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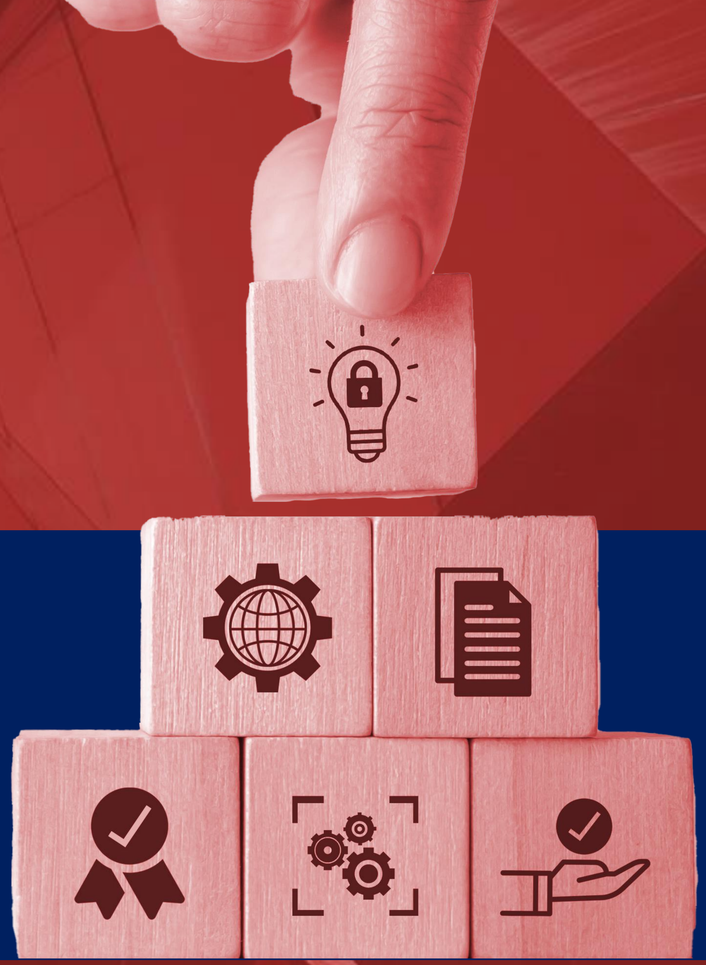
Unpacking India's IP Ecosystem



For an Innovation-led Future

April 2023

Foreword

The rise of emerging technologies continues to be a key growth story across the globe led by cross sector digital transformation, which grew multiple folds during the pandemic. Innovation and intellectual property creation is also moving in that direction with more and more patents being filed in these new age technologies with every passing year.

Continuing with our practise of putting out the latest trends in the Indian patent filing landscape on World IP day, this year in our sixth edition of the report, we focus on patents filed across various emerging technologies in India, along with a critical look at where we as a country lag when it comes to intellectual property creation.

The report covers insights from stakeholders across the ecosystem regarding the patent filing process in India, improvements observed over the last few years, and recommendations to make the filing process a seamless and rewarding experience for all stakeholders, so that India truly becomes an innovation led country.

We hope you find this report interesting and look forward to your suggestions and feedback at research@nasscom.in.

Sangeeta Gupta
Senior Vice President, nasscom

Achyuta Ghosh
Head- Insights, nasscom

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Executive Summary

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Key Patent Filing Trends – The India Story (1/2)

Patent filing in India witnesses significant growth

584K

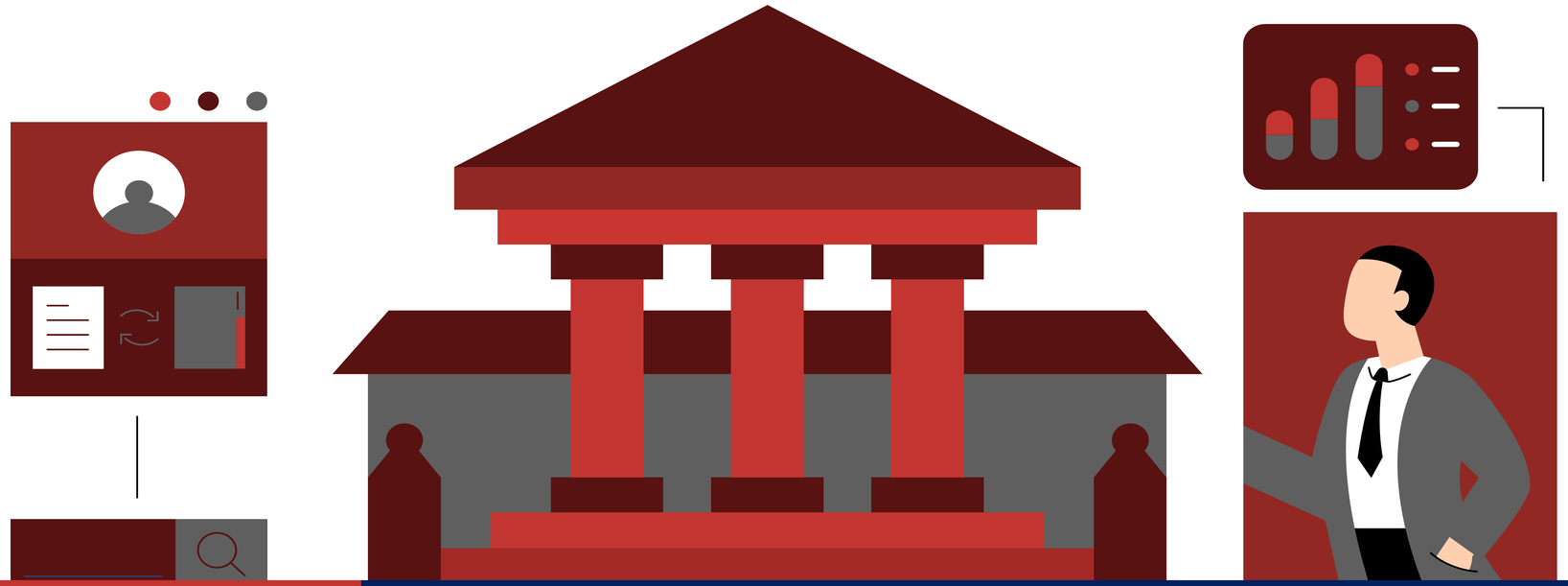
Patents have been filed in India between 2010 to 2022

13.6%

y-o-y increase in patent filings in 2022– **highest annual increase over the last decade**

44.4%

Share of domestic patents filed in 2022, compared to 41.6% in 2021



Note: 2021 and 2022 data is for financial year ending March.
Source: PatSeer, Intellectual Property India - Annual Reports, nasscom Analysis

Key Patent Filing Trends – The India Story (2/2)

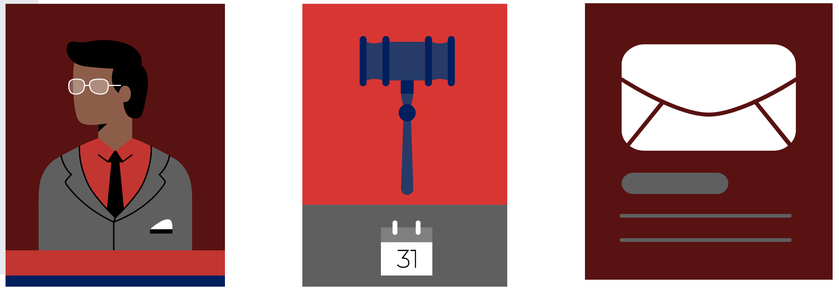
Emerging technologies spearheading this growth

266K (45%)

Technology patents filed between 2010 to 2022p

160K (60%+)

from various emerging technology domains



50%+

of emerging technology patents filed are from **IoT and AI** domains

34%

of emerging technology patents were first filed in the **US,** followed by **India** at **25%**

64%

Share of firms - the major filers, followed by educational and research institutes, and individual inventors

Communication, computer and medical equipment are leading industry applications using emerging tech

Total Tech Patents

Emerging Tech Patents

Note: 2021 and 2022 data is provisional and is for calendar year
Source: PatSeer, nasscom Analysis

India Patent Filing Process – The Hits & The Misses (1/2)

The Hits

Growth driven by initiatives led by the Indian Patent Office

- Modernisation, digitisation of the filing process
- Improvement in the time to examine and granting of patent
- Awareness campaigns and workshops
- Incentives for start-ups, MSMEs, and educational institutes
- Focus on recruitment of examiners
- Faster patent grants under Prosecution Highway Pilot Program with Japan
- Fast tracking opportunity for educational institutes and start-ups

The Misses

Huge gap to be bridged compared to global counterparts

~20

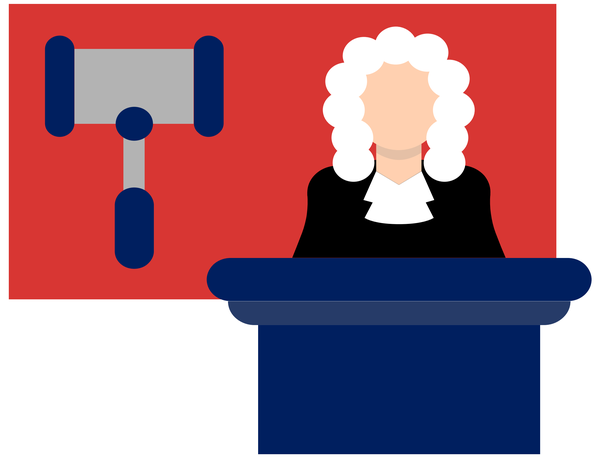
resident patent applications per million population, compared to 1,770 in Japan as of 2021

~300

resident patent applications per USD 100 billion of GDP, compared to 5,738 in China

3X

average pendency time on a patent compared to Japan



Source: WIPO, Primary interviews and nasscom Analysis

India Patent Filing Process – The Hits & The Misses (2/2)

Challenges highlighted by stakeholders

- Uncertainty on timelines for granting patents, and response from examiners
- Lack of expertise at the patent office
- Certain legal clauses which delay the whole process
- Cost overruns for patent filing
- Cumbersome patent filing process
- For academia, lack of recognition for patents compared to research publications
- Lack of software patentability
- Lack of awareness on incentives and schemes across filers

Source: Primary interviews and nasscom Analysis

Best Practices & Recommendations

Best practices followed by patent creation leaders

Organisations: Focus on creating a culture of Innovation

- Reward and recognition programs
- Setting up of separate business and providing ESOPs to the inventor
- Focus on building awareness of IP creation
- Common portals which give out details of the whole patent process
- Strong due diligence and governance process supported by company's senior leadership
- Separate Research and Innovation team/ Centre of Excellence

Academia: Creating an IP cell which:

- Works on due diligence for every patent filed
- IP awareness through various programs and workshops
- Engagement with licensing partners and investors
- Industry collaboration

Recommendations for stakeholders

Patent Office

- Formulate clear timelines for each task in the patent filing process
- Build expertise among the examiners
- Restructure challenging legal clauses
- Resolve issues with patent filing website
- Support academic institutes and MSMEs in patent filing

Other Stakeholders

- Industry – Support Patent Office in training examiners
- Legal Counsels/Law Firms – Need to upgrade their knowledge across various technologies
- Associations & Academia – Create IP awareness and facilitate stakeholder collaborations
- Patent Filers - Focus on quality of patents and not numbers of patents filed

Source: nasscom Interviews and Analysis

Objectives & Approach

02

Objective

To understand the Emerging Technologies patents landscape in India - by studying the patents filed by various companies since 2010 till 2022.
Areas considered for analysis include:

- **Sub-technologies**
- **Country of Origin**
- **Application Areas**
- **Assignee Type**
- **Legal Status**

Approach

The study has been conducted for major Emerging Technology patents filed in India, through data extracted from PatSeer Patent Database as of December 2022 for the period 2010-2022, where the patent filed is in 'India' as Jurisdiction. 'Jurisdiction' is a pre-defined parameter in the database, and includes patents filed in a particular country

- **2021-2022 data is provisional data (denoted by p)**, considering there is a window of approximately 18 months from the filing date to the publication date, thus some of the patent applications filed for 2021-2022 may not have been published (disclosed in the public domain) yet
- The analysis is performed based on 'Patent Family'. This implies that if a particular technology patent family has two members, only one patent reference has been considered for this analysis
- Data sourced from Indian Patent Office is for financial year ending March, while data from PatSeer is year ending December. For comparison purposes the equivalent periods have been used.

Interviews with key stakeholders were conducted to understand the patent filing process in India and best practices followed by organizations to drive patent filing.

- 14 interviews were conducted during March-April 2023 - 7 technology companies (including one start-up); 2 attorneys and 5 academic institutes

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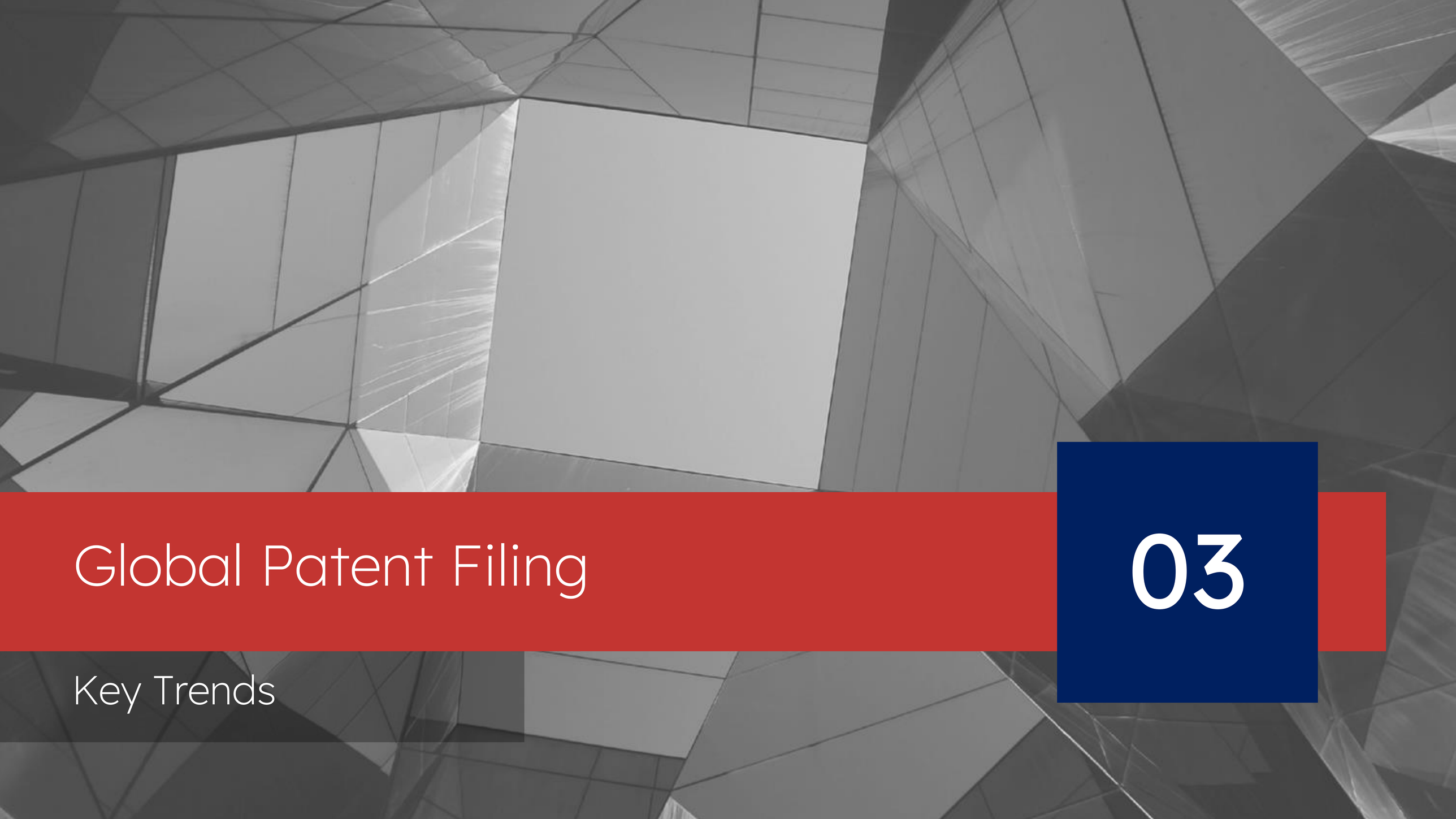


Global Patent Filing

03

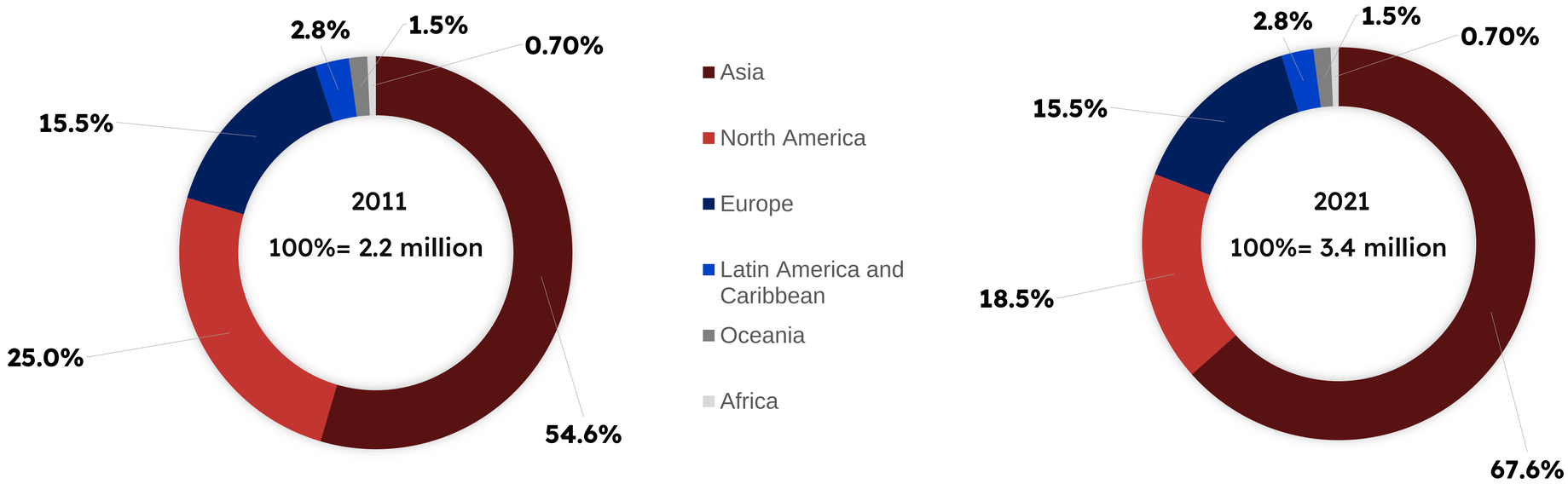
Key Trends

~70% Of Patents Filed Globally Are In Asia

As global patent applications returned to pre-Covid-19 levels in 2021

3.4 million total patent applications were filed in 2021, marginally higher than the pre-COVID peak of 3.3 million filed in 2018

Share of Patent Applications by Region, 2011 and 2021



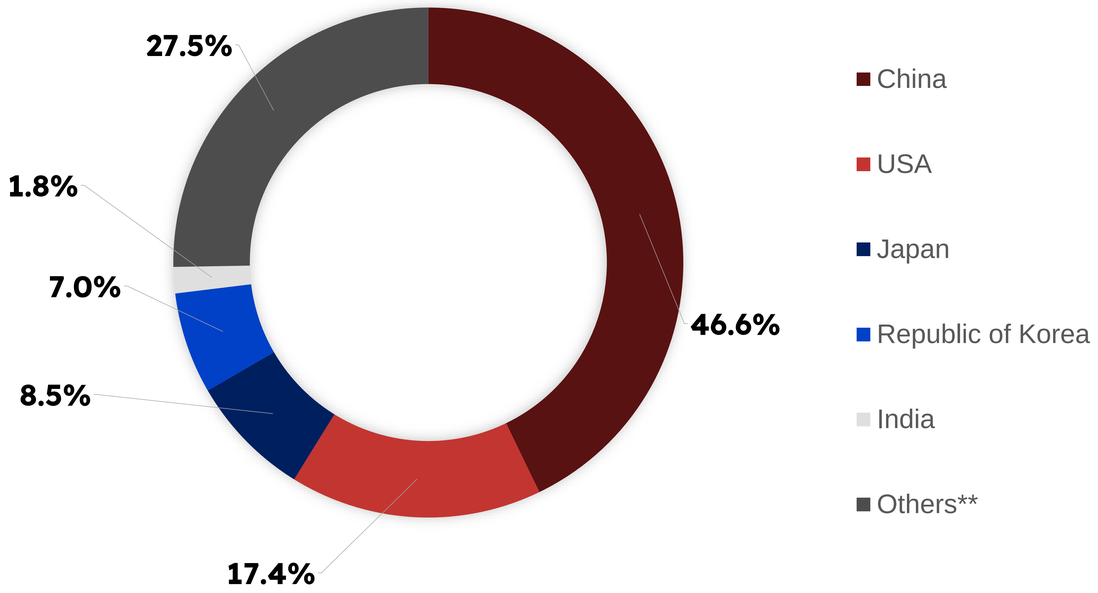
Source: WIPO, nasscom Analysis

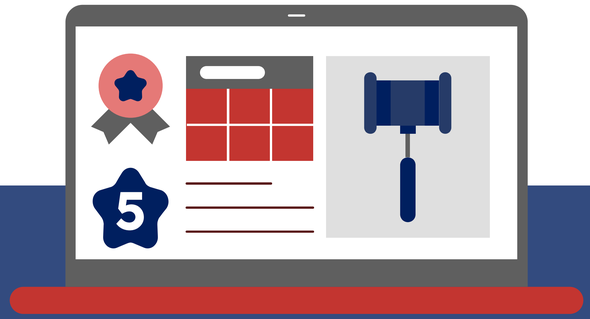
Rise In Asia Is Led By China

With over 45% of the patents filed in 2021

Top Countries by Patent Applications Filed - 2021

100% = 3.4 Million





1.59 million patent applications were received by China patent office in 2021, which was more than double the number received at the US patent office

India ranks fifth* among the top countries with 61,573 patent applications filed in 2021

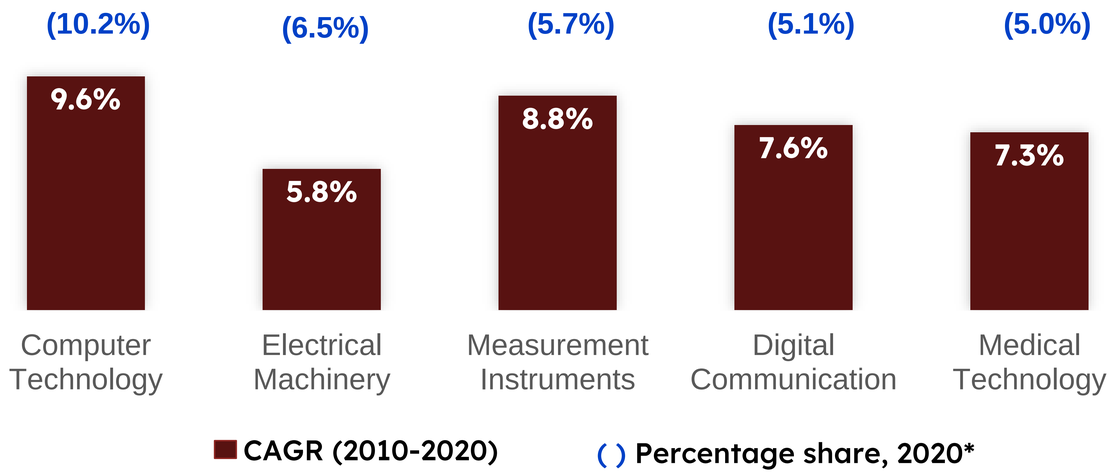
* Excluding European Patent Office, which received 1,88,778 applications in 2021. In general, national offices of the EPO member states receive lower volumes of applications, as EPO provides protection within any EPO member state.
** Others include EPO, Germany, Canada, Australia, Russia, Brazil, Hong Kong, UK, Mexico, France, Singapore, Italy, South Africa, Israel and Indonesia
Source: WIPO, nasscom Analysis

Computer Technology Patents Lead Globally

With an average growth of 9.6% over 2010-2020

One-tenth of patent applications published worldwide in 2020* were in the field of computer technology

**Share of Patent Applications and CAGR Growth (%)
By Top 5 Technology Fields**



Computer technology leads in growth among the top technology fields, followed by measurement instruments

The top five fields of 2020 have continued to occupy the top five spots in the ranking since 2012, although in a variable order

Together, they accounted for nearly one-third of all patent applications globally, an increase of five percentage points from a decade earlier in 2010.

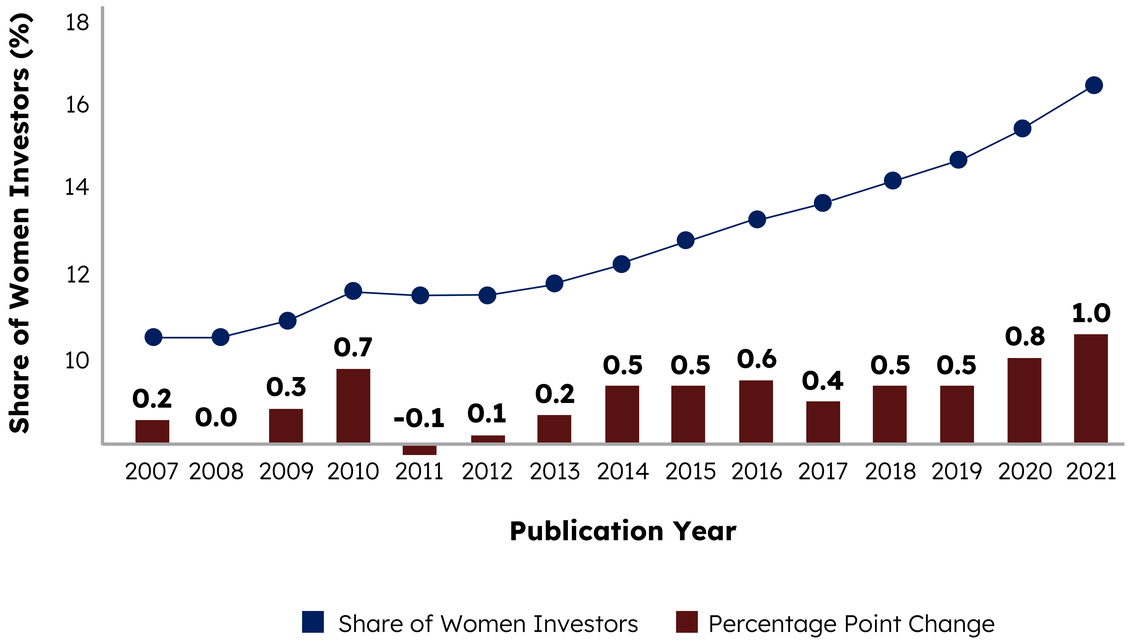
*Latest data available with WIPO basis complete data available due to the delay between application and publication. Others include for a number of sub-technology areas across electrical engineering, instruments, chemistry, mechanical engineering with each accounting for less than 5% share in the total 3.1 million.

Source: WIPO, nasscom Analysis

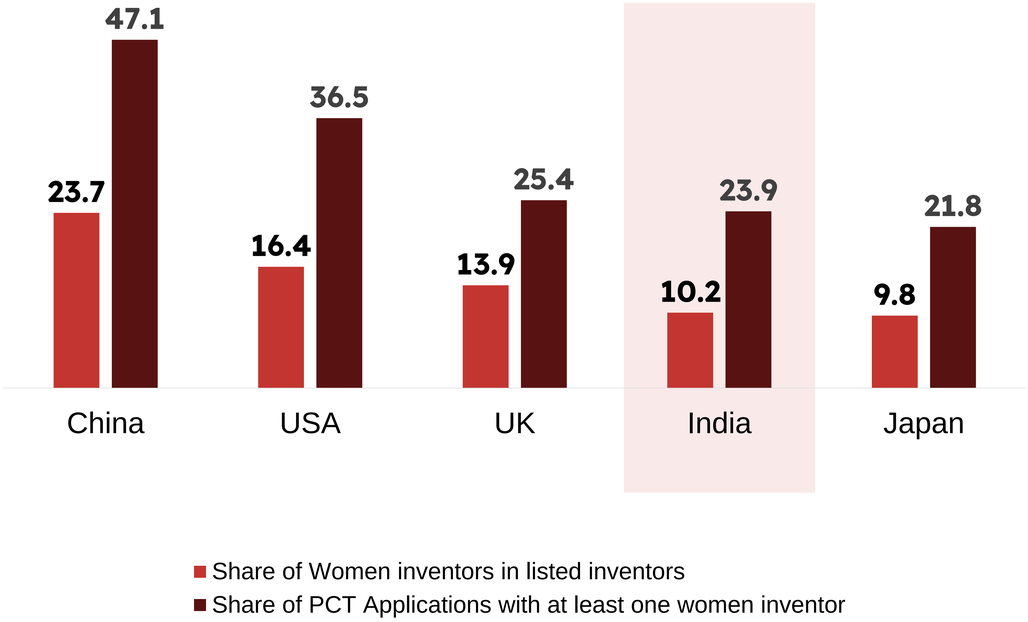
Share Of Women Among Listed Inventors Globally

Filings have increased continuously since 2011

Participation of women in global PCT Applications*

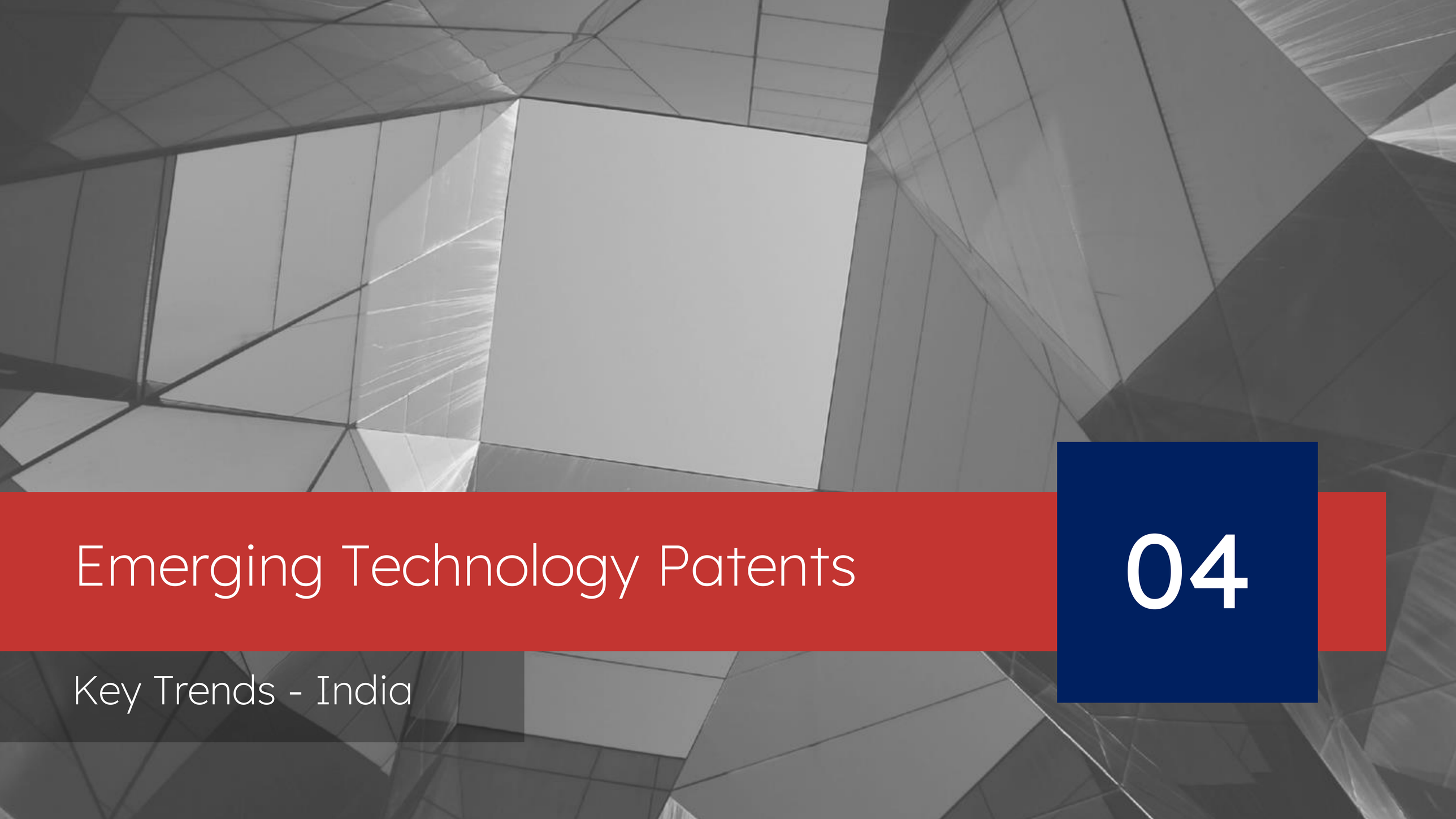


Participation of women in PCT Applications* (%), Major Countries



*Data calculated only for top 20 origin countries. In order to attribute gender to inventors' names recorded in PCT (Patent Corporation Treaty) applications, WIPO produced a gender–name dictionary based on information from 13 different public sources. Gender is attributed to a given name on a country-by country basis, because certain names may be considered male in one country but female in another.

Source: WIPO Statistics Database, September 2022, World Intellectual Property Indicators 2022, nasscom Analysis



Emerging Technology Patents

04

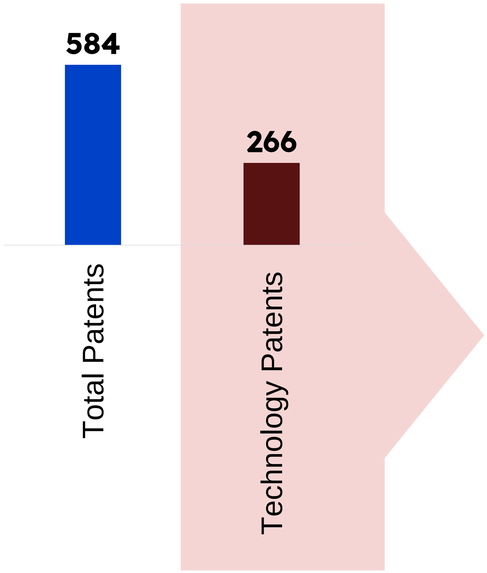
Key Trends - India

584K Patents Filed In India Between 2010-2022

Of which 266k were from the technology domain

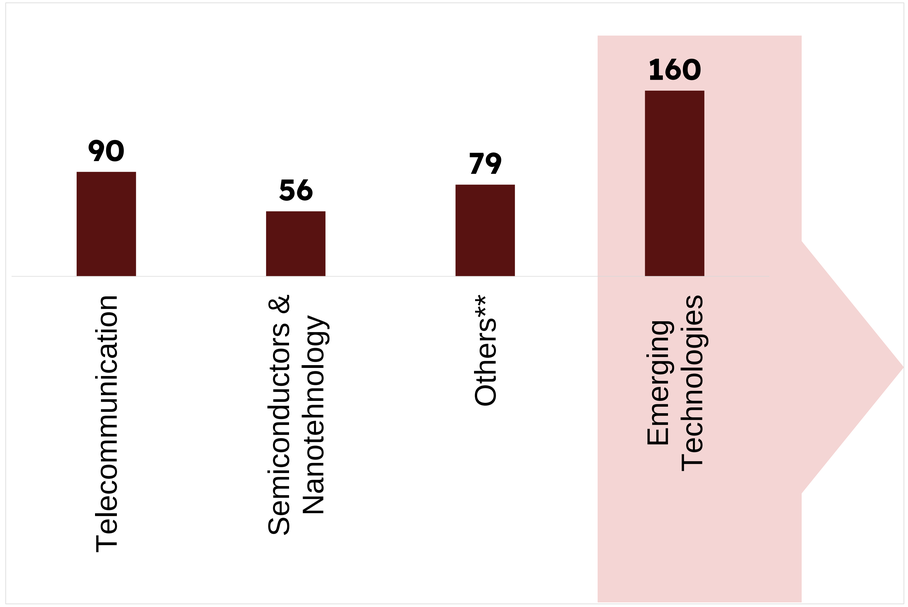
Total Patents filed in India (in 000s)

2010-2022#



Number of Technology patents filed in India (in 000s)

2010-2022*



Technology Patents accounted for 45% of all patents filed in India over 2010-2022

Of the total patents filed in telecommunications ~2100 patents (2.4%) were related to the emerging areas of 5G and 6G

Key Emerging Technology Areas

AI - Neural Networks, NLP, Computer Vision	Blockchain
Pattern Matching and Image Analysis	Cloud, Edge & Real Time Processing
Big Data	Cyber Security
IoT - Building/ Factory Automation, Smart Wearables, Connected Healthcare and Vehicles	Electric and Hybrid Vehicles, Autonomous Driving, Ride Sharing/Traffic Control

#Note - India patent data is based on Financial Year April to March sourced from India Patent Office Annual Reports, while Technology patent data is for calendar year, sourced from PatSeer

*The distribution is based on automated numbers generated by the patent database using logical combination of key-words and classification-based strings. Also, distribution of technology is not mutually exclusive that means that one patent may be covering more than one tech-domain. The total filed patents count during the period is ~266k.

**Includes AR/VR, Additive Manufacturing, Location Tracking, Predictive Maintenance Quantum Computing

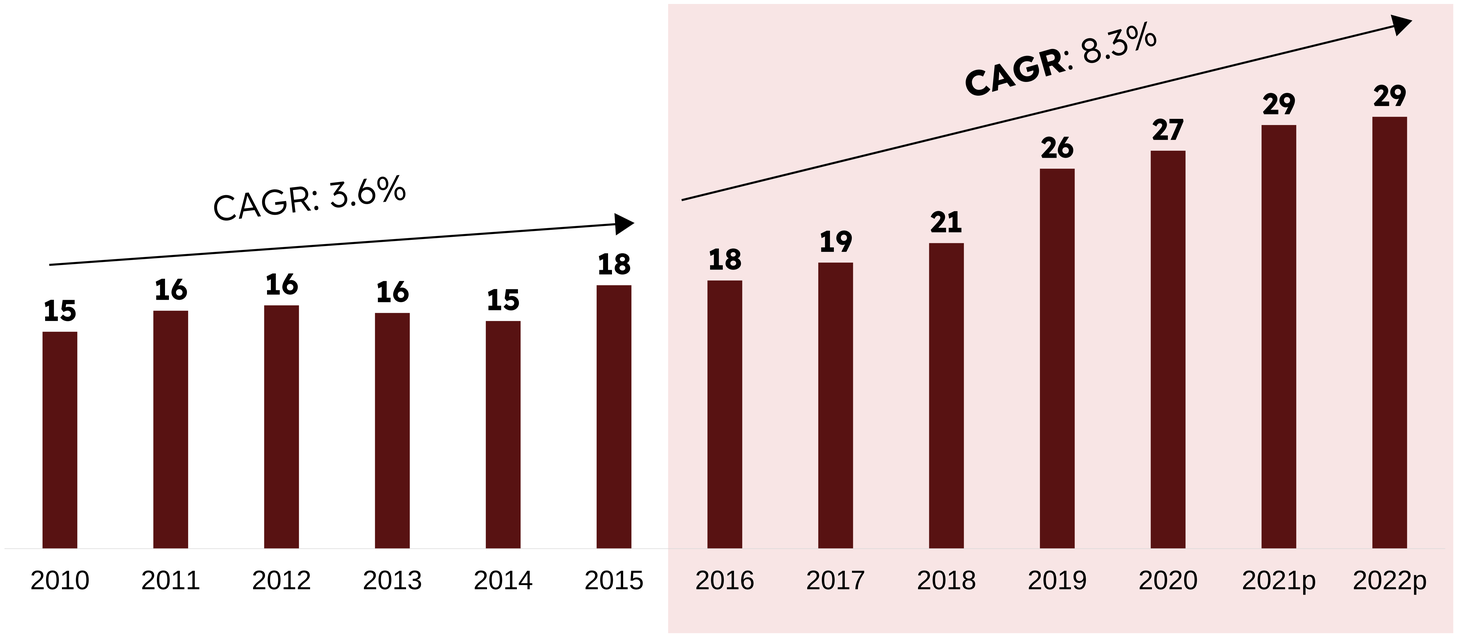
Source: PatSeer, Intellectual Property India - Annual Reports, nasscom Analysis

~50% Technology Patents Filed In Last 5 Years

Emerging technologies lead with over 60% share

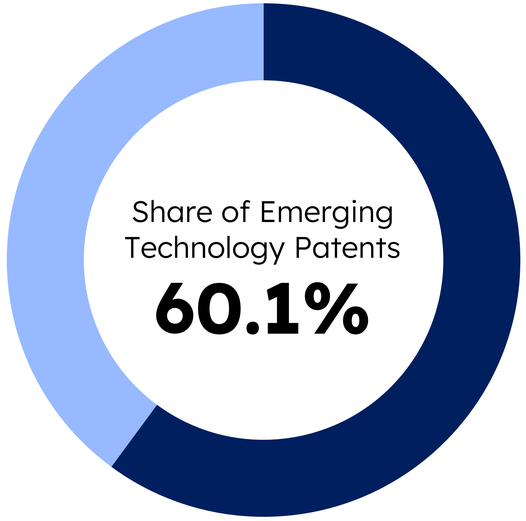
Number of Technology Patents Filed in India (in 000s)

2X Growth during 2016-2022p compared to 2010-2016



Share of Emerging Technology Patents in Total Technology Patents

2010-2022p | 100% = 266K

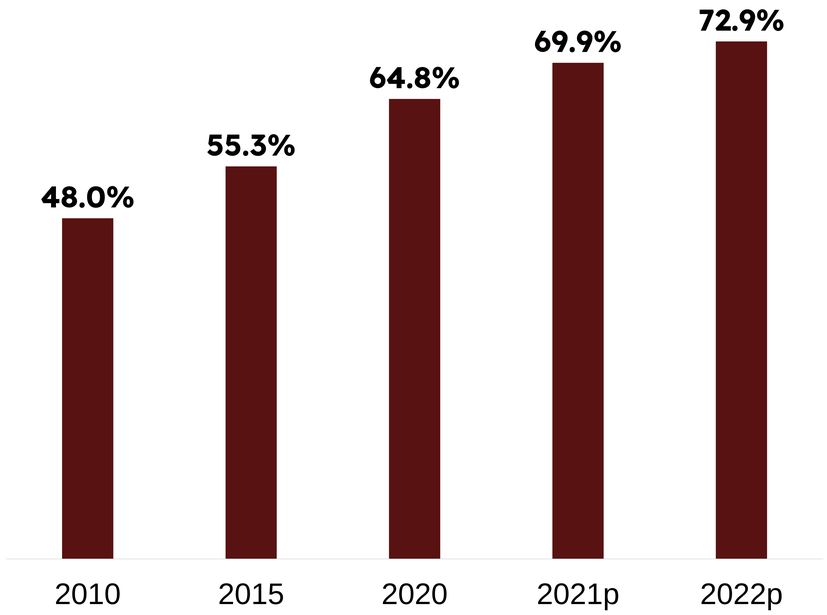


Note – p reflects provisional data for that particular year
Source: PatSeer, nasscom Analysis

Emerging Technology Patents Share At ~73% In 2022p

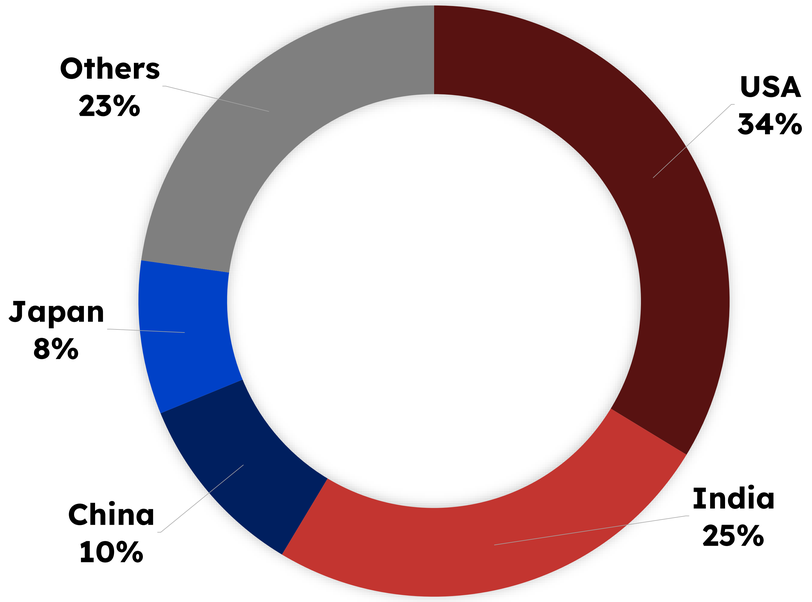
Increasing consistently

Share of Emerging Technology Patents in Technology Patents filed in India



Share of Emerging Technology Patents By Country of Origin

2010-2022p | 100% = 160K



34% of the emerging technology patents originated in the US, followed by India which accounted for one-fourth of the total emerging technology patents filed in the country

Of all patents only 13% have been granted, with the patent grant ratio improving considerably in the last four years

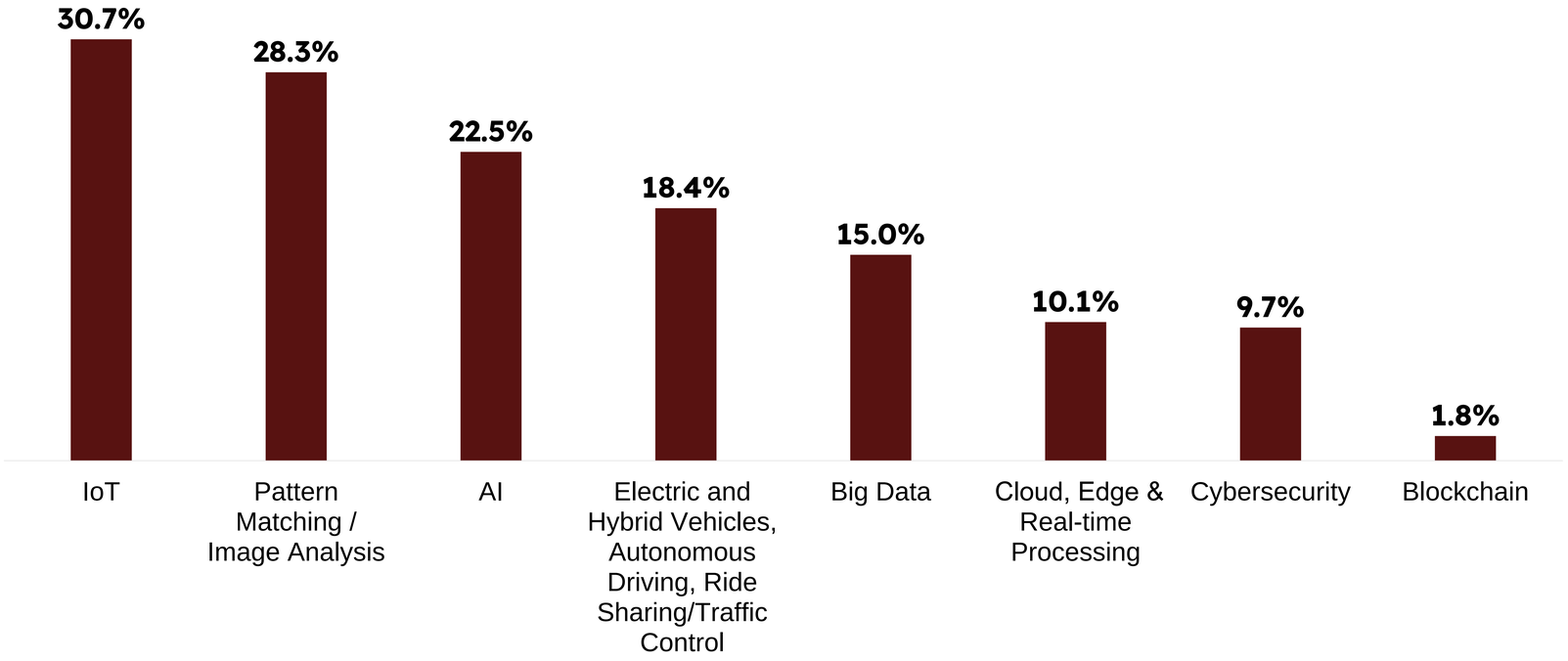
Note – p reflects provisional data for that particular year
Source: PatSeer, nasscom Analysis

IoT And AI The Leading Technologies

Accounting for over 50% of the emerging technology patents filed over 2010-2022p

Emerging Technology Patents in India-By Various Technologies

2010-2022p | 100% = 160K



AI and IoT continue to lead the emerging technology patents growth story

- Pattern Analysis and Image Analysis emerged an important area accounting for over 28%
- Number of Blockchain related patents witnessed the highest CAGR of 25%+ (though on a small base) over the 2010-2022p
  - Followed by AI and IoT registering a CAGR of over 17% and ~15%, respectively
  - Big data and Cyber Security emerged as the other key technologies registering a CAGR of 10% and 9%, respectively

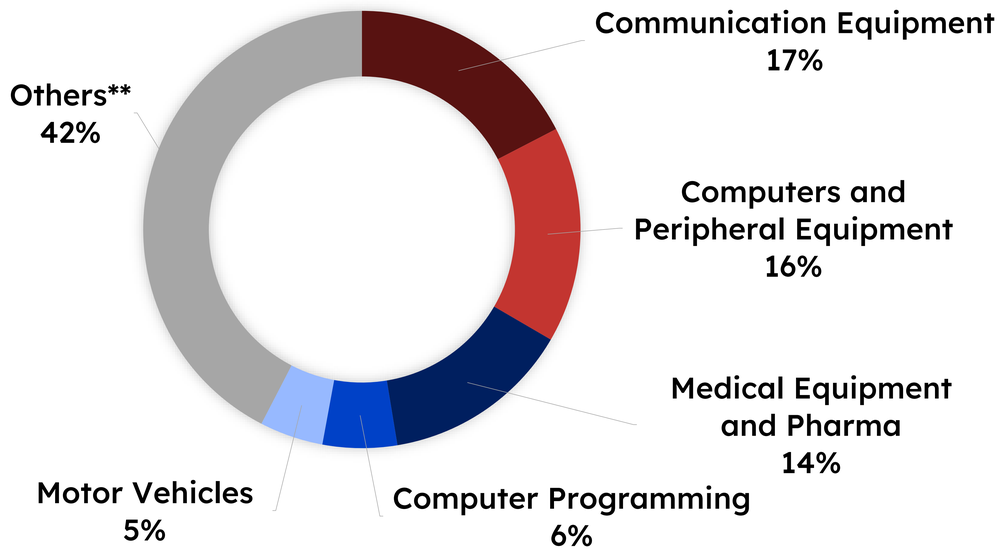
Note – p reflects provisional data for that particular year
Source: PatSeer, nasscom Analysis

Communication, Computer And Medical Equipment

Are leading industry applications for emerging tech patents

Emerging Technology Patents – By Industry Applications

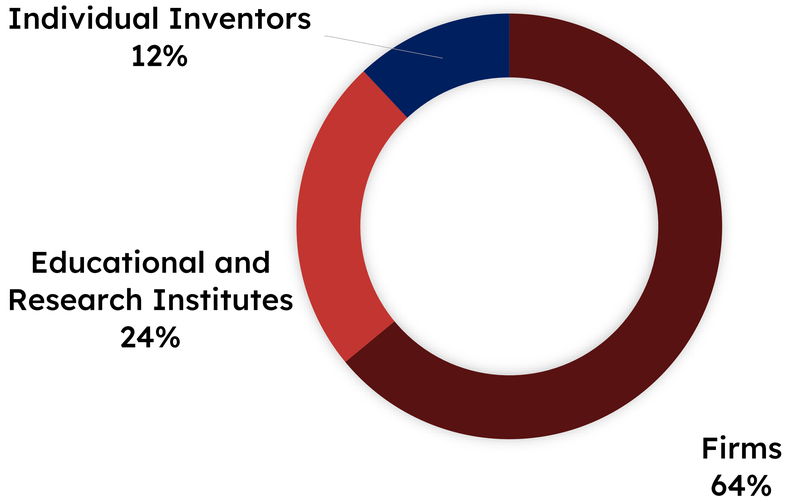
2010-2022p | 100% = 200K*



>60% of the emerging technology patents under computer programming were filed only after 2018

Emerging Technology Patents – By Key Filers

2010-2022p | 100% = 160K



Like their share in total patents the grant ratio# for firms is the highest at 18% followed by Educational Institutes and Individuals with 10% and 5%, respectively.

Note – p reflects provisional data for that particular yea
* Distribution of technology is not mutually exclusive that means that one patent may be covering more than one tech-domain. The total filed patents count during the period is 160k.
**Includes Batteries, Electrical and other types of Machinery, Chemicals and Fertilizers, Textiles and Fibres, Food and Related Industry, Wood and Metal Products etc.
Grant ratio is the share of patents granted in total patents filed
Source: PatSeer, nasscom Analysis

MNCs Leading The Emerging Tech Patent Filing Space

Majority share in the top 100 emerging technology patent filers list

Illustrative

MNCs

Hewlett Packard Enterprise, John Deere, Avaya, Nippon Steel, Knorr-Bremse, Philips, Sumitomo Corporation, Qualcomm, Microsoft, Honda, Panasonic, BD, BASF, Alphabet, IBM, Oracle, Mercedes-Benz, Siemens, Yamaha, Signify, Valeo, Google, Huawei, Roche, Alibaba Group, Ford, Tencent, Schneider Electric, Samsung, Smart Technology for Smarter Mobility, Honeywell, Ericsson, Ricoh, Citrix, Bosch, Smith+Nephew, Porsche, Johnson & Johnson, vmware, ZTE, Nissan, accenture, amazon, Canon, Nokia, Toyota, Hitachi, Saint-Gobain, Foxconn, Intuit, Sony, Alcon, NEC, Fraunhofer, AMD, Cisco, BAE Systems, Toshiba, BlackBerry, Suzuki, ABB, Emerson, Medtronic, intel, 3M, Meta, Bayer, JFE

Indian Companies

TCS, Tata Consultancy Services, wipro, Infosys, Navigate your next, Mahindra, Reliance Industries Limited, TVS, HCL, Mesbro

Educational and Research Institutes

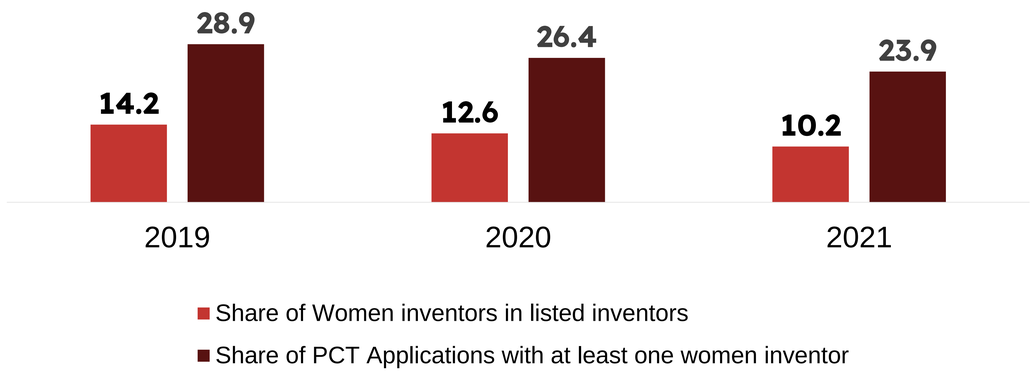
IIT Madras, Indian Institute of Technology Madras, Bharath University, Lovely Professional University, Chitkara Innovation Incubator Foundation, CU Chandigarh University, Amity University, Galgotias University, CGC Chandigarh Group of Colleges, Chandigarh Group of Colleges, Chitkara University Punjab, SRM Institute of Science & Technology, Sanskriti University, JGI Jain Deemed-to-be University, CSIR Council of Scientific and Industrial Research, Hindusthan College of Engineering and Technology

Source: PatSeer, nasscom Analysis

However, Share Of Women Inventors In India

Have declined from 2019 to 2021

Participation of women in PCT Applications* (%), India



India's ranking in women's patent share among the top 20 patent offices shifting from 15th to 18th

This probably indicates the loss of women workforce in innovation teams across post the pandemic.

Share of women inventors in Indian Tech Companies

Illustrative

TATA CONSULTANCY SERVICES

As of FY21 out of the 2,837 unique inventors responsible for the 1,850 **granted patents,** 607 or **21.4%** were women

fractal

As of FY22 approximately **20.3%** of **patents filed** had at least one-woman inventor

LTIMindtree

As of FY22 **25-30% patents filed** had women as the owner / co-owners

*Data calculated only for top 20 origin countries. In order to attribute gender to inventors' names recorded in PCT (Patent Corporation Treaty) applications, WIPO produced a gender–name dictionary based on information from 13 different public sources. Gender is attributed to a given name on a country-by country basis, because certain names may be considered male in one country but female in another.
Note: FY represents financial year ending March.
Source: WIPO Statistics Database, September 2022, World Intellectual Property Indicators 2022, nasscom Analysis

Patent Filing Process in India

05

The Hits and the Misses

Patent Filing Process In India Has Improved

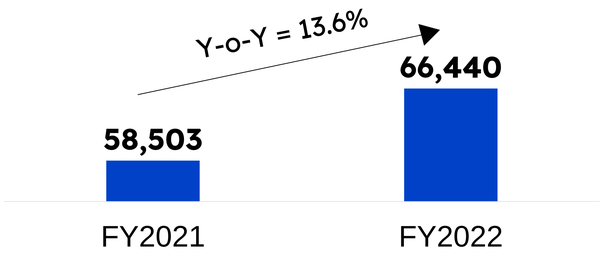
Key driver for increased patents out of India

Indian Patent Office has become very proactive over the last few years…

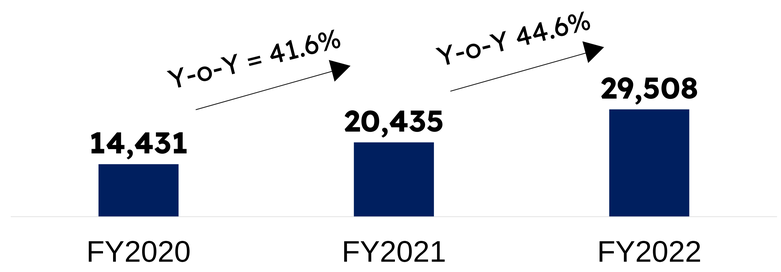
- Modernisation and digitisation of the patent filing process
- Recruitment of examiners
- Time to examine and granting of patent has improved over the last couple of years
- Lot of awareness campaigns and workshops on importance of patent filing and the process
- Various incentives for start-ups, MSMEs, women applicants, educational institutes which included discounted cost of filing a patent
- Fast tracking opportunity for educational institutes and start-ups
- India's first Patent Prosecution Highway Pilot Program (PHP) commenced on November 21, 2019 with the Japan Patent Office enabling faster patent grants

…and the impact is visible

Total Patent Applications Filing (In Nos)



Domestic Patent Applications Filing (In Nos)



NIPAM (National Intellectual Property Awareness Mission) coverage as of 31 Mar 22 in the country:

- **6.1 lakh students and faculty**
- **2,300+ educational institutes**

In Q4FY2022, **patent applications filed by nationals in India** have, for the first time in over two decades, **surpassed those by foreigners**

Average pendency of patent applications at first examination level has been reduced to less than 12 months from the date of request of filing of request for examination in all fields of technology

FY represents Financial Year ending March.
Source: Annual Report 2021-22, Intellectual Property India

Industry Speak

"A lot of proactive steps are being taken, a lot of campaigns are happening. In fact, **the grants have become a lot more speedier**."

MNC Tech Company

"Over the last several years, the Indian Patent Office has taken quite a number of steps, including **modernization, digitization, recruitment of examiners** and so on."

Indian Tech Company

"I think the one of the positive point which I have observed is that of the **fee reduction for educational institutions** which is a big plus from India perspective."

Legal Attorney

"**PHP Benefit that we filed an application in Japan** and we get granted in Japan and we will have that benefit in India is a good initiative that we should look for implementing across many geographies. Specially US can be considered, we could have similar countries some European countries there."

MNC Tech Company

"If you were to talk about the comparative study, I can say that **USPTO needs to learn from Indian Patent Office in terms of the fee structure**. There are no waivers, no subsidies for MSMEs, no waivers, subsidies for educational institutes. (in the US)"

Academic Institute

"If you refer the annual report of Indian Patent Office, we'll definitely see the number of students who have got trained under the mission of **improving awareness**. We would also see the policy reforms which Indian Patent Office has bought in terms of **expedited examination for startups or on women entrepreneurs and all.**

At these scale of initiatives, definitely we have **come a long way in awareness, procedural reforms especially addressing a micro small medium enterprise**. And the feather in our cap to state that of all these years of effort that at least we have seen the **domestic application going up**."

Indian Tech Company

"Thanks to the **Patent Act being amended, we are now filing for expedited application**, therefore, our timelines have considerably shrunk. Also, I think the **examiners are also pretty well qualified these days** and we are filing similar applications all over the world and we are facing similar objections."

Academic Institute

"In India we have all the option for **expedited examination**, early publication online. So this feature reduces the timeline to 1.5 to 2 years for a grant from you know approximately 6 to 7 years. Which is a big plus."

Technology Start-up

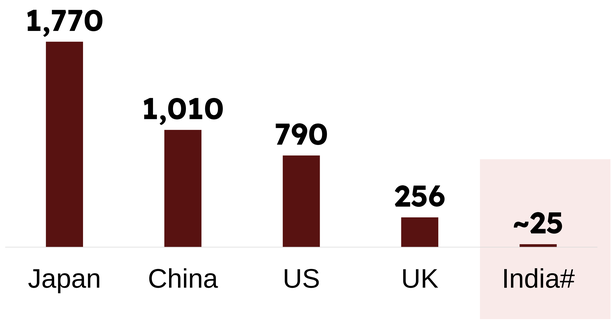
Source: PatSeer, nasscom Analysis

However, Challenges Persist (1/2)

Long Patent Filing Timelines, despite lower per capita patents

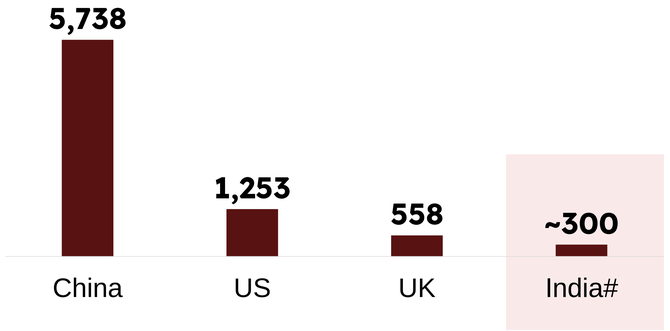
Resident Patent Applications per Million Population

2021#



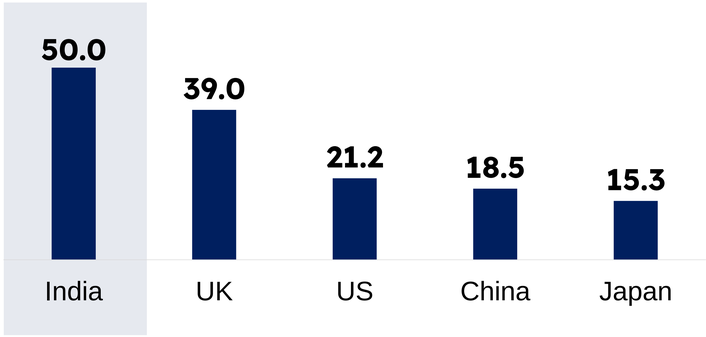
Resident Patent Applications per US$100 billion GDP

2021#



Patent Applications Average Pendency Time for final decision at major patent offices (in months)

2021*



- Resident patent applications filed in the country per million population as well as per USD 100 billion GDP is very low compared to major patent offices, which highlights the need to push domestic patent filing in the country
- Final decision on a patent in India lags considerable compared to major patent offices. Though, the first office action on the patent is quick, the final closure takes considerable amount of time.

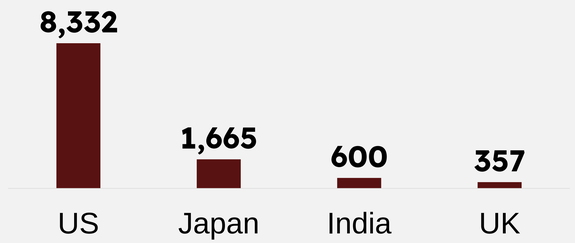
*WIPO collects data from IP offices using a common questionnaire and methodology. However, due to differences in patent procedures between offices, data cannot be fully harmonized. Therefore, caution should be exercised when making comparisons across offices
#India Numbers are calculated based on 2021 patent data from WIPO and GDP (PPP) and Population data from IMF.
Source: WIPO Statistics Database, September 2022, World Intellectual Property Indicators 2022, nasscom Analysis

However, Challenges Persist (2/2)

Lack Of Patent Examiners And Relevant Experience

Number of Patent Examiners at Major Patent Offices

2021

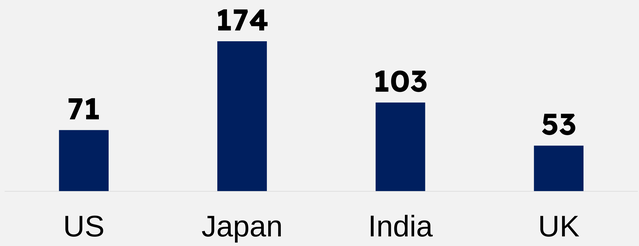


Average Years of Experience of Patent Examiners at Major Patent Offices (in Years)

2021

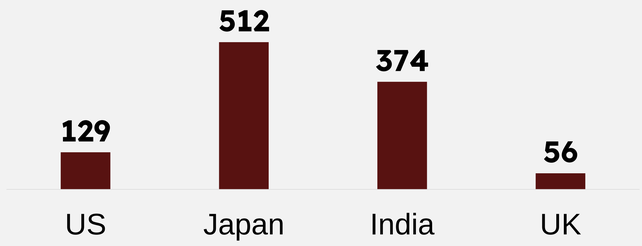
Number of Patents Applied per Examiner at Major Patent Offices

2021



Number of Pending Patents per Examiner at Major Patent Offices

2021



- As of 2021, India had over 200k potentially pending applications, highest among the top 20 patent offices at 91.5% y-o-y
- Few and inexperienced patent examiners makes it even more challenging for the Indian Patent Office to maintain timelines
  - Notably, Japan has one of the lowest pendency time with even higher number of patents per examiner, highlight the efficiency of the whole process and lots of learning for other patent offices including India.

Source: WIPO Statistics Database, September 2022, World Intellectual Property Indicators 2022 , nasscom Analysis

Stakeholder Conversations Also Highlight Similar Challenges

01

Overall higher costs for patent filing

Considering the process requirements, start-ups and academia are required to go through a legal attorney which makes the whole process costly, despite various incentives

02

Uncertainty on timelines regarding

- Final granting of patent
- Response by Examiners

03

Lack of recognition of patents and software patentability

- There is a lack of recognition for patents compared to research publications in the academic domain
- Lack of software patentability limits the number of publications being patented

04

Lack of expertise at Patent Office

- Lack of reasoning for acceptance or rejection of patents
- Office actions are not well thought through

05

Cumbersome patent filing process

- Lack of clarity regarding necessary documentation
- Operational/ Technical challenges with the patent filing website/ patent office
- Lack of awareness on patent schemes

06

Legal Clauses

- Pre-grant opposition
- Section 8 - Foreign filing status
- Section 39 – Compulsion to first file in India
- Article 27 – Working statement

Source: Primary Interviews and nasscom Analysis

Industry Speak

"In fact, for all the applications that we have filed in US, we have got several patents there, but none of them have been granted in India. I think this is itself kind of putting a question mark of how the patent process is. If for the same application we are filing in US and you're getting patents there, here it has not even come to the examination stage. For one of the patents which we got, we got the patent within two months in US. **Also, India doesn't provide that fast-track opportunity for organizations."**

MNC Tech Company

"Office actions that are being received. They are not fully thought through. it doesn't give enough of reasoning as to why there is a rejection or grant whatever. Right now, focus is from the Patent Office is on quantities, but it has to get coupled with the quality also. So I would say that Patent Office can take a reasonable time to grant rather than very strong speed. And then follow it up with good office actions which are well reasoned"

MNC Tech Company

"**If we make patent grant easy and very fast in India, the investor down the road is NOT going to have a lot of confidence** in the in the patents that are granted in India."

Academic Institute

"A **lot of patents are coming from emerging tech domain**, and in 2020 we had a similar request from one of our client and that was very at nascent stage that you know we have certain invention in this area and then our team started looking into it then **we realized that we won't have competency because this is something new and we did not study about this.** So there was no subject expertise for that. So we said sorry we can't do that."

Legal Attorney

"**Patent filing is financially complex** such that an academic who doesn't understand the legal ecosystem needs to kind of circumvent the legal ecosystem and **needs to make a huge amount of money expenses**."

Academic Institute

"So at times there are **challenges in terms of website across browsers**, and the payment gateway doesn't work in the late evening"

Legal Attorney

"Even from an understanding standpoint, it is missing, so **drafting a patent like on various new technologies, it's not something which Indian lawyers or partners are adapted to**, or they kind of lack how to write that data. So what typically I do is I get my US, I get my US lawyers draft the patent application. **And so even the Patent Office is not able to examine the applications**. They don't even know how to go ahead and examine the applications"

MNC Tech Company

Source: Primary Interviews and nasscom Analysis

Organization's Challenges

Uncertainty on timelines, lack of expertise and certain legal clauses

Organizations	Supporting Arguments
Uncertainty on timelines	**Patent Grant -** While faster granting of patents is important, quality can not be compromised for reducing the backlogs. Speed and quality are thus both important aspects of pragmatic patent ecosystem. Currently most office actions generated by the IPO are non-exhaustive in nature **Overall examination is quick, however the entire process is time consuming-** Average patent grant time in India is 2-3X higher than developed countries like US and Japan **Lack of fast-track opportunity for organizations** **Examiners Revert -** Lack of timelines for examiners to revert with objections etc.
Lack of Expertise at Patent Office	**Lack of reasoning for acceptance or rejection of patents from the patent office** **More focus needed on the quality of a patent** to ensure the patents success in case of any legalities
Legal Clauses	**Pre Grant Opposition –** Does not have a fixed time period and is open till a patent is not granted, which is a big challenge for the applicant and delays the process **Section 8 -** A huge administrative burden on the applicant as it requires him/her to furnish all details regarding the status of the patent application in other parts of the world. Non-compliance leads to invalidation of the patent, which should be reconsidered **Article 27 –** Requires businesses to disclose sensitive information, which is then made publicly available. Therefore, it may be advisable to reconsider the information requested in the form and exclude any confidential or sensitive business information **Section 39 -** Compulsion to first file in India even if one inventor across all inventors is from India before the company can file in other jurisdictions **Failing to meet most of these clauses is considered a criminal offence, thus adhering becomes crucial and accounts for additional costs and administrative burden for the organizations**

Source: Primary Interviews and nasscom Analysis

Academia's Challenges

Timelines, process hiccups and lack of software patentability

Academia	Supporting Arguments
Uncertainty on timelines and cost overruns	**Patent Grant –** The issue is not with the time taken to file but the grant time, some patents have taken 10-12 years before they are granted **Examiners Revert -** Lack of timelines for examiners to revert with objections etc. These time overruns makes India a lesser attractive destination for patent filing compared to other jurisdictions, which are costly in their fee structure, but the patent is granted faster . However, in India the multiple hearings and long drawn process results in very high legal costs **Moreover, cost of hiring a private legal attorney remains a challenge for academic bodies specially the smaller institutes**
Cumbersome patent filing process	**Lack of Clarity on Required Documentation –** Even for basic patent examination the academia is dependent on the legal fraternity which in turn involves costs **Online filing is a challenge –** The patent process is not documented on the website, thus most of the academia fraternity needs external legal support, which again involves additional costs **Approvals from National Biodiversity Authority (NBA)** for biotech patents is a challenge which adds to further delays in the patent process
Lack of recognition of patents compared to publications	There is a lack of recognition of patents compared to research publications, this mindset needs to change across the academia fraternity, and patents should also be considered as credits in the academic research domain Awareness programs across academia to highlight the importance of IP creation
Lack of software patentability	Revisit the patent rules in India to incorporate patents on algorithmic contributions and ideas including software, this will encourage more patent filing which currently gets restricted to paper publications in many cases

Source: Primary Interviews and nasscom Analysis

Law Firms' And Start-ups' Challenges

Process hiccups, with start-ups also highlighting overall costs as an issue

		Supporting Arguments
Law Firms	**Operational/Technical challenges with the patent filing website/patent office**	**Website interface is not user friendly, there are issues on an ongoing basis** ▪ Uploading of documents is very slow on the website ▪ Payment process is inefficient and gets stuck on a regular basis, delaying the whole process. This is a major problem specifically incase of urgent filings and renewals The requirements for every document to be notarized and stamped also creates a time lag in the whole process. Some requirements have been rationalized but there is room to do more Lack of enough manpower and experts at the patent office compared to the rise of patents filed across newer technologies
	Lack of awareness on schemes	**Many start-ups and educational institutes remain unaware of the benefits** being offered **Filers especially academic institutes need to focus on quality of patents** and just not on the quantity of patents filed
Start-ups	**Operational/ Technical challenges with the patent filing website/ patent office**	**Website interface is not user friendly,** there are issues on an ongoing basis ▪ Specifically, the payment process is inefficient and does not work across browsers
	Cost is an issue	Considering the tedious process requirements, **start-ups are required to go through a legal attorney which increases the overall cost multiple folds, as high as 4X of patent filing fees** ▪ Lack of clarity in terms of document requirements is a key reason for using a legal attorney ▪ Most patent filing benefits are after the grant, which remains a challenge at the initial stages ▪ Need for simplifying the whole process which should have clearly documented requirements

Source: Primary Interviews and nasscom Analysis

Patent Creation Leaders Have Managed Some Of These Challenges

Best practices (1/2)

Organizations

Focus on creating a culture of innovation which has to be a continuous and evolving journey

- **Rewards and recognition for patent filing and grants** include organisation wide email in praise of the inventor to various financial incentives
- **Setting up of separate business** for the newly created patented solution and providing ESOPs to the inventor
- **Focus on building awareness of IP creation** as an important tool for innovation and growth through webinars, workshops and so on.
- **Common portals which provide details the whole patent process** making it easier for any employee to file a patent
- **Setting up of strong due diligence and governance process** for patent filing which is **supported by company's senior leadership**
- **Separate Research and Innovation team/Centre of Excellence** which encourages IP creation with customer and business growth as the key

Source: Primary Interviews and nasscom Analysis

Case Example

fractal

Focus on strict due diligence

- Strong process for identifying applications if they are worth filing, it is reflected in the company's 100% grant ratio in the US

Rewards and recognition goes forward to wealth creation

- At Fractal if there is an innovation which has a possibility of becoming a successful business, the organization supports the same by creating a business around it, incubates certain set of technologies and then go ahead and separate the business out of it and gives ESOP to the inventor

- Limited financial rewards for patents granted move to the next level of wealth creation for the inventor which is linked to the business created by his/her invention

Case Example

LTIMindtree

Recognition and knowledge sharing on internal engagement platform

- **Uses its internal social engagement platform Yammer (a microsoft product) as a key tool for sharing knowledge on patents**
  - The platform has different communities related to tech, processes, hobbies, etc. wherein people continue to get together and throw around ideas and encourage knowledge sharing to arrive at innovative solutions
  - On patents, it provides details of the whole patent filing process which provides all the required information for a new filer. It also recognises the patent wins on the platform and sends out emails across the organisation

Internal Patents Platform "Blue Book"

- Provides all information on patents that have been filed, details of the filer, grant details, status of the patent etc. Also, provides a clear workflow across different patent offices.

Complete Senior Leadership support on Innovation and IP creation

Mastek
Trust. Value. Velocity

Focus on IP Knowledge Building

- The focus is on building awareness across all stakeholders including developers, business leaders as well as customers on the importance of IP creation.
- Creating awareness on the value that IP creation can bring on is an important first step for going into patent management or IP creation at an organizational level

Creating the IP Support Ecosystem

- IP council with senior stakeholders from business, pre-sales as well as tech, together with access to IP lawyers for all the patent filing support
- Support for creating the IP document which is ready for filing, which makes it easy for anyone to file a patent
- Getting all the stakeholders together ensures that there is a 360-degree understanding across all stakeholders on all aspects
- With a set process and supporting ecosystem – IP filing becomes a habit

Source: LTI Mindtree and Mastek

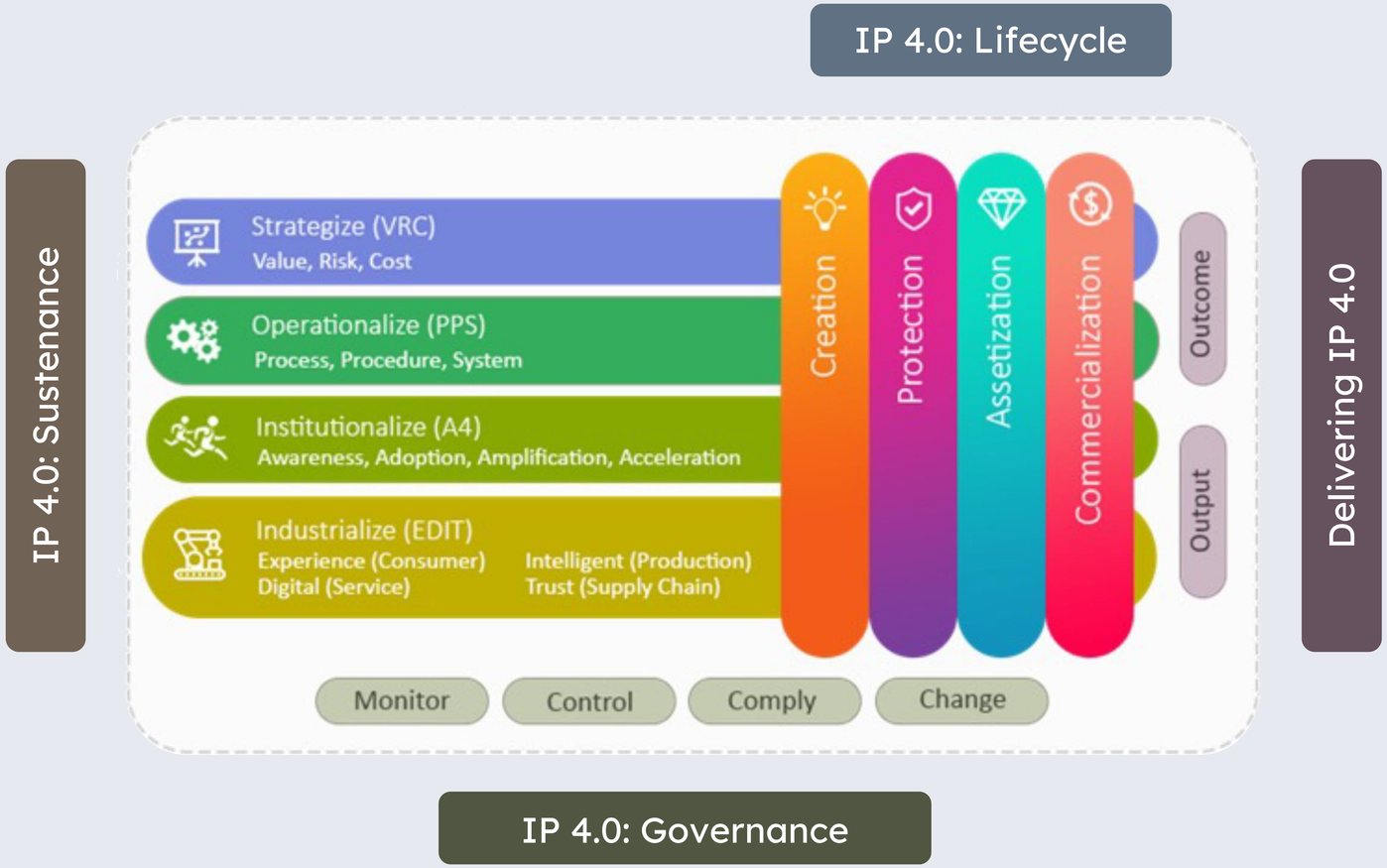
Case Example

IP Management @ TCS

TCS has established an industry leading IP management framework (IP 4.0) that helps in defining a roadmap for maturing the organization's focus on IP-led business growth.

This framework:

- Sets the foundation for institutionalization of frameworks, processes and procedures that address the risk of infringement of third-party IP while safeguarding TCS' own IP assets
- Enables the acceleration of 'technology and insight led' disruptions
- Propels growth-momentum through appropriate IP-led businesses by way of adopting new paradigms and models of innovation



Source: TCS

Leading Academia Patent Creators Have Managed Some Of These Challenges

Best practices (2/2)

Academia

Creation of an IP cell – which focuses on building a culture of IP creation across students as well as faculty members

- Works on due diligence for every patent filed – making sure it is patentable idea
- Creation of IP awareness through various programs and workshops
- Engagement with licensing partners and investors
- Forges industry collaborations and partnerships

Source: Primary Interviews and nasscom Analysis

Case Example

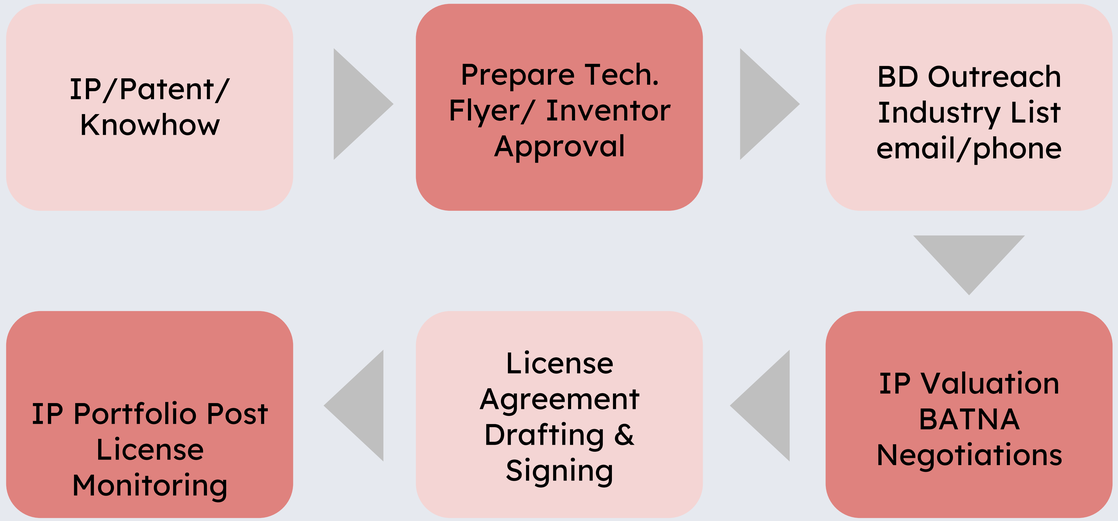
IC&SR, IIT Madras (1/2)

Focus on Industry Partnerships through IC&SR

- The Office of Industrial Consultancy and Sponsored Research was established at the institute in 1973
- Its broad objectives include to:
  - Facilitate and manage projects taken up by faculty
  - Link funding agencies with faculty, Maintain a repository of faculty expertise
  - Draft and manage MoUs / JDAs / NDAs and all legal agreements
  - Intellectual property management – filing of patents (national and international), following up on licensing
- It has a very transparent and open policy for industry outreach and joint IP creation, and facilitates all the needs of the faculty members with respect to industry collaboration
  - To ease the coordination a software TULA is deployed, which gives all the details of projects and accounts for each faculty member at just one click.
  - IC&SR offers multiple modes of engagement with the industry, and affords a great deal of flexibility in the arrangement.

Technology Transfer Office for Commercialisation of Patents

- The main objective of TTO office is to license IITM technologies to the industry
- The office follows a specific process to commercialize all IP's like patent, others



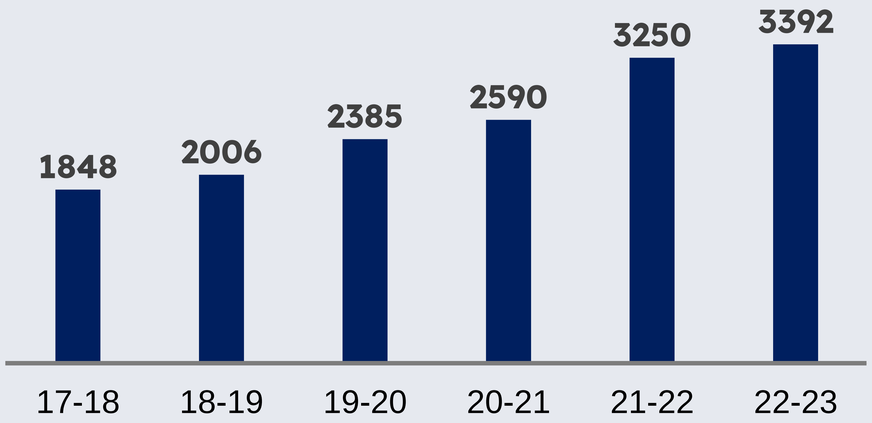
Source: IIT Madras

Case Example

IC&SR, IIT Madras (2/2)

- TTO is working on a database of patents which it plans to open for the industry to take it forward through various modes.

TTO Licensing Cumulative Earnings ₹ Lakhs



IP Awareness Programs

- Monthly awareness programs are conducted for faculty members in every department where the importance of IP and the objective of TTO is explained

Impact Created

1550+ Projects Ongoing

600+ Indian Company Partnerships

84+ Foreign Company Partnerships

200+ IP Annually Filed

Total Patents Filed as of Feb 2023:

- India – 1400+; Granted – 430+
- Outside India – 640+; Granted 160+

Source: IIT Madras

Case Example

IIT Kanpur

Senior Leadership Support through committees headed by Directorate IIT Kanpur

- **Intellectual Property Evaluation Committee:** Decides which application to file as patent
- **Tech Transfer, Equity Management and Advisory Committee:** Takes care of the valuation, terms and conditions for licensing of the technology or commercialization of the technology
- **The two committees decides and keep evolving the policy framework, and are also responsible for decision making and other operational issues**

IPR cell with a focus on commercialisation

- The IPR cell has the objective to protect the IP and to disseminate the technology
  - The main objective of the cell is not only to support patent fling, but to translate it to commercialisation stage.
  - Commercialisation could be for solving a social problem/social good or for revenue generation
- The cell reports to the two committees and has a representation in both the committees
- Every patent application goes through a strict internal due diligence through a five-point triage model which checks on:
  - Technology Readiness Level
  - Lifecycle of the Technology
  - Relevant Problem Statement
  - Commercial Scope in a Specific Jurisdiction
  - Inventor’s Objective

IP Portfolio as of March 31, 2022

1000+ IPRs filed

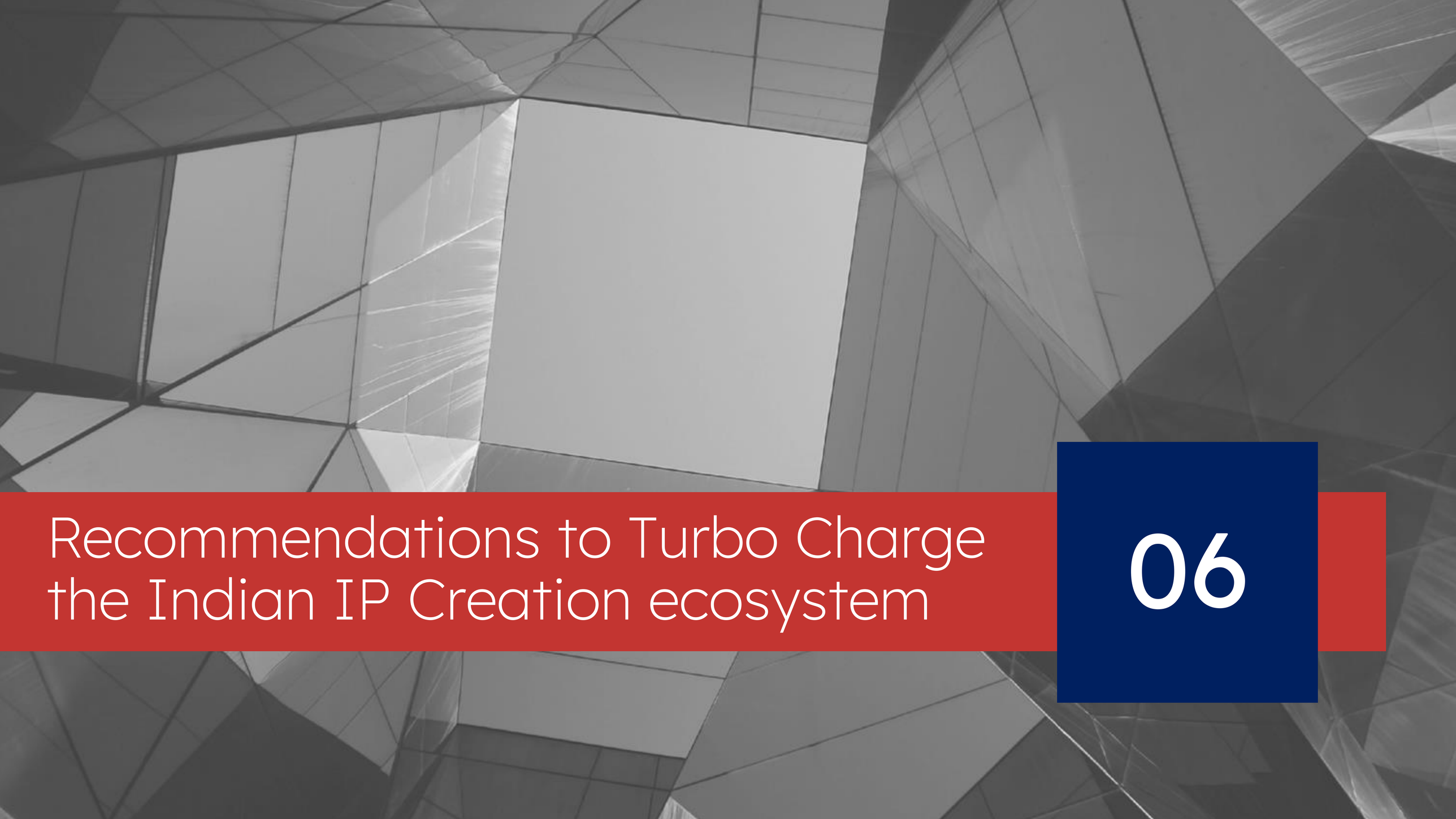
463 IPRs granted

269 filed and 112 granted to women inventors

Exceptional patent commercialisation ratio* of **13.4%**

*Commercialisation ratio refers to share of patent applications commercialised of all the patent applications filed

Source: IIT Kanpur



Recommendations to Turbo Charge the Indian IP Creation ecosystem

06

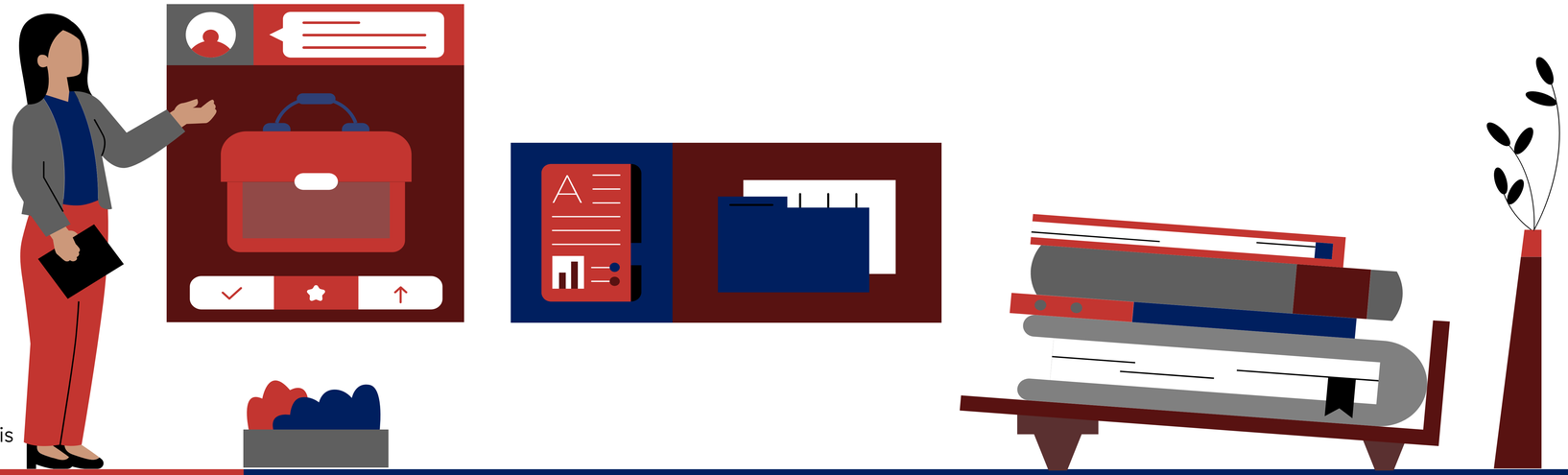
Recommendations To Turbocharge The Indian IP Creation Ecosystem (1/3)

Patent Office	Supporting Arguments
Need to work on timelines	▪ Work on pendency's of legacy cases – patents filed before 5 years or earlier ▪ Take sufficient time to grant with good well reasoned office actions ▪ Clear timelines for both applicants as well as examiners for each process/ office action to be decided and strictly followed
Expert examiners	▪ Regular trainings of examiners across new areas and technologies ▪ Hiring of new manpower/ experts as required to ensure quality and timeliness of patent grants ▪ Practical training for new patent agents about the process before they start advising on patent filing
Legal clauses	▪ **Pre-Grant Opposition –** To have cut off time limits for opposition as against the anytime before the grant procedure followed currently ▪ **Section 8 -** Since Patent Office can check the status of the patent in WIPO's DAS system as required; this section is not relevant, criminal sanctions and civil penalties attached to it should be reconsidered ▪ **Article 27 –** Relax the need for data specificity ▪ **Section 39 -** Compulsion to first file in India should be on case-to-case basis related to industry application of the patent ▪ **Decriminalization of certain patents related statutes** ▪ More clarity and specific guidelines with respect to technology patents ▪ Provide a **fast-track route to the industry** also which at times is a big business need. It could come at an extra fees which would be beneficial for both the organisation as well as the patent office ▪ **PHP with more countries** similar to the one with Japan, also work towards removing or extending the cap on the number of patents in the program ▪ Make the refund process for start-ups faster and easier. **Create more awareness across stakeholders regarding various incentives being provided** ▪ Promote IP based financing, which will drive more innovation in the country ▪ India Patent Office can set-up an IP exchange forum where IP buyers and sellers can meet

Source: Primary Interviews and nasscom Analysis

Recommendations To Turbocharge The Indian IP Creation Ecosystem (2/3)

Patent Office	Supporting Arguments
Patent filing on the website	▪ Should have a gamified version of the whole patent filing process, which even a student can understand – this will ensure ease of use to all applicants across segments ▪ The whole process needs to simplified and well documented so that even a non-legal person can file a patent online ▪ Interface needs to be user friendly and accessible across browsers ▪ Payment process needs to be made more efficient and faster
Support academic institutes and start-ups on patent filing	▪ Provide trainings across universities on filing of patents and ways to commercialize and monetize it ▪ A forum with attorneys/legal agents which assists universities, start-ups and smaller firms to file patents at a nominal cost or on a subscription model which is managed by the patent office ▪ Provide a basic level of incentives at the start of the patent filing process



Source: Primary Interviews and nasscom Analysis

Recommendations To Turbocharge The Indian IP Creation Ecosystem (3/3)

Industry

Support Patent Office in training examiners

Industry can play an important role in upgrading the knowledge of the patent examiners, as the change in technologies is happening at a very fast pace, which will become easier for the examiners to embrace with the support of industry

Legal Counsels

Need to upgrade their technology knowledge

Legal counsels need to work towards upgrading their knowledge across new technologies which would help them in drafting patent documents

nasscom

Work towards IP awareness and facilitate stakeholder collaborations

Work towards creating a forum across stakeholders

- Academia, industry, start-ups and even the legal fraternity
- Act as a ground for building co innovation through partnerships specially for academia to connect with licensees
- Overall pushing a culture across stakeholders to focus on IP creation, and share their learnings

Academia

Create more awareness with respect to IP creation among students and faculty

Focus on programs and workshops that raise awareness regarding IP creation and filing benefits they can be availed while filing in India

All Patent Filers

Focus on quality of patents filed and not quantity

Due diligence process to ensure that patents being filed are novel and solving a specific problem. Focus should shift from quantity to quality which would also facilitate a higher grant ratio

Source: Primary Interviews and nasscom Analysis

What to Expect in 2023 from the Indian IP Creation Ecosystem

07

The Road Ahead

Rise in IP awareness will drive domestic patent filing

- Various efforts by the patent office and government to create IP awareness will provide further boost to domestic patent filing
- Awareness initiatives coupled with various incentives for educational institutes and MSMEs will result in a rise in patent filings among niche and smaller companies

Partnerships across stakeholders will strengthen IP creation

Partnerships across various stakeholders will play a significant role in IP creation with more innovation coming from:

- Industry and academia
- Industry and start-ups
- Start-ups incubated at academic institutions

Technology patents will maintain an uptrend

- Share of emerging technology use-cases will increase further
- Key Technologies that will be in focus:
  - **AI and ML -** Applications across industries and use cases will evolve with cognitive machine learning, generative AI and responsible AI in focus
  - **5G and 6G** will continue to gain importance
  - **IoT, Quantum, Metaverse, Image Analytics, Green Hydrogen, Additive Manufacturing, Robotics,** are the other key technologies which will see a lot of uptake

Source: Primary Interviews and nasscom Analysis

Appendix

08

Authors

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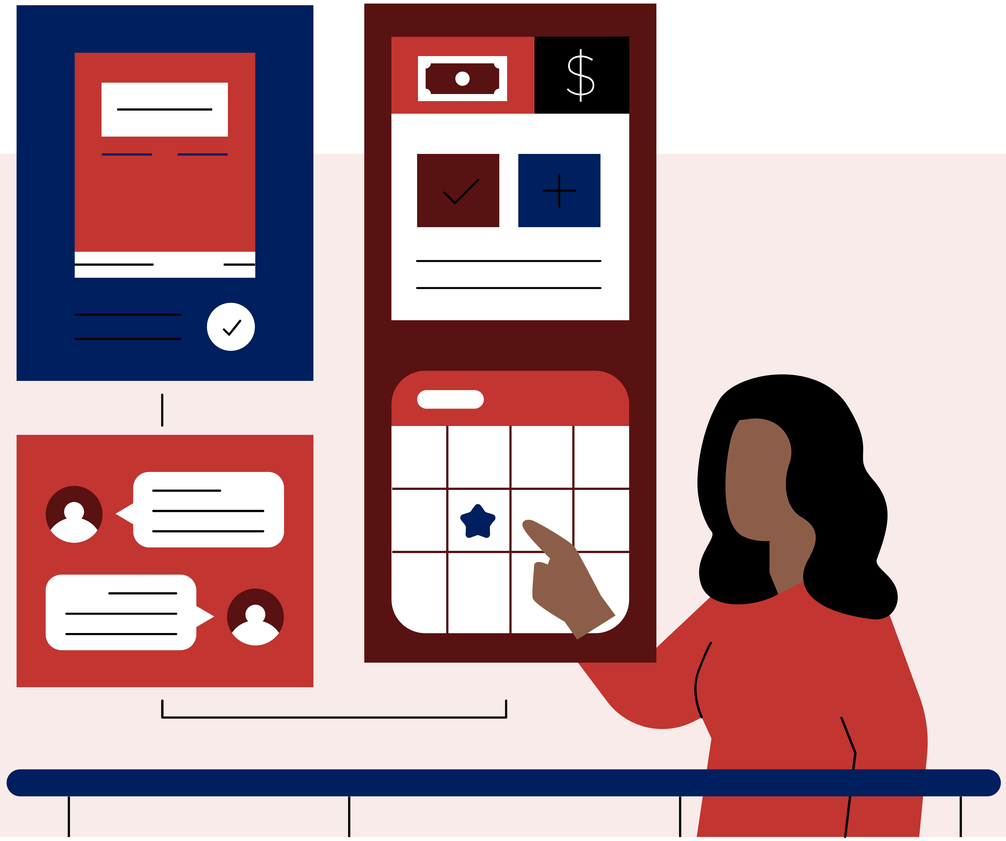

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