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Accelerating innovation and technology commercialization through patents

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With over a decade of extensive experience in intellectual property (IP), market research and technology research, Abhijeet has worked with corporate clients to help them power innovation and make confident IP & business decisions to achieve their business objectives. His areas of expertise include IP strategies, prior art searches, Invalidation, FTO, technology scouting, market assessment, partner identification, anti-counterfeit activity and IP management. Abhijeet has conducted several IP and technology related workshops for clients to understand business opportunities.

Before joining Clarivate Analytics, Abhijeet worked for Sandoz India Pvt Ltd and FutureBridge. In Sandoz India Pvt Ltd, Abhijeet was working in production department. At, FutureBridge he was in research and advisory department to provide IP, technology and strategic solutions to the customers.

Abhijeet, holds a bachelor's degree in Chemistry from Mumbai University and MBA degree in Operations from Sikkim Manipal University.

Agenda

1. What is a patent?
2. Key criteria to file a patent
3. Overview of patent filing procedure
4. Patent as an Innovation acceleration parameter
5. How to explore commercialization opportunities through patents?

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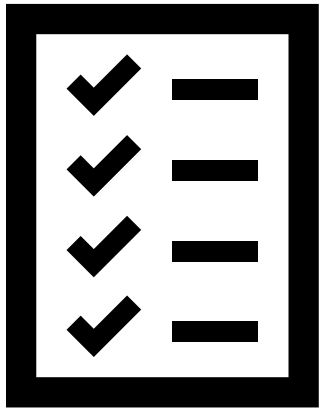
What is a patent?

Patent provides exclusive legal rights of the invention to the applicant

What is Patent?

A patent is a form of intellectual property that gives its owner the legal right to exclude others from making, using, or selling an invention for a limited period of years in exchange for publishing an enabling public disclosure of the invention

Importance of patent



- Exclusive rights of invention for 20 years
- Provides competitive advantage
- Protects against copying of the invention
- Higher returns on investments

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Different parts of the patent will be useful to understand the invention and its benefits

(12)Indian Patent Application

(21) Application Number: 201721041497

(22) Filing Date: 20/11/2017 (43) Publication Date: 22/12/2017

(71) Applicant(s): GOVIND BHAGWAN KOLEKAR
RAJENDRA VUSHWANATH SHEJWAL

(72) Inventor(s): KOLEKAR, GOVIND BHAGWAN
SHEJWAL, RAJENDRA VISHWANATH
ANBHULE, PRASHANT VIKRAM
GUNJAL, DATTATRAY BALHARI
NAIK, VAIBHAV MAHABLESHWAR (1 more...)

(51) International Classifications: A61K 49/00

(54) Title: CARBON DOTS-FE3+ SYSTEM AS A DUAL PROBE FOR THE SELECTIVE DETERMINATION OF D-PENICILLAMINE.

(57) Abstract: Nowadays, it becomes noteworthy to develop dual mode nanosensors, gained tremendous interest in recent years, owing to their low cost for the analysis and facile synthesis procedure. Herein we have synthesized highly fluorescent carbon dots (CDs) from Mahogany fruit shell by chemical oxidation method. The as prepared CDs exhibited selective and sensitive quenching of fluorescence by Fe3+ metal within linear range 0-12µg mL_1and also accompanied with dramatic increase in absorption intensity. Hence these two processes led to fabricate CDs-Fe3+ system as a dual probe. However, D-PA has much affinity toward Fe3+ which resulted in recovery of almost 75% fluorescence intensity and decrease in absorption of CDs-Fe3+ system. Thus, this tendency has been exploited for the selective detection of D-PA by both Spectrofluorimetrically and UV-Visible spectroscopically and showed wide linear range,0-48µg mL-1 and0-40µg mL"1 respectively. This developed probe offered low cost, high selectivity, repeatability, facile operation and excellent recovery ratio in detection of D-PA in pharmaceutical samples which exhibited ideal dual sensing platform for determination of D-PA.

- Patent Number
- Filing Date
- Publication Date
- Grant Date
- Inventors
- Applicants
- Title
- Abstract
- Claim
- Description

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Key criteria to file a Patent

Key criteria to file a patent

Novelty: Invention should be new/novel in nature

Non-Obviousness / inventive step: a feature of an invention that involves technical advance as compared to the existing knowledge or having economic significance or both and that makes the invention not obvious to a person skilled in the art

Industrial Application: Invention should have industrial applicability

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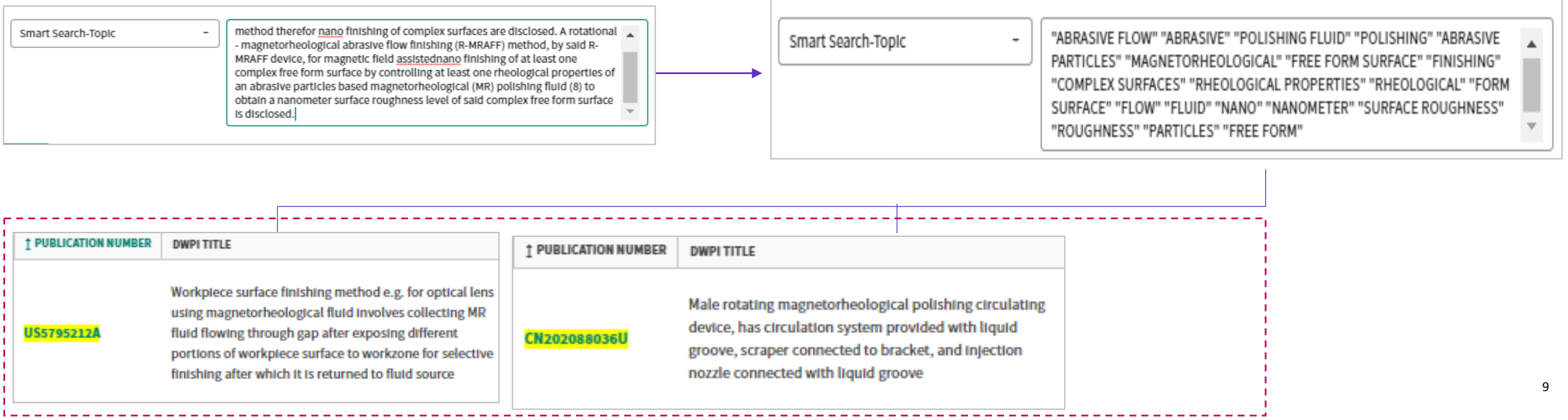
Understanding the prior arts before filing patent (Source: Derwent Innovation)

Title: ROTATIONAL MAGNETORHEOLOGICAL ABRASIVE FLOW FINISHING (R-MRAFF) DEVICE AND METHOD THEREFOR NANO FINISHING OF COMPLEX SURFACES

A rotational magnetorheological abrasive flow finishing (R-MRAFF) device and method therefor nano finishing of complex surfaces are disclosed. A rotational - magnetorheological abrasive flow finishing (R-MRAFF) method, by said R-MRAFF device, for magnetic field assisted nano finishing of at least one complex free form surface by controlling at least one rheological properties of an abrasive particles based magnetorheological (MR) polishing fluid (8) to obtain a nanometer surface roughness level of said complex free form surface is disclosed.

Smart Search



Understanding the novelty, uses and advantages of patent documents by comparing the developed invention

Example:

Information in Original Document — **US201902081 20A1** — **Information Provided by Derwent Innovation**

Title: Image Processing in an Unmanned Autonomous Vehicle

Abstract: Embodiments include devices and methods for processing an image captured by an image sensor of an unmanned autonomous vehicle (UAV). A processor of the UAV may determine a body coordinate matrix of the UAV. The processor may determine an estimated rotation of the image sensor of the UAV. The processor may determine an estimated rotation of the UAV. The processor may transform an image captured by the image sensor based on the body coordinate matrix, the estimated rotation of the image sensor, and the estimated rotation of the UAV.

Novelty

The device has a bearing seat (16) fixed on a mounting base (15), a polishing wheel (1) and a circulating system. The polishing wheel is installed on the bearing seat. The circulating system comprises a liquid storage tank (10). A stirrer is fixed on the liquid storage tank. An injection pipe (8) is provided with a conveying pump (9) and a pressure flow measuring device (7). A circulation system comprises a liquid groove (17). A scraper (20) is connected to a bracket. An injection nozzle (6) is connected with the liquid groove.

Use

Male rotating magnetorheological polishing circulating device.

Advantage

The device avoids the problem of polishing liquid and ensures polishing removal function.

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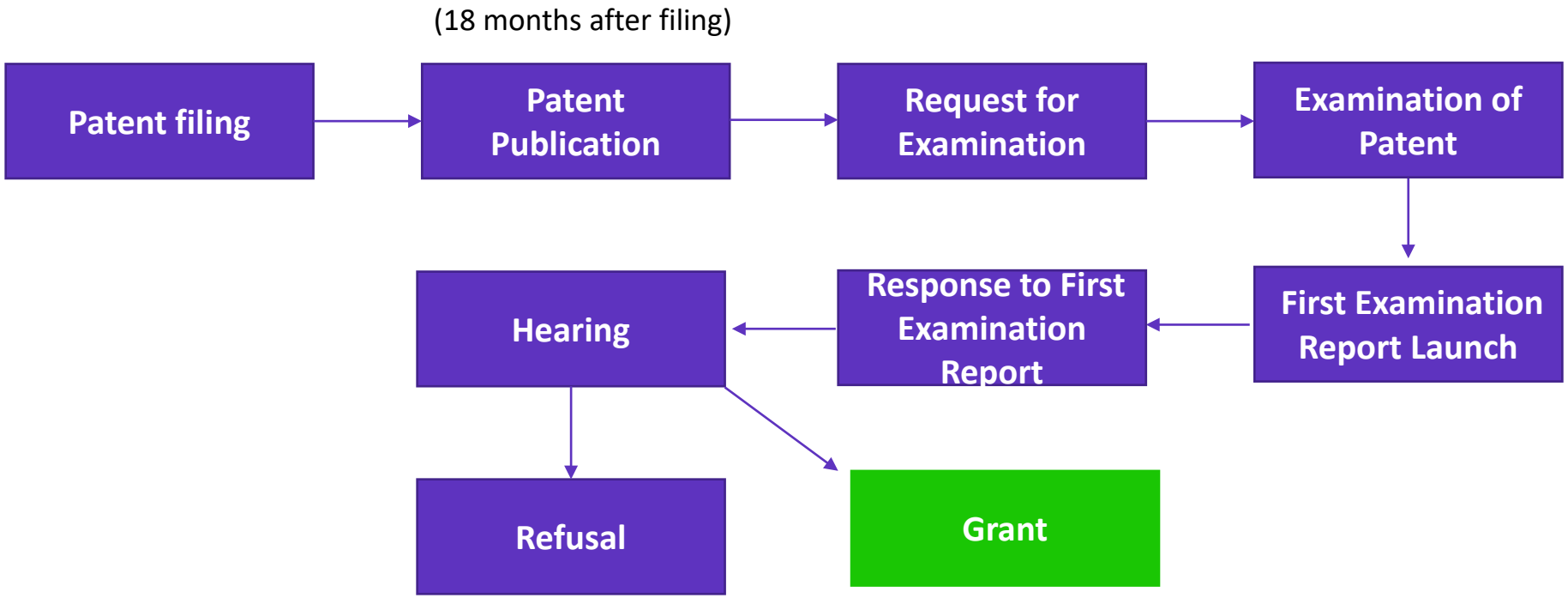
Overview of patent filing procedure

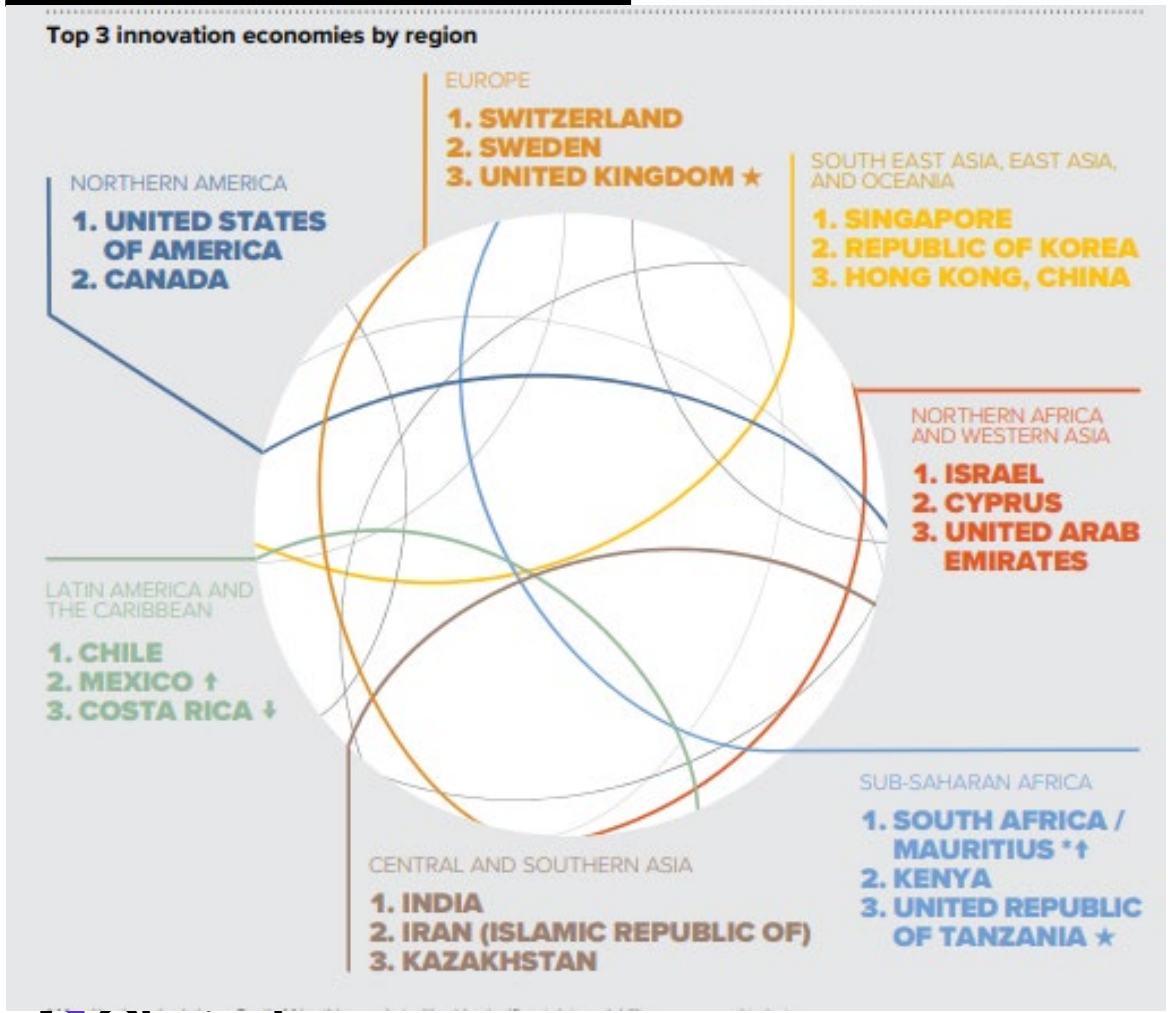
What is the patent filing procedure?



Patent as an innovation acceleration parameter

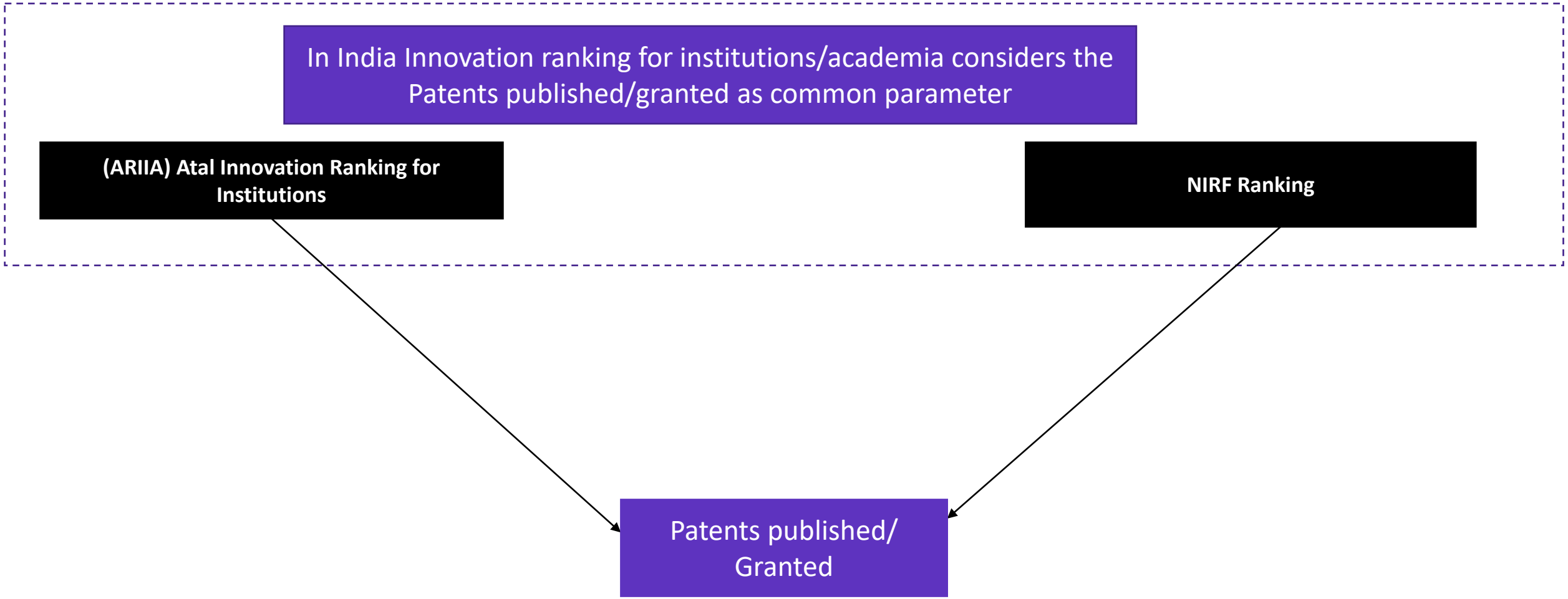
Patent is an innovation indicator at global as well as local level (1/2)

Global Innovation Ranking



- Global innovation ranking published by WIPO has patent families filed in at least two offices as an important innovation indicator
- In 2020 the Global innovation ranking of India was 48

Patent is an innovation indicator at global as well as local level (2/2)



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Patents are useful to accelerate technological innovations and trends

Study conducted by EPO shows that Innovation in fourth industrial revolution (4IR) technologies has accelerated significantly worldwide

From 2010 and 2018, global patent filings for 4IR technologies, which concern smart connected objects and span the Internet of Things, big data, 5G, and artificial intelligence (AI), grew at an **average annual rate of almost 20% - nearly five times faster than the average of all technology fields.**

Nearly 40 000 new International Patent filings were filed for these technologies in 2018 alone. This means they accounted for **more than 10% of all patenting activity worldwide that year.**

Entities prefers filing patents as it will give them:

- Protection & rights of the developed invention
- High ROI on developed invention
- Competitive advantage over conventional technology

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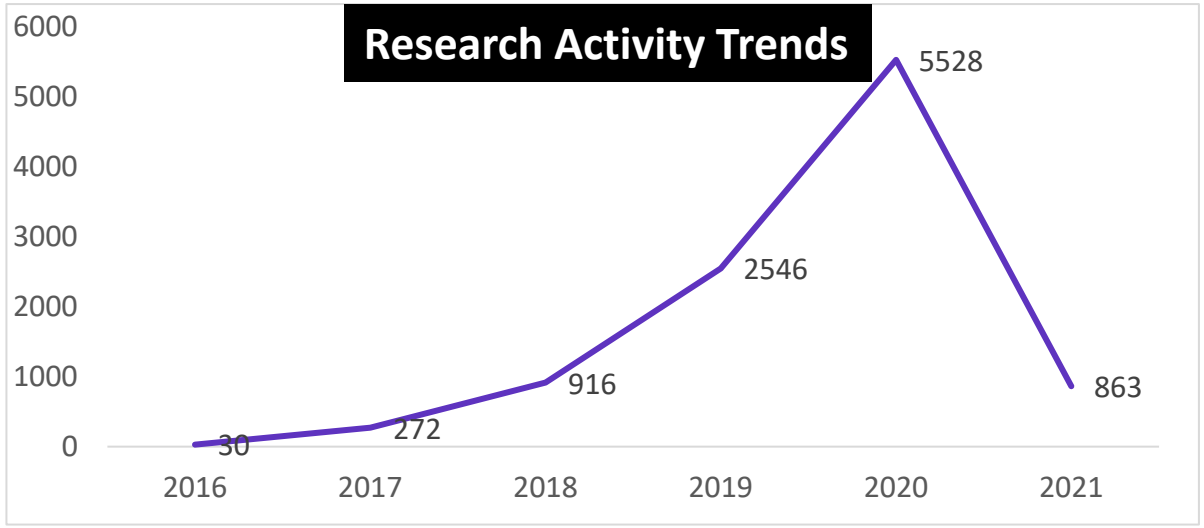
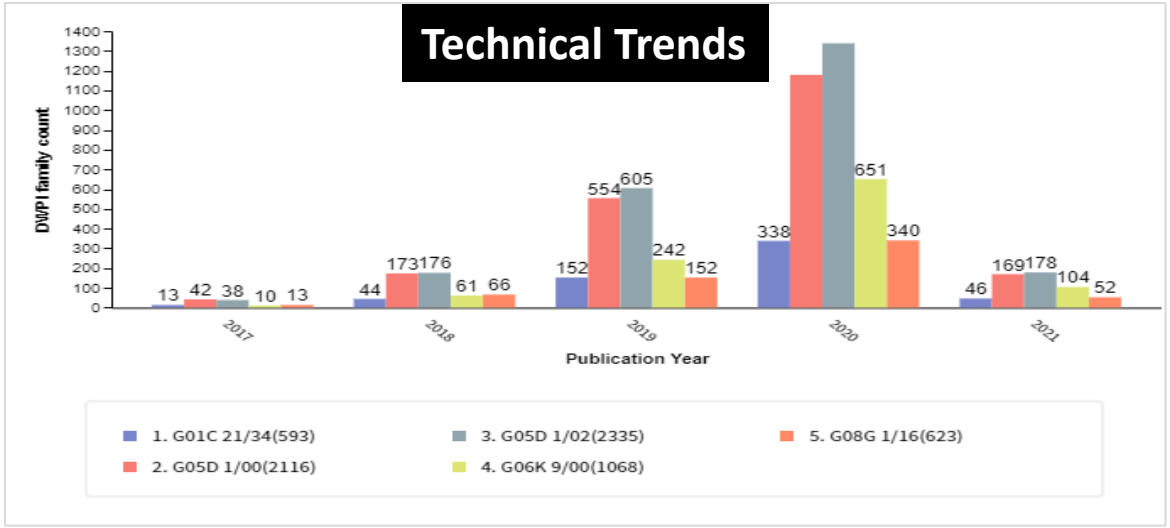
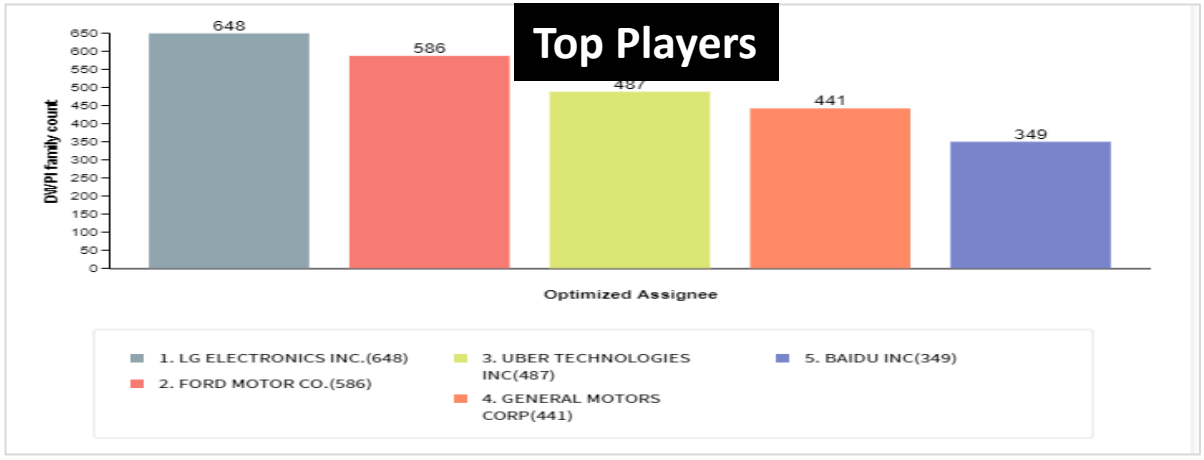
Emerging and research activity trends can easily understand through patenting activity to accelerate the innovation (Source: Derwent Innovation)

Example: Autonomous Vehicle







G01C 21/34:Route searching; Route guidance
G05D 1/00:Control of position, course, altitude, or attitude of land, water, air, or space vehicles, e.g. automatic pilot(radio navigation systems or analogous systems using other waves G01S)
G05D 1/02: Control of position or course in two dimensions
G06K 9/00:Methods or arrangements for reading or recognising printed or written characters or for recognising patterns, e.g. fingerprints(methods or arrangements for graph-reading or for converting the pattern of mechanical parameters, e.g. force or presence, into electrical signals G06K001100; speech recognition G10L001500)
G08G 1/16: Anti-collision systems

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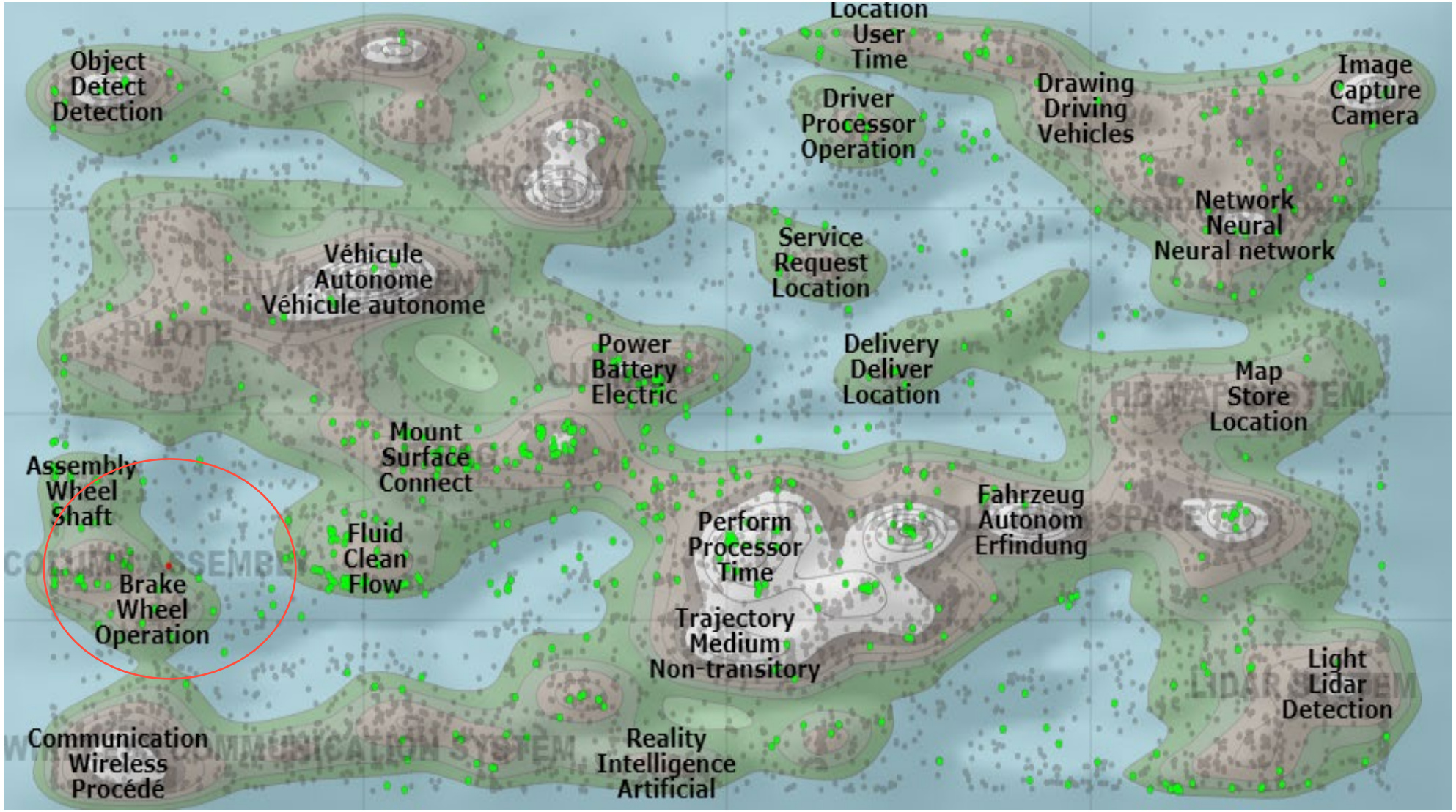
Whitespaces & licensing/commercialization opportunities can also be depicted through patents (Source: Derwent Innovation)



AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY

Ford Motor

- The institute which is highlighted in ThemescapeMap is active in the area of Ford Motors and could be a good opportunity to explore from licensing perspective
- ThemescapeMap has also highlighted areas which can be considered as whitespaces in Autonomous vehicle area for highlighted institute

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Indian start-ups in autonomous vehicle area

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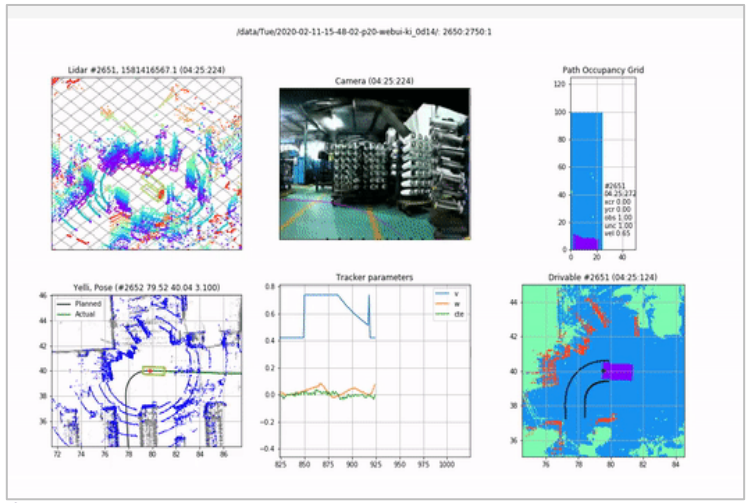
Technology: Autonomous electric cargo vehicles

Founders: V. Vinay, Saurabh Chandra and Saad Nasser



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Swaayatt Robots

Technology: on-and off roads self driving technology that works in extremely difficult traffic scenarios and in unstructured environmental conditions such as in India

Founders: Sanjeev Sharma (IIT Roorkee alumnus)

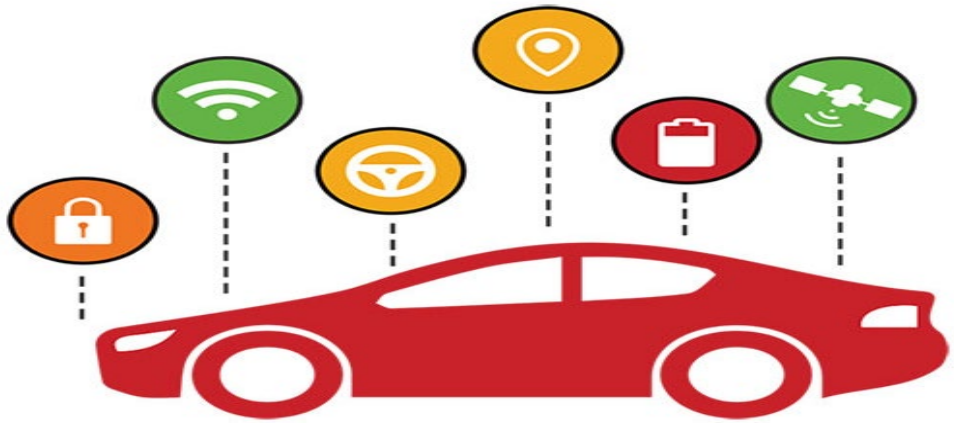
Start-ups active in autonomous vehicle area in Southeast Asia region

A*STAR spinoff company

Technology: self-driving technologies for autonomous vehicles

Founders: Limbu Dilip Kumar, Co-Founder & Director, Anthony Wong, Co-Founder

Country: Singapore



Airovr

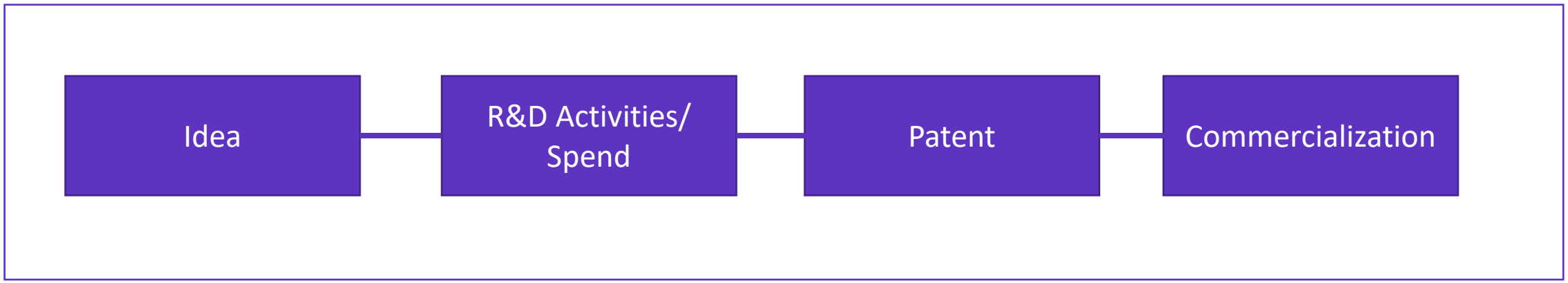
Technology: electric AI (artificial intelligence) self-driving tuk-tuk

Founders: Amares Chumsai Na Ayudhya

Country: Thailand

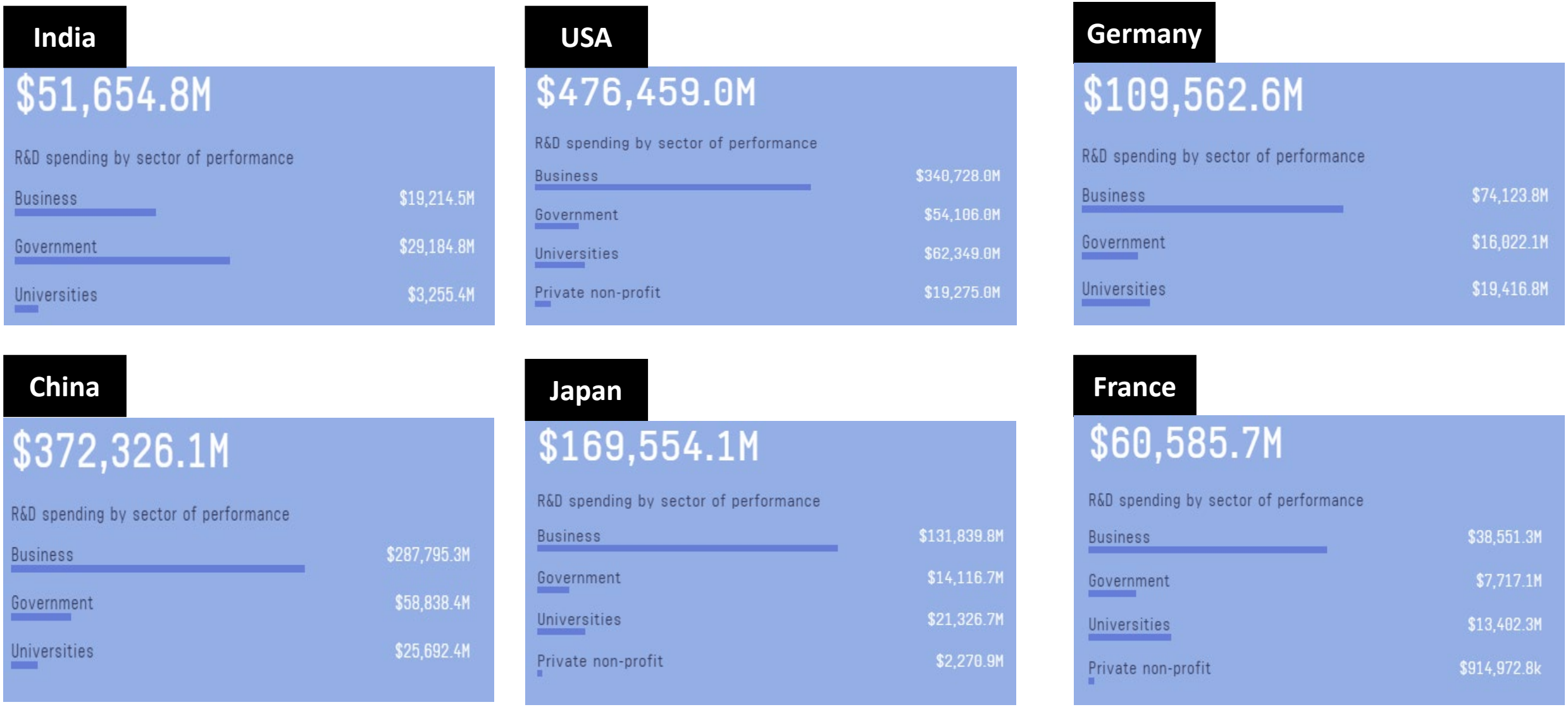
How to explore commercialization opportunities through patents?

What is the relation between patent and R&D spend of the country?



- Filing Patent has positive impact on productivity and growth of the country
- Filing more patents indicate more R&D spend of the country
- Increased patenting activities and R&D spend of the countries provide competitive power of entities and countries through reducing costs of production, improving the quality of products, and allowing the development of new products /methods
- The number of patents are also an indicator of technological innovation of a country

R&D Spending of Some Countries – 2020



Clarivate™ Source: http://en.unesco.org/

Is patent really a cost center?

Reasons behind considering Patent as Cost Center?

- Less awareness about patent benefits 
- Less visibility about licensing/ commercialization opportunities 
- Investment required for filing and maintenance of patents 
- No idea how it is beneficial at international level 

Examples: Inventors who lost opportunities for their ideas due to non filing and non maintenance of patents

1 **John Walker (From UK)**

1827

Invention: The idea of scraping a little stick to make fire

He never patented the idea and because of which he lost the opportunity to get ROI out of it.

2 **Catherine Hettinger (From USA)**

1993

Invention: Fidget Spinner

She patented her design but had to let it lapse in 2005 because she couldn't afford the $400 renewal fee because of which she lost the ROI which companies are earning on it.

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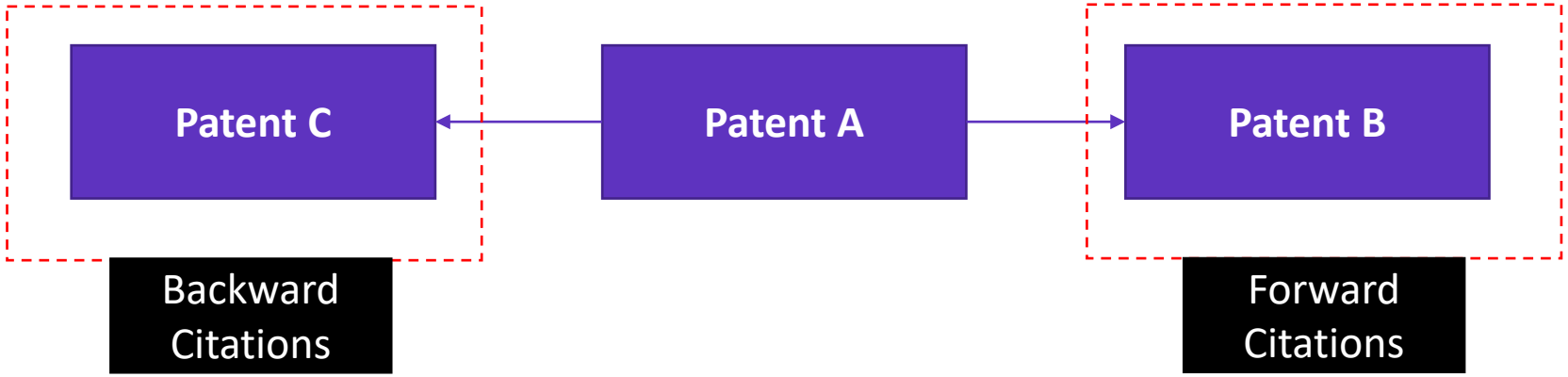
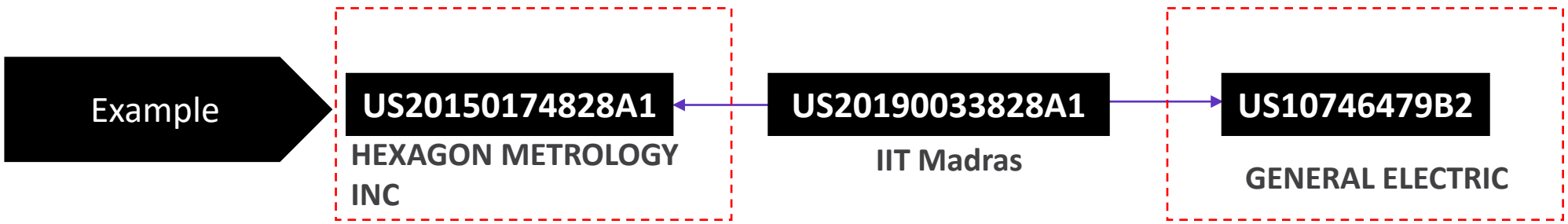
Citation data is the key parameter to understand licensing opportunities for your invention

Definition: Citation is the document cited by applicant/third party because its content relates to a patent application





Source: Derwent Innovation

Licensing & Commercialization deals in India

Deal 1

Indian Institute of Chemical Technology Hyderabad

Patent Licensing Deal Size (2019)	**Rs 240 crore**

Technology Area: Compounds developed by IICT, which have therapeutic properties in the field of oncology, ophthalmology, cardiology and dermatology

Deal 2

Intellectual Ventures Asia

Patent Licensing Deal Size (2012)	**Rs 72 Lakhs**

Twenty-eight solution reports were licensed to IVA for which different patent applications

Licensing & Commercialization deals in Southeast Asia

Deal 1

NTU Singapore

Chinese companies

Patent Licensing Deal Size **$1.7 million**

Institute has facilitated the licensing of five patents with a total value of S$1.7 million (RMB 8.6 million) from NTU to Chinese companies.

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Q&A