Tamil Nadu

TDPC

Tamil Nadu Technology Development & Promotion Centre

A Joint initiative of

Confederation of Indian Industry

Newsletter
May 2021

PRESENTING

Tamil Nadu Technology Development & Promotion Centre (TNTDPC)

SECTORS

SERVICES

Tamil Nadu Technology Development & Promotion Centre (TNTDPC)

Vision

Connect Emerging Technologies with MSMEs to promote research, innovation and economic growth and reach the global markets.

Mission

- To create and facilitate knowledge sharing and learning opportunities on emerging technologies.
- To facilitate the protection of Intellectual Property Rights.
- To facilitate networking opportunities to share, learn and grow.
- To be the connect between Industry and Academia in enhancing research & innovation.
- To provide regular inputs to the Government on sustaining the conducive ecosystem for the growth of MSMEs.

Objectives

- **Bridge the Technology Gaps:** To identify technology gaps in key industries in Tamil Nadu and to facilitate the Capacity Building, Networking, Problem Solving, Technology Transfer, IPR and Consultancy.
- **Prepare for Future:** To lay the basis for future and high technology through global partnerships and to disseminate the knowledge for the promotion of industries.
- **Develop Talent:** To enable technology promotion and development through emphasize and nurturing entrepreneurship, talent development through education, training, and support.

May 2021 – A ROUND UP

Eighth Meeting: 3rd Edition CTO Forum Roundtable Series, 07 May 2021

The Eighth Meeting of 3rd Edition CTO Forum – Roundtable Series for the year 2020-2021 on 07 May 2021. The CTO Forum is a platform for the Chief Technology Officers to discuss, collaborate, collate the emerging and existing technologies & enhance professional excellence.

The meeting had an interactive conversation on the **Data Privacy, Residency and Governance and what / how it should be addressed in new products and processes**. This meeting was moderated by **Mr Koushik Ramani**, Managing Partner, NetworkGain and this discussion included the experts talk by **Mr Sumit Monga,** Head Government Affairs, Unlimit - A Reliance Group Company & **Mr Murali Sundaram,** Technical Consultant, Npedia Technologies Pvt Ltd. The forum was attended by 15 members including CTO's and senior technologists from various sectors and industries.

Industry Best Practices Sharing Session on Advanced Technologies in Water Management: 21st May 2021

The Technology Division of CII organized the Industry Best Practices Sharing Session on Advanced Technologies in Water Management on 21st May 2021 from 1000-1400 hrs. The objective of this session is to provide an opportunity to industry members to listen to latest technological innovations in the water management by fellow industries and create a culture to improve the water management.

Increasing industrial production especially in water intensive industries is already putting pressure on the limited freshwater resources in India and worldwide. Therefore, it is very critical that industries use water judiciously and reduce its water footprint as much as possible in order to be sustainable in future. Water treatment technologies are evolving to meet the changing demands of this new century. Innovation and technology have a

vital role to play in scarcity and safety, water efficiency, utility operations, monitoring and treatment and data and analytics. Understanding the relevance of the subject, the session is made in such a way that participants get learned/refreshed on the most significant technology trends that have evolved in response to such water stresses and constraints. The session is being enriched with the case study demonstration of leading practitioners of water management from a discrete and a process based companies.

The key eminent speakers addressed at session include **Mr S Varadarajan**, Chairman-Session on Advanced Technologies in Water Management & Director and Chief Growth Officer,VA Tech Wabag Ltd; **Mr Amir Basha,** Chief Technology Officer, VA Tech Wabag Ltd; **Mr Ajay Popat**, President, Ion Exchange (India) Ltd; **Mr AR Unnikrishnan**, Managing Director, Saint-Gobain India Private Limited - Glass Business; **Mr N Ramadoss**, Founder, Quality Business Systems; **Mr C Sripati,** Expert Engineer, International Centre for Clean Water (ICCW),IITM Research Park, Chennai

The focused sessions aim to provide knowledge to the participants on

- Specific water consumption & benchmarking wherever applicable
- Advanced water & wastewater treatment technologies for industrial application
- Effluent recycling and reuse practices - Industry specific case studies including sludge management
- Zero liquid discharge technologies for polluting industries & ones facing water shortages
- Industry specific case studies on water conservation & opportunities identified for water savings through water audits
- Cost benefit analysis to enable industry understanding and decision making

Industry Best Practices Sharing Session on Hybrid Work - Model Challenges, Opportunities, Technologies & Strategies for HR Managers: 28 May 2021

The Technology Division of CII organized the Industry Best Practices Sharing Session on Hybrid Work-Model Challenges, Opportunities, Technologies & Strategies for HR Managers on 28th May 2021 .

Covid 2019 and Year 2020 has created a new normal bringing in revolutionary changes in the industry. The same continues even in 2021. Working from home and having a small team in office is becoming a norm. This has been a true test of leadership that

forced a sudden shift in how employees work, customers behave, supply chains functions and business operate. It has been found that gradually people could adapt to the new ways of working. The increased use of technology has been very useful in making people realise the benefits and to optimise cost. '*So far, so good' but there is more to it* "***Every truth has two sides; it is as well to look at both – before we commit ourselves to" - AESOP.***

Presently HR is in such a situation. Work from Home has been an effective working model. However, engaging with the employee and team collaboration becomes difficult. The challenges faced by organisations are retaining the talent, providing continuous skills upgradation to its employees, create flexible and convenient work-models and importantly create trust in the people. We have seen Organizations becoming more flexible and accepting that workplace of future would be a hybrid model. The nature and form of hybrid model would be different for each organization. There are no time-tested models. We are learning from each-others experiences and thought process. Would adopting Deliberate Emerging Strategies help in reshaping HR as per the opportunities and threats of the business environment? How can HR gear up for a thoughtful, and organized action and be prepared for unplanned actions and initiatives that maybe required for Business?

Best Practices discussed in this session include: Strategies of Hybrid work model – making it the people's choice – Creating the Mindset / Leveraging Digital Transformation in HR – Skilling & Re-Skilling of HR Managers & the Employees / Building a culture of Digitization, Digitalization & Digital Transformation / Enabling Hybrid Work Models in Organisations / Future of Hybrid Work Models

The key eminent speakers addressed at session include **Dr Richa Pande**, Senior Vice President – HR, Inatech India Pvt Ltd; **Mr Rajesh P**, Vice President & Head Human Resources, CavinKare Private Limited; **Mr Anil Karthikeyan**, Vice President, Human Resources, Integra Software Services; **Ms Usha Subramaniam**, Head - Group Talent and People Development, Organisational Development, HR, Grundfos Limited; **Ms Shreya V**, Team Member - HR (Manufacturing, L&D, New Projects) ,Saint-Gobain India Private Limited - Glass Business; **Mr Aron Minalkar,** AGM HR, TAFE Limited

Session Outcome: The Hybrid Work Model

The session was designed to provide an understanding of how some Organizations have started thinking of the Hybrid Work Model as the future of work to address -

- Demand for time, with increased freedom, flexibility to employees.
- Emerging multiple ways of managing Business.
- Using Technology to Collaborate with Digital Colleagues and Talents.

Technology Session Series - Refrigeration Technologies: 28 May 2021

Tamil Nadu Technology Development & Promotion Centre of CII in partnership with Alfa Laval India organizing the Technology Session Series to share the knowledge and creating networking platform to discuss about the latest trends and technologies across sectors. In this context, CII - Alfa Laval organized the Session on Refrigeration Technologies on 28 May 2021 at CISCO WebEx.

The session discussed about how the sustainable heating and cooling applications are experiencing a rapid transformation to meet the changes impacting the refrigeration operation and a positive impact on the environment. The subject matter experts from Alfa Laval discussed about the latest trends in Industrial Refrigeration and how Alfa Laval solutions shaping the industries. The experts talks focused with unique solutions, case studies and knowledge on today's issues faced by industries. The panelists discussed about the decades of combined experience with natural refrigerant solutions and the participants had an interactive session about the latest innovations enabling more sustainable heating and cooling solutions with case studies and success stories. Around 150 professionals from Refrigeration industries, Engineering, Food Processing, Pharma, Chemical, Fish, Chicken & Meat processing, Dairy, Breweries and others attended the session.

Roundtable session on Accelerating ADAS & Autonomous Driving Systems Development: 28 May 2021

The Tamil Nadu Technology Development & Promotion Centre of CII in association with Ansys organizing the roundtable session on Accelerating ADAS & Autonomous Driving Systems Development

This round table discussion deliberated on the key pillars of ADAS/AD development include safe system design, sensor optimization, software, and system validation. Some of the challenges faced by engineering teams today include sensor integration, achieve test coverage, meet standard compliances, mitigate EMI & optical artifacts & so on and how simulation plays a critical role in addressing these challenges. With simulation, millions of miles, thousands of driving scenarios, and design parameters can be virtually tested with reducing development & testing efforts (~30%) while ensuring safety, reliability & certifiability.

The sessions of this roundtable discussion was structured in a manner to enable the participants to gain valuable insights through a Panel Discussion on Challenges in ADAS/AD Systems Development & Validation – Maximizing Performance, Safety & Reliability, and Time & Cost Objectives this session was moderated by **Mr Deepangshu Dev Sarmah**, Editor, Mobility Outlook, **Dr Manaswini Rath**, VP & Global Head, Autonomous Driving, KPIT, **Dr Garv Modwel**, Deputy Director(Software), Valeo India, **Dr Naveen Gautam**, Managing Director, Hella India Automotive Pvt. Ltd, **Mr Binoy Paul**, Associate Chief Engineer, Mahindra and Mahindra Limited and **Mr Raghavendra Bhat**, Technical Manager for India, South East Asia for SBU, Ansys,

And followed by a presentation on How simulation accelerates the validation of ADAS and safe Autonomous vehicle by **Mr Gilles Gallee**, Tech Evangelist, Autonomous Vehicle, Ansys and concluded with a fireside chat by **Mr Nicolas Orand**, Senior R&D Director, Autonomous Product Line, Ansys along with **Ms Bindu Santha Philip**, General Manager- Automated driving functions, Robert Bosch Engineering and Business Solutions Private Limited and **Mr Srinath Murthy**, Head of System Engineering, ADAS (Systems) business unit, Continental Automotive Components (India) Private Limited.

This session was well attended by more than 250 delegates from OEM, MSMEs, Startups and relevant industry personals PAN India.

Intellectual Property Rights (IPR) Services

8th Meeting: IP Practitioners Forum: 28 May 2021

Tamil Nadu Technology Development and Promotion Centre (TNTDPC) of Confederation of Indian Industry (CII) organized the eighth Meeting of IP Practitioners Forum for the year 2020-2021 on 28th May 2021. IP Practitioners Forum is a platform to create an ecosystem for Senior IP Professionals to converge over common interests. The IP Leaders discuss and collate the emerging and existing legal and technological landscape and enhance professional excellence. The meeting had an interactive "Panel Discussion on the topic: Software Patents". Around 100 participants such as IP Professionals, IP Managers, Attorneys, Patent Professionals, Entrepreneurs, Start-ups, Inventors, Researchers, Academia attended this panel discussion.

June 2021 – THE CALENDAR

Name of the activity	Date
Technology Session Series	June 2021
Specialized Training on Patent Search & Analytics, Patent Drafting & Patent Prosecution	21 - 25 June 2021
Vocational Education and Training: Skilling with a Purpose - Decade 21	25 June 2021
Nineth Meeting: IP Practitioners Forum	30 June 2021

Flagship Event 2021 – 2022 Calendar

Tamil Nadu TDPC

Confederation of Indian Industry

TAMIL NADU TECHNOLOGY DEVELOPMENT & PROMOTION CENTRE

EVENTS CALENDAR JUNE 2021 - MARCH 2022

CII EMERGING TECHNOLOGIES

Conference on
Emerging Technologies
30 July 2021

Conference on
Food Flavors & Ingredients

Conference on
Food Flavors & Ingredients
July 2021

CII AutomotiveElectronics

7th Edition
Conference on
Automotive Electronics
August 2021

Education Summit 2021

2nd Edition
Educational Summit
September 2021

Conference on
Refrigeration Technologies

Conference on
Refrigeration Technologies
October 2021

7th Edition
Conference on
Automotive Design & Engineering
October 2021

6th Edition
Conference on
Aerospace & Defence Manufacturing Technologies
November 2021

14th Edition
Conference on
Automotive R&D Trends
March 2022

For more details, speaking opportunity & sponsorship

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INDUSTRY VOICE

Pharmaceutical Industry and Intellectual Property Rights – An Indian Perspective

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Introduction

The Indian pharmaceutical industry has witnessed tremendous growth in the past decades, in terms of market capturing and contribution to the Gross Domestic Product of our country. India's domestic pharmaceutical market is estimated at USD 41 billion in 2021 and is likely to reach USD 65 billion by 2024 and further expand to USD 120-130 billion by 2030.[1] Considering the promising future of the pharmaceutical industry, the Government of India is diligently involved in promoting this industry, by introducing and enforcing regulations, which are at par with the global standards. Due to the expansion of the market and the investment by the industry players, intellectual property rights protection becomes imperative for the companies.

In this article, we are discussing the scope and ambit of the protection of pharmaceutical trademarks and patents under Indian laws.

Trademark Law and the Pharmaceutical Industry

Trademark registration significantly protects drugs of various pharmaceutical companies and helps giving it tremendous value in maintaining a brand name for the drug in the market. The pharmaceutical industry particularly accounts for majority of the trademark registrations as compared to any other sector in India.

[1]Indian Brand Equity Foundation. Pharma Industry in India: Pharma Sector Overview, Market Size, Analysis. Available at: <https://www.ibef.org/industry/pharmaceutical-india.aspx> [Accessed 2 June 2021].

- **Protection of drugs as a Trademark**

The protection of pharmaceutical trademarks is comparatively challenging than other trademarks. Section 9(a) of the Trademark Act, 1999, prohibits the registration of trademarks which are descriptive, or which are devoid of any distinctiveness, i.e., not capable of distinguishing the goods or services of one source to another and it is of such nature as to deceive the public or cause confusion. However, when the trademark has acquired a secondary meaning or has gained distinctive character owing to its prolonged usage and recognition amongst the consumers.

Specifically, in the case of pharmaceutical trademarks, the brand name or drug name is generally derived based on the treatment performed by the drug, salt composition of the drug, or any other related medical term, because of which it does not have an inherent distinctive character; however 'distinctiveness' is a requisite, for a mark to qualify as a trademark.

Further, as per Section 11 of the Trade Marks Act, 1999, a trademark must not be similar to an earlier trademark, which is likely to confuse customers. During procurement of pharmaceutical products or drugs, the customers should be able to easily differentiate between the products according to the brand name or drug name and trade dress, to avoid or reduce errors. Hence, the process of protection of the brand name or drug name becomes challenging and evidence with regards to the secondary meaning or gained distinctive character is the factor to decide on distinctiveness.

Another significant provision in this regard is laid down in Section 13 of the Trade Marks Act, 1999, which states that a trademark must not be any name of chemical elements, compounds, and International Non-proprietary Names (INNs) which have been declared by the World Health Organisation and notified by the Registrar of Trademarks in 2012, or which are deceptively similar to the INNs. As the listed INNs are generic names of active pharmaceutical ingredients, no pharmaceutical company can have monopoly rights over it, and hence can be used by all.

Therefore, in order to avoid trademark opposition or objection against the protection of the brand name or drug name, the trademark should be devoid of:

- **Generic words or terms** – Common everyday names such as “pharma” or “anti” should be avoided for pharmaceutical products. These marks are unlikely to be granted protection, as they only indicate the ingredient and not the source of the products; therefore is likely to deceive the consumers.
- **Descriptive words or terms** – Words or terms that directly describe the features or quality of the pharmaceutical products or provide the information related to the same, e.g. REMOVEPAIN for a muscle relaxant.
- **Suggestive words or terms –** Words or terms that suggest qualities or characteristics of the pharmaceutical products and the services without actually describing them, e.g. GRROW for health supplement for kids.

- **Non-Conventional Trademark Protection**

  In the present times, pharmaceutical companies have initiated the development of advanced and innovative ways to help distinguish the drugs from the other competitors in the market. Therefore, pharmaceutical companies are relying on non-traditional ways for trademark protection of the drugs in addition to just the brand name or drug name for their products. This helps to avoid deception and confusion amongst the consumers and also highlights the distinctiveness of the trademark.

  The non-traditional marks or the non-conventional marks, specifically in the pharmaceutical industry include the shape of drugs, colour combinations of drugs, and trade dress.

Interestingly, sound marks have been registered by pharmaceutical companies in India, such as the sound mark “HI-SA-MI-TSU” by Hisamitsu Pharmaceutical Co. Inc. of Japan. “The Purple Pill” of AstraZeneca’s Nexium and the “Red and White” Dyazide of SK&F’s, have been registered as colour trademarks, thus helping the companies to create their distinctive brand image.

The Supreme Court of India, in the case of *Cadila Health Care Ltd v. Cadila Pharmaceuticals Ltd.*[2] laid down certain factors for determining deceptive similarity between pharmaceutical trademarks, which include:

[2] 2001 (5) SCC 73

- The nature of the marks i.e. whether the marks are word marks, label marks or composite marks;
- The degree of resemblances between the marks, i.e. similarity of idea or sound;
- The nature of products;
- The class of purchasers, their education and intelligence and the degree of care they are likely to exercise in purchasing and/or using the goods;
- The mode of buying the products or placing orders for the products; and
- Any other surrounding circumstances which can be relevant in the extent of dissimilarity between the competing marks.

The European Court of Justice has also offered clarifications on the nature of confusion in case of pharmaceutical trademarks, that, when read with Section 11(1) of the Trade Marks Act, 1999, classifies the likelihood of being deceived into different categories like direct confusion of public, indirect confusion or an association where the public makes a connection and strict association where the similarity of the trademarks brings to mind the memorable mark even though the two are not necessarily confused.

Furthermore, the European Court of Justice has also provided elements in the case of *SABEL BV vs Puma AG, Rudolf Dassler Sport*[3]*,* wherein the basis for evaluation of the risk of confusion is dependent on whether the infringed and the infringer's drug treats the same disease, as the consumer base is different if the ailment is different, the amount of time consumed in ensuring correct administration of the drug by end-users and pharmacists, whether it is an over-the-counter or a prescription based medication, who is the actual consumer and the extent to which the doubtful impression is offset by knowledge and skill in the field.

The aforesaid criteria when read with Smith Hayden & Co. Ltd.'s Application[4] and *Amritdhara Pharmacy vs Satya Dev Gupta*[5] AIR 1963 SC 449, together lays down criteria for testing confusion, stating that in case a substantial number of the existing trademark's customers are not confused or deceived, the average intelligence and imperfect recollection of the layman and that deceptive resemblance can only be established by answering which trademark is likely to deceive the consumers.

[3] C-251/95
[4] (1946) 63 RPC 97, p.101
[5] AIR 1963 SC 449

Patent Law and the Pharmaceutical Industry

The pharmaceutical sector has always been knowledge-intensive and demands considerable investments. The developing period of pharmaceutical products to reach a favourable outcome is considerably longer as compared to other sectors or industries. Therefore, it becomes imperative for pharmaceutical companies to obtain the protection of their inventions through acquiring patent rights. Patent, inter alia, encourages innovations by inventors as it protects the investments made for research and development as creates an incentive for innovation. However, the patentability of pharmaceutical inventions, particularly in India, has always been in intense debate due to statutory challenges. Apart from the worldwide patentability requirements i.e., novelty, inventive step, and industrial applicability, the pharmaceutical and related inventions must qualify the litmus test laid down under Section 3 of the Patents Act, 1970, particularly Sections 3 (d), (e), and (i).

Protection of Pharmaceutical Patents

Section 3 of the Patents Act, 1970, specifies the inventions which are not patentable subject matter, even if such inventions qualify the patentability criteria.

Section 3(d) of the Patents Act, 1970, deserves special attention in the context of the pharmaceutical inventions and which states -

"the mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant.

Explanation - For the purposes of this clause, salts, esters, ethers, polymorphs, metabolites, pure form, particle size, isomers, mixtures of isomers, complexes, combinations and other derivatives of known substance shall be considered to be the same substance, unless they differ significantly in properties with regard to efficacy".

It is important to note that the main purpose of 3(d) of the Patents Act, 1970, is to prohibit the ever-greening of pharmaceutical patents and bring the inventions, particularly related to drug or chemical compounds, under the scope of patenting. This section stipulates that an invention, already claiming the new form of a known substance, or second and subsequent use of a known substance, having established medicinal activity, shall be deemed to be treated as the same substance and shall not be considered as patentable, unless the invention in question significantly demonstrates the improved therapeutic efficacy with respect to that known compound.

The Hon'ble Supreme Court of India, while adjudicating the *Novartis AG Vs. Union of India (UOI) and Ors* [6] emphasized that true legislative intent of the Section 3(d) of the Patents Act, 1970 and stated that "*Section 3 (d) is meant especially to deal with chemical substances, and more particularly pharmaceutical products. The amended portion of section 3(d) clearly sets up a second tier of qualifying standards for chemical substances or pharmaceutical products in order to leave the door open for true and genuine inventions but, at the same time, to check any attempt at repetitive patenting or extension of the patent term on spurious grounds*". Also, while interpreting the term "efficacy" the Court opined that in the context of pharmaceutical patenting, "efficacy" means the ability to produce a desired or intended result. Therefore, the mere change in the form of the already known form, having inherent properties of that form, does not constitute "enhanced therapeutic efficacy". Such a new form is required to expressly exhibit the therapeutic efficacy, else excluded from patentability.

It is important to mention herein that the Indian Patent Office, while examining the applications, provides an opportunity to furnish the additional documents or experimental studies, to substantiate the "therapeutic efficacy" in the invention, which was not disclosed in specifications at the time of filing the application.

Section 3(e) of the Patents Act, 1970, is pertaining to patenting of combination inventions, in the field of chemical as well as biotechnological sciences and states –

[6] MANU/SC/0281/2013

"a substance obtained by a mere admixture resulting only in the aggregation of the properties of the components thereof or a process for producing such substance" is not patentable"

It is a well-accepted principle of the Indian Patent Laws, that mere collocation of more than one component, not involving the exercise of any inventive faculty and performs its function independently, is not patentable. In case the working interrelations brought about by the collocation of these components is linked to produce new or improved results, then the subject matter is considered to be patentable.

The claims relating to pharmaceutical compositions are mostly objected by the Indian Patent Office under Section 3(e) of the Patents Act, 1970, as it relates to a known composition or mere admixture of known components which does not involve any synergistic effects. One of the most significant reasons behind objections against such patent applications is the ambiguity in understanding terms such as "mere admixture" and "aggregation of the properties" of Section 3(e) of the Patents Act, 1970.

The Hon'ble Bombay High Court in *Lallubhai Chakubhai Jarivala v. Shamaldas Sankalchand Shah*[7] interpreted the term "mere admixture" stating that, a "mere admixture" is when a person merely admixes the known substances with an expectation to get an additive effect of both the substances. However, when a person gets more than the expected additive effect, then the admixture is considered as a synergistic composition. When a substance is not known at all and its properties are also not known, then it is not possible to prepare an admixture of such an unknown substance. Hence, the chemical compositions of the new substance or compound cannot be considered as a "mere admixture", as neither the compounds of such composition were disclosed in the prior arts, nor any properties were known.

In regards to "aggregation of the properties", the case of *Ram Pratap v. Bhaba Atomic Research Centre*[8]*,* clarifies that, a mere juxtaposition of features, which are already known before the priority date, that has been arbitrarily chosen from among a number of different combinations, is not a patentable invention and amounts to aggregation of properties.

[7] (1934) 36 BOMLR 881
[8] (1976) IPLR 28 at 35

Section 3(i) of the Patents Act, 1970, states – *"any process for the medicinal, surgical, curative, prophylactic, diagnostic, therapeutic or other treatment of human beings or any process for a similar treatment of animals to render them free of disease or to increase their economic value or that of their products"* is not a patentable invention.

In the field of pharmaceuticals, it is noticed that method of treatments is often claimed in the guise of composition claims. However, it is important to note that any claim related to the treatment, is not the patentable subject matter in India. Though, a patent may be obtained for surgical, therapeutic or diagnostic instruments or apparatus.

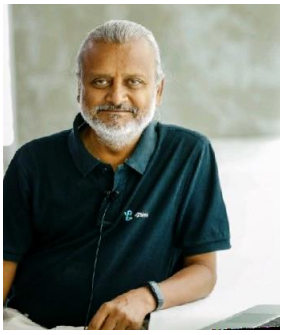
Conclusion

India has always been in discussion with respect to its IP regime and procedures. However, the IP Office periodically provides with manuals[9] and necessary guidelines in order to achieve the uniformity in grant procedures.

The Indian Courts also provide clarifications for ensuring the protection of intellectual property rights, in order to promote protection in every industry, including the pharmaceutical industry.

[9] https://ipindia.gov.in/resources.htm

MEET THE EXPERT – AI TRENDS



Murali Sundaram
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Npedia Technologies Pvt Ltd

1. Data Labeling and Annotation Services

What is it: Data annotation and labeling services support enterprises in labeling/annotating data for artificial intelligence (AI) projects. These services and associated platforms route and allocate this work to both internal staff and external third-party knowledge workers.

Recommendation: Adopt

How fast is this moving: The proto provider in this space was Amazon Mechanical Turk (MTurk) launched in 2005 designed to coordinate labor to perform micro-jobs that computers were unable to perform. As AI adoption has picked up among enterprises, the need for labeled data has dramatically increased in order to remove the bottleneck in developing AI solutions. As a result, offerings in this space have grown to help companies turn their unstructured data into structured data. Baseline offerings in this space are access to pools of prequalified knowledge workers who can label and annotate training data such as street scenes, speech, music, photos, documents and other assets. Many providers are now beginning to adopt a combination of machine learning techniques and human workers to accelerate the classification and annotation of training data. Increasingly these solutions are enlarging from preproduction focus to real-time human-in-the-loop solutions designed in real time to call upon a pool of workers (internal and external) to handle automation exceptions where model confidence is low, e.g., classifying and answering customer support questions. Further, annotations, classifications and content provided by third-party knowledge workers can be synchronized back to enterprise platforms such as content management systems, CRM, conversational platforms and knowledge management systems. Challenges remain around the skills that third party knowledge workers have to annotate the data but are

ameliorated somewhat by the development of reputation systems and pre-qualification tests. While tech heavyweights like Facebook, Amazon, Google and Microsoft have used these providers for a while, many end users are quite unaware that such services exist.

Does this affect Business: While the supervised learning approach is predominant in AI, these services will continue to grow in usage. Scenarios that do not require deep domain knowledge of a field or datatype can expand annotation more quickly by using external knowledge workers. While there are many applications for this capability in preproduction environments, the real-time human in the loop solutions where models are continually trained and calibrated, such as chatbots or recommendation engines, will provide ongoing benefit. Business users need to join the human-in-the-loop workflows to route and train handover and moderation tasks to subject matter experts.

What do I need to do?:· Ensure the provider you choose has methods to test their pool of knowledge workers for domain expertise and measures around accuracy. · Carefully estimate the amount of labeled data that will be necessary when investigating deep learning models. · Allow data scientists to focus their time on more valuable tasks and lighten their load in classifying and annotating data by using these services. · Use providers with real-time human-in-the-loop solutions for production systems like chatbots and recommenders to handle low confidence thresholds, spikes in demand or access to real-time knowledge not present in the enterprise. · Design development and production workflows to leverage a mixture of knowledge workers — both internal and external staff.

Type of benefit: Moderate

Type of technology: Early mainstream

Sample Vendors: Alegion, Amazon SageMaker Ground Truth, Apache Hive, CloudFactory, Directly, Figure Eight, Globalme, Labelbox, Mapillary, Prolific

2. Decision Intelligence

What is it: Decision intelligence (DI) is a practical domain framing a wide range of decision-making techniques. DI provides a framework that brings multiple traditional and advanced disciplines together to design, model, align, execute, monitor and tune decision models and processes. Those disciplines include decision management (including advanced nondeterministic techniques such as agent-based systems), decision support,

continuous intelligence and process management; and techniques such as descriptive, diagnostics and predictive analytics.

Recommendation: Pilot

How fast is this moving: In a dynamic and increasingly complex business environment where business processes are siloed and disjointed, preventing the proper harmonization of collective decision outcomes, decisions are often ineffective. Five key reasons contribute to this: · The pace of business is increasing · Unstructured, ad hoc decisions are becoming more frequent · Collaboration between man and machines is expanding · Tighter regulations are making risk management more prevalent · Consistency of decisions across the organization is questionable The current hype around automated decision making and augmented intelligence fueled by the integration of artificial intelligence (AI) techniques in decision making, is pushing DI toward the Peak of Inflated Expectations. An emerging market around various software disciplines is starting to provide sensible answers for decision makers, but it will take between five to 10 years for DI to reach the Plateau of Productivity.

Does this affect Business: The harmonization of decision-making disciplines through practically implementing Industry Analysts decision intelligence model is applicable to a wide range of decisions within any industry or organization. Decision intelligence helps organizations: · Reduce the unpredictability of the outcomes of today's decision models that stems from the inability to properly capture and account for the uncertainty factors linked to their "behavior" in the business context. · Improve the impact of business processes by materially enhancing the sustainability of organizations' decision models which is based on the power of their relevance, the quality of their transparency and the strength of their resilience. · Increasing the scrutiny of autonomous decision models (from embedded analytical assets to self-contained machine agents) at design time, so that their collective impact can be better understood, and disastrous outcomes can be avoided.

What do I need to do?: Many of the disciplines encompassed within the DI domain are already leveraged by a large number of enterprises, unfortunately inconsistently across (and even sometimes within) processes, resulting in inconsistent decisions and sometimes contradictory outcomes. Data and analytics leaders should: · Improve the outcome of decision models and accommodate uncertainty factors by evaluating the

contributing decision-modeling techniques. · Promote the sustainability of cross-organizational decisions by building models using principles aimed at enhancing their traceability, replicability, pertinence and trustworthiness. · Improve the predictability and alignment of cooperating decision agents, by mapping and simulating their collective behavior while also estimating their global contribution versus their local optimization. · Develop staff expertise in the full range of traditional and emerging decision-augmentation and decision-automation techniques, including descriptive (such as dashboards and reports), diagnostic (such as interactive data exploration tools), predictive (such as machine learning) and prescriptive analytics (such as optimization, business rule processing and simulation with rules). · Tailor the choice of decision-making technique to the particular requirements of each decision situation by collaborating with business unit managers, subject matter experts and business process analysts.

Type of benefit: High

Type of technology: Emerging

Sample Vendors: ACTICO, Exponential Machines, Noodle.ai, PROWLER.io, r4 Technologies, R4, ReactiveCore

3. Deep Neural Network ASICs

What is it: A deep neural network (DNN) application-specific integrated circuit (ASIC) is a purpose-specific processor that accelerates DNN computations.

Recommendation: Adopt

How fast is this moving: DNNs are statistical models that detect and classify patterns in input data such as sound and images, or text patterns such as sentences. There are two phases in DNN systems: training and inferencing. In the training phase, the DNN iterates across a large dataset and distills it down to a small DNN parameter set. In the inferencing phase, the DNN uses this parameter set to classify an input such as an image, speech or text. A majority of training and inferencing tasks use GPUs. DNN ASICs can deliver significantly higher performance and lower power consumption than CPUs or GPUs when accelerating neural networks. Google has deployed DNN ASICs (known as tensor processing units [TPU, TPU2, TPU3]), at scale, providing inferencing across its businesses, for example, with speech and image recognition. The Google Cloud TPUs

also accelerate the training process, a task formerly delegated to GPUs. Other cloud vendors are following suit. Other dedicated silicon is coming. Graphcore has developed a custom processor to deliver extreme performance for DNN-based applications and has launched a PCIe-based C2 card comprising two "Colossus" IPU processor chips. Intel is also developing an ASIC code named "Spring Crest," optimized for DNN training and NNP. Amazon also announced its inferencing-focused chip called Inferentia. Other major initiatives in DNN ASICs include Huawei Ascend series of chips and Qualcomm's Cloud AI 100 chip — both are targeted to accelerate DNN workflows.

Does this affect Business: Hardware acceleration will enable neural-network-based systems to address more opportunities in a business through improved cost and performance. Use cases that can benefit from DNNs include speech-to-text, image recognition and natural-language processing. IT leaders deploying deep neural network applications should include DNN ASICs in the planning portfolio. We expect this market to mature quickly, possibly within the three-year depreciation horizon of new systems.

What do I need to do?: The benefits of DNN ASICs in performance and energy consumption are significant. However, widespread use of DNN ASICs will require the standardization of neural network architectures and support across diverse DNN frameworks. Lack of maturity of some DNN ASICs can severely limit utilization. Plan an effective long-term DNN strategy comprising DNN ASICs by choosing ASICs that offer or support the broadest set of DNN frameworks to deliver business value faster. Select a DNN ASIC if your business will perform better with a dedicated NNP while supporting the widest range of frameworks required by your organization.

Type of benefit: High

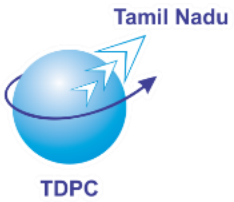
Type of technology: Adolescent

Sample Vendors: Amazon, Google, Graphcore, Intel, SambaNova Systems, Wave Computing

TAMIL NADU TECHNOLOGY DEVELOPMENT & PROMOTION CENTRE

Tamil Nadu Technology Development & Promotion Centre (TNTDPC) is a joint initiative of the Government of Tamil Nadu and Confederation of Indian Industry (CII). TNTDPC is incorporated as a Society. It is governed by an apex Governing Council chaired by the Secretary, Technology Development Board, Department of Science & Technology, Government of India, and consisting of members from Government of India, Government of Tamil Nadu, Industries and CII.

TNTDPC is a unique model in the country conceived as a one stop shop for Technology Identification, Promotion, Technology Upgradation for industries in Tamil Nadu. The major task of the centre is focused towards providing a helping hand to the Micro, Small & Medium businesses and entrepreneurs in Tamil Nadu to reach and to compete in the market place through technology innovation and meeting international standards. As the Indian economy progresses, the role of MSMEs changes and they are facing new challenges. International competition requires enhanced competitiveness in all quarters. The Centre provides a user-friendly environment, linking support and guidance from experts in upgrading the industrial growth of the State. The Centre uses networks of R&D institutions, industries and CII Members in order to create and facilitate the Capacity Building, Networking platforms, Technology Transfer, Advisory services and undertake projects on need basis.



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