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Opportunities and Challenges in for Indian Academia for Standards

AN INDIAN PERSPECTIVE

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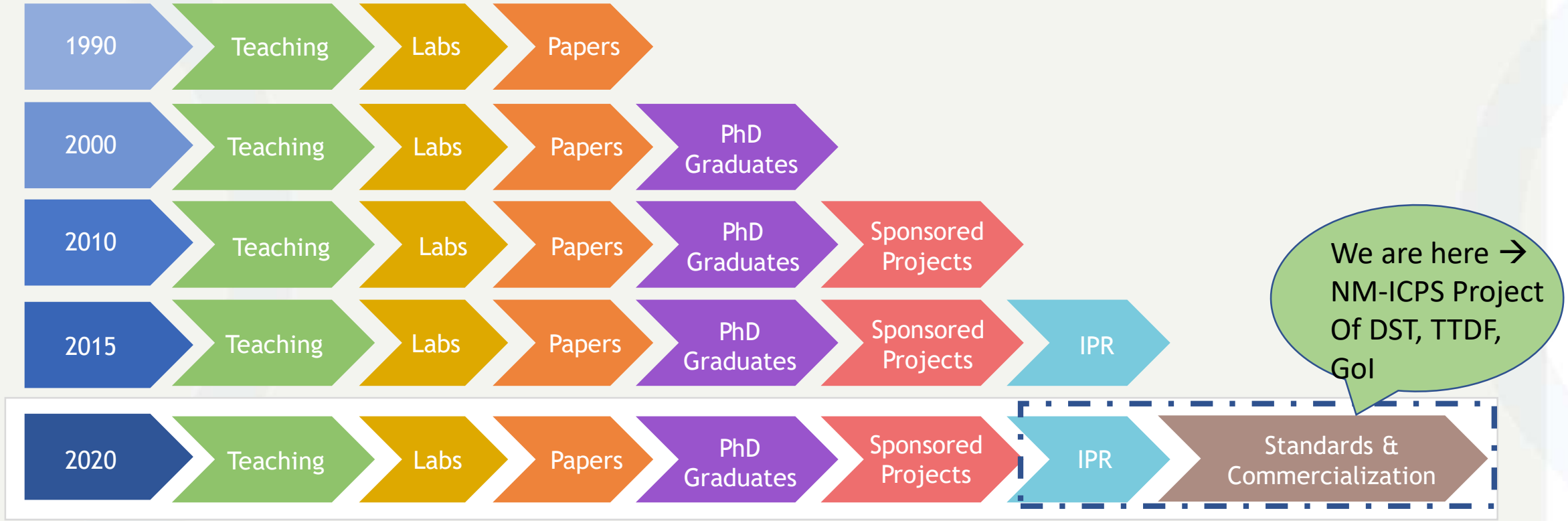
Agenda

- Indian academia scenario in R&D
- How we made a product R&D successful in academia: MOSIP
- The way forward for Indian academia: IPR and Commercialization
- Technology Readiness Level (TRL) → Funding for R&D in different levels
- Challenges and Opportunities → Capacity building

Indian academia scenario and expectations?

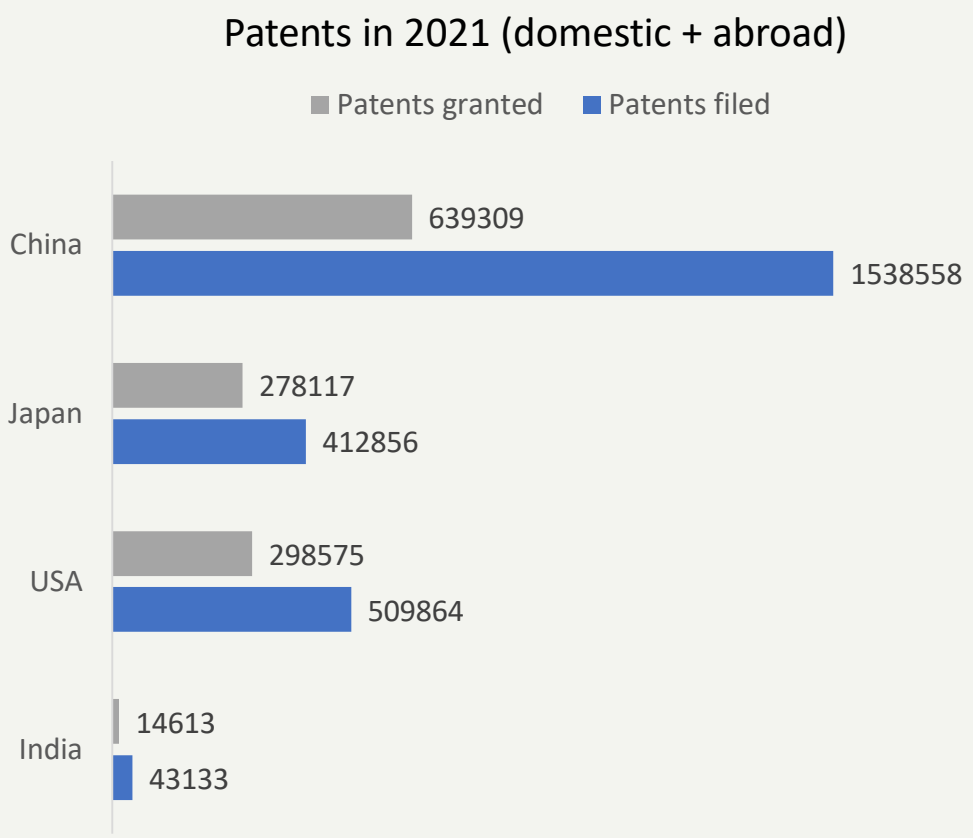


What do we do next in 5-10 Years?

Atmanirbhar Bharat

Indian academia scenario in R&D

- Not all PoCs are patented by Indian academia
- What is a patent and why is it important?
  - A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem
- All our papers offer new technical solutions to a problem – Why should we stop there?
- On the right: Number of patents filed and granted in 2021 by India, USA, Japan, and China



Source: World Intellectual Property Organization (WIPO; accessed January 31, 2023)

Indian academia scenario in R&D

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- Over the years the focus of Indian academia has been on:
  - Education: Producing highly skilled engineers
  - Research: Producing high quality researchers
  - Publications: Producing highly cited peer-reviewed papers

- The support for academia from funding agencies (other than industry) has also focussed on the same three points above
- In short, most of academia colleagues heavily focussed on the *R* and not much on the ***D* of industry level** of R&D
  - Building a Proof of Concept (PoC) is a good start
  - **But a PoC is not a commercial product**

How we made a R&D Product successfully from Academia to World (10+ Countries adopted)?

Sharing our experiences!

Rail of Digital Governance & Finance → Aadhaar

Functions of Aadhaar

- 2007-08: excellent technology of the time and proven
- Scalable technology architecture
- Application runs over Aadhaar → Authentication for Governance and Corporates
- One Individual – One Aadhaar (Unique ID number)

- Aadhaar: is not an Open Source, closed technology
- **2 Billion people NO ID + 1 Billion no proper ID = 3B**
- 60 Countries tried and failed to make Digital ID with biometric due to locked-in to a vendor or OEM
- Huge demand for a digital ID + Digital Public Infrastructure → for transparency and governance

MOSIP: Modular Open Source Identity Platform

Functions of MOSIP

- **Open Source: Started in August 2018**
- **Modular**
- **Vendor Neutral**
- **Configurable**
- **Secured and Privacy by Design**
- **Inclusive**

Supported by

BILL & MELINDA GATES foundation

Norad

Pratiksha Trust

TATA TRUSTS

MOSIP in Countries: IIIT-Bangalore has Signed 21 MoU for National ID and Sandbox testing

Morocco*

37 million

Philippines*

110 million

Guinea

13 million

Sri Lanka

22 million

Ethiopia*

115 million

Togo*

8 million

Sierra Leone

8 million

Burkina Faso

22 million

Madagascar

27 million

Niger

25 million

What Made MOSIP Successful?

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Governance and Transparency

- **Executive Committee (EC):** Director of IIITB is Chair, Funding agency and eminent people are members
- EC looks after policy and finance
- Donors have given USD$ 40 Million X 8Cr = Rs320 Crores and very positive with output
- EC does not interfere with Technical Committee
- Being in Academic institute and neutral environment → countries feel comfortable
- **Free of cost platform, training** to countries
- Data stays inside the respective country
- IIITB gives the MOSIP ID platform, but does not take part on System integrator or biometric device selection
- Anyone from MOSIP team can meet me and President of project any day/time
- Follow all best financial governance

Technical Features

- Modular architecture and 15 lakhs line of code
- Around 50 Design and developers work + 2 lawyers + 4 business developer + MOSIP Experience centre → All get market value salary
- Due to open source and modular → flexible and scalable in architecture
- Secured and Privacy taken care in design
- 80+ bio-metric companies + 10 system integrator of the world have declared MOSIP compatible
- Academic collaboration between IIIT Bangalore + CMU (USA-Africa) + Turing University (UK) + other universities
- We are now working with UIDAI/Aadhaar and MEA
- In March we will announce another big project linking to MOSIP on Global Digital Public Infrastructure (G-DPI)

First Digital Economy Working Group (DEWG) meeting | 14 Feb 2023 | Lucknow, Uttar Pradesh

Dr. Amitabh Kant, G20 Sherpa, India. Former CEO, NITIAayog (120 Millions now)

77th Session of the United Nations General Assembly: The Future of Digital Cooperation |Sept 2022 | New York, US

Mr. Bill Gates, Co-chair of the Bill & Melinda Gates Foundation

How to go forward with respect to Research → IPR → Standards → Commercialization in Communication Areas?

One need to decide → where he wants to be in TRL?

Technology Readiness Level (TRL)

RESEARCH

TRL 1

- Basic principles observed and reported
- Scientific research is just beginning

TRL 2

- Technology concept and/or application formulated
- Technology is speculative as there is no experimental PoC yet

TRL 3

- Analytical and experimental critical function and/or characteristic PoC
- Active research and design begin; technology viability becomes apparent

We seem to stop here most of the time!

Funding around 20 Lakhs to 1 Crore – SERB, DST, MeitY, CSR etc.

Technology Readiness Level (TRL)

DEVELOPMENT

TRL 4

- Technology validated in lab
- Multiple component pieces are tested with one another

TRL 5

- Technology validated in relevant environment
- More rigorous testing in realistic conditions

TRL 6

- Technology demonstrated in relevant environment
- Technology now has a fully functional prototype or representation model

Around 1Cr to 50 Cr – MeitY, TTDF, Private funding

Technology Readiness Level (TRL)

DEPLOYMENT

TRL 7	• System prototype demonstration in operational environment
TRL 8	• System complete and qualified • Ready for final implementation
TRL 9	• Actual system proven in operational environment

50 Cr to 200+ Cr – NMICPS, TTDF, MoD, Private

Main Challenges: Capacity building and Funding

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- **We need niche areas manpower:** first to push technologies from TRL 3 to TRL 6 and then till TRL 9
  - First step: business plan + manpower building → **need 5 to 10 years focused road map**
- To move towards this, DST has created the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) and DoT TTDF funds → 25 Technology Innovation Hubs (TIHs) established across India by NM-ICPS
- We need good people in team for Business development (Customer Centric), lawyers, Marketing and sales
- We need to collaborate with complementary groups from academia and industry for a product(s)
- Trust building: IPR and finance issues
- **Networking and Communication Community has very interesting, challenging and bright future with multiple options**
- IIIT Bangalore is hosting a TIH on **Advanced Communication Systems**
  - IIITB COMET Foundation
  - We are focussing on building an Open-RAN compliant 5G-Advanced Base Station and Reconfigurable Intelligent Surfaces

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Thank you!

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