architecture becomes more experienced, thereby producing a better and unpredictable output.

Hence, it is important that the feature(s) of AI, which fall under the exclusions, are integrated into a practical application. The evaluation of patentability will require more additional elements in the claims that amount to an inventive concept, instead of just the recited judicial exclusions. If the overall claim amounts to significantly more than the exclusion itself (i.e., there is an inventive concept in the claim), the claim includes patent eligible subject matter.

Conclusion

To continue fostering the growth of AI-related inventions in the country it is important to define a patent eligibility framework for such inventions. The framework should provide a clear and definitive empirical determination of “technical contribution” and “technical effect” regarding the patent eligibility of AI-related inventions. The rapidly evolving nature of technology also poses a challenge, as what constitutes a technical effect or technical contribution may become outdated in future. Therefore, there is a pressing need to clarify these concepts to strike a balance between protecting the rights of inventors and promoting the public interest and social welfare.

The same was also opined by the Hon’ble DHC in *Microsoft Corp. vs Asst. Controller of Patents*, that this can be achieved by providing examples or illustrations of patentable and non-patentable computer related inventions. The need of the hour is that along with CRIs, the IPO may also consider providing eligible and non-eligible examples of AI-related inventions. There are presently no signposts for the examiners to navigate the field of examination of CRIs and AI related inventions, thus potentially leading to inconsistency in the examination of such inventions.



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Overview of two key patent cases in South Korea

Chul Kim of **FirstLaw P.C.** reports on two highly significant patent cases in South Korea, with key implications for the patent application and examination process

The Korean Supreme Court recently rendered two noteworthy decisions that underscore the Court's commitment to upholding and clarifying patent rights in South Korea.

Grace period claimable in divisional even if not claimed in parent application

Supreme Court Case No. 2020 Hu 11479 rendered on August 31, 2022

The applicant filed a patent application without claiming the benefit of a grace period based on the applicant's own prior disclosure. As a result, the patent application was rejected for lack of novelty and inventiveness due to the prior publication.

Subsequently, the applicant filed a divisional application while claiming the benefit of a grace period at the time of filing the divisional. However, the Trial Board and the Intellectual Property High Court (previously Patent Court of Korea) both decided that the grace period benefit could not be claimed for the divisional since the applicant failed to claim the grace period at the time of filing the parent application.

On appeal, the Korean Supreme Court reversed the lower court's decision and held that even if the applicant failed to claim the grace period benefit when filing the parent application, the applicant may still claim and benefit from the grace period as long as the parent application was filed within 12 months from the self-disclosure.

Facts of the case

The applicant filed a patent application titled: "Method for wiring a sequence control circuit" ("the parent application") on December 23, 2014. While it was within the grace period of 12 months from the date of the applicant's own prior disclosure, the applicant did not claim the benefit of a grace period under Article 30(1) of the Korean Patent Act (KPA) and the KIPO examiner rejected the parent application for lack of novelty and inventiveness, based on the applicant's own paper published in August 2014.

The applicant then filed a divisional application on August 30, 2016, while claiming the benefit of a grace period based on the earlier-published paper.

The KIPO examiner, however, denied the applicant's request for the grace period benefit and rejected the divisional application for lack of novelty and inventiveness, based on the prior publication. Although the applicant appealed before the Trial Board and subsequently filed a legal action for judicial review before the IP High Court, both tribunals concluded that the request for the grace period for the divisional application was improper since no such request had been made at the time of filing the parent application.

Relevant provisions of the KPA

In order to claim the benefit of the grace period, Article 30(1) of the KPA stipulates that for assessing the novelty and inventiveness of a patent application, public disclosure of an invention made by a person having a right to obtain a patent thereon shall not be regarded as prior art, provided the patent application is filed within the grace period of 12 months from the disclosure date. Article 30(2) further stipulates that an applicant seeking to invoke the grace period clause must state this when filing the patent application and submit evidentiary documents to the KIPO within 30 days of filing the patent application.

In addition, Article 30(3), enacted on January 28, 2015 and applicable for patent applications filed on or after July 29, 2015, introduced a way for the claiming of the benefit of a grace period even after the filing date of a patent application under certain conditions. Specifically, Article 30(3) stipulates that, subject to a fee, a document stating the intent to invoke the grace period clause and evidentiary materials in support thereof may be submitted within one of the following periods:

- i) During the period of filing a voluntary amendment or submitting a response to an office action; or
- ii) Within three months of receiving a certified copy of either a notice of allowance or the Trial Board's decision reversing the examiner's rejection of the patent application.

SOUTH KOREA



However, Article 52(2) of the KPA stipulates that, although a divisional application shall be deemed to have been filed when the parent application was filed, the effect of this statutory presumption of retroactive filing shall not be given for the purpose of applying Article 30(2), mentioned above.

Intellectual Property High Court decision

The Intellectual Property High Court decided that a divisional application is not eligible for a grace period if the request for the grace period was not made at the time of filing its parent application, because:

- i) If such claiming in a divisional application is allowed, Article 30(2) of the KPA would be easily circumvented or become meaningless; and
- ii) Article 30(3), which provides an opportunity to belatedly claim the benefit of a grace period, may be invoked for a patent application filed on or after July 29, 2015, and is not applicable to the subject parent application, which had been filed prior to the enactment of Article 30(3).

Supreme Court decision

On appeal, the Supreme Court overturned the lower court decision. It ruled that even though the grace period had not been claimed when filing the parent application, in view of the rationale underlying the provisions of a grace period and a divisional application, it is proper to confer the divisional application the benefit of a grace period, provided that the claim for the grace period benefit is timely made when filing the divisional application.

Aftermath of the decision

In accordance with the Supreme Court's decision, the KIPO revised its examination guidelines on March 22, 2023 to recognise the applicant's ability to claim a grace period when filing a divisional application, where the parent application was filed within the period of 12 months from the applicant's prior disclosure.

Scope of a product claim is not confined to the method exemplified in the patent specification

Supreme Court Case No. 2019 Hu 11541 rendered on January 14, 2022

In a case dated January 14, 2022, the Supreme Court reversed the Intellectual Property High Court's decision, holding that the scope of protection of a product patent claim is not confined to what may be produced by the method of manufacture specifically disclosed in the patent specification.



Chul Kim

Chul Kim is a patent attorney and partner at FirstLaw P.C. He received his bachelor's degree in electrical engineering from Seoul National University and later obtained his LL.M. degree from University of Southern California, Gould School of Law.

His areas of technical expertise cover various aspects of electrical engineering, including semiconductors, wireless communication, computer software, and artificial intelligence. He has been actively involved in numerous significant prosecution cases, patent infringement actions, invalidation trials, and scope confirmation trials on behalf of multinational and domestic companies.

Facts of the case

The patentee brought a scope confirmation petition before the Trial Board, seeking to obtain a ruling that the product made and sold by the respondent fell within the scope of claim 1 of Korean Patent No. 0815579.

Claim 1 of the patent is directed to a three-dimensional multilayer fabric comprising a surface layer, a backing layer and an intermediate layer that connects the surface layer and the backing layer. The claim has the limitation that intermediate warp threads are woven without interlacing with weft threads.

The description and drawings purporting to define the respondent's product, submitted for review by the patentee, presented a specific configuration of a product produced by the respondent, which corresponded to the elements of claim 1.

Trial Board decision

The Trial Board sided with the patentee and concluded that the respondent's product described and presented by the petitioner for review fell within the scope of claim 1 of the patent since it included all of the elements recited in claim 1.

Intellectual Property High Court decision

On appeal, however, the respondent argued that the manufacturing method actually employed by the respondent differed from the process described and presented by the petitioner.

Considering the respondent's argument, the Intellectual Property High Court overturned the Trial Board's ruling. This was based on the reasoning that, as a matter of principle, what is described in the scope confirmation petition, as presented by the patentee-petitioner, should be considered as the proper subject matter for comparative review and scope confirmation. However, if the manufacturing process asserted to be functional by the respondent, in fact, is not identical to the method described in the petition or given in the patent specification, the scope confirmation petition has no merit and should be dismissed.

Supreme Court decision

In reversing the decision of the IP High Court, the Supreme Court determined that the subject matter of claim 1 should be construed as a three-dimensional multilayer fabric as a product per se. Therefore, the scope of claim 1 should not be limited to what may be made by the specific manufacturing method exemplified in the patent specification or described in the petition.

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