



सत्यमेव जयते

Government of India

Ministry of Science & Technology

Department of Scientific & Industrial Research



**National Research
Development
Corporation**

Strategies of Effective Technology Licensing

International Workshop
on

“Supporting Innovative Entrepreneurs and Role of
Technology Transfer”

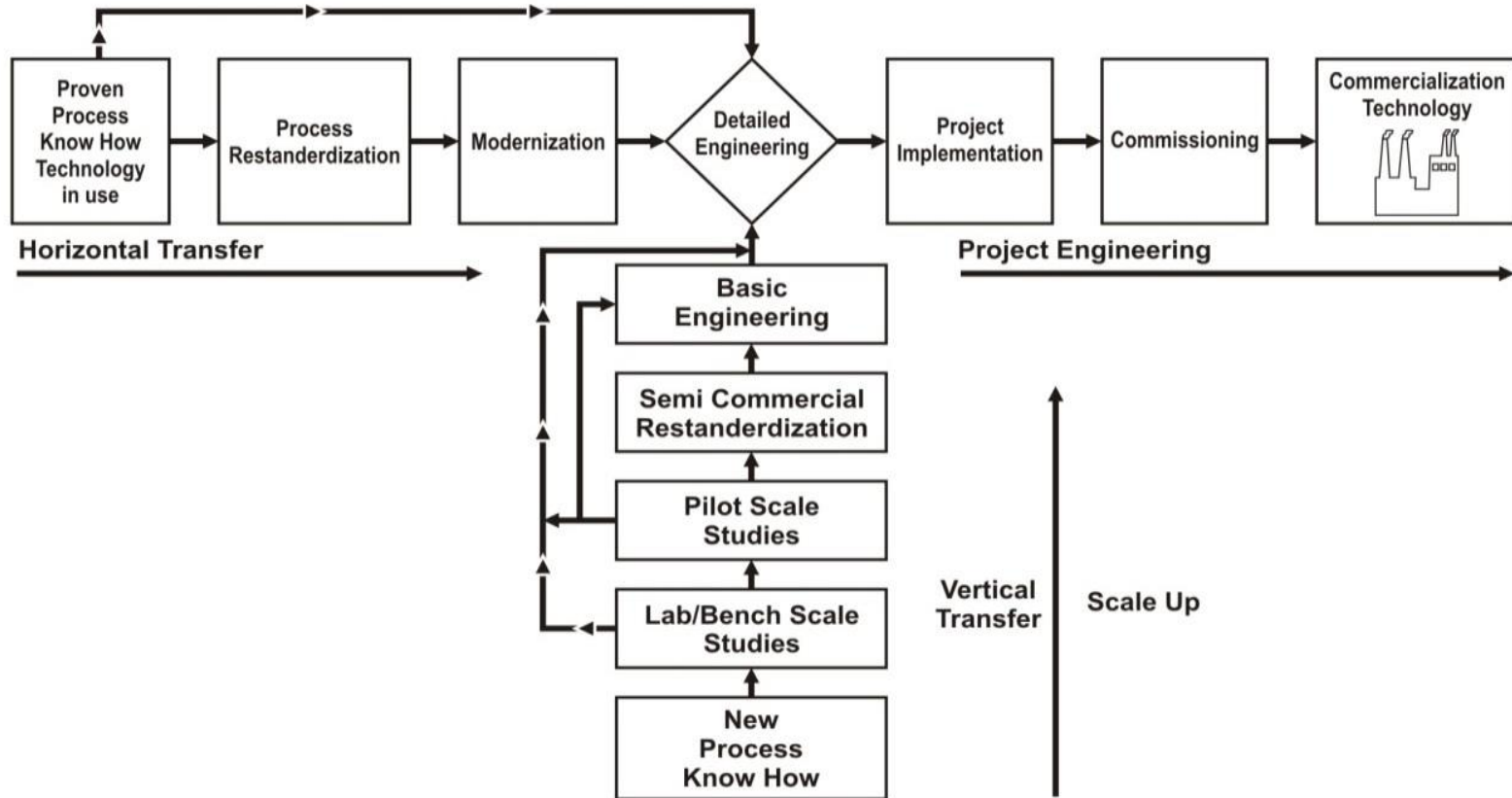
10 September 2017, Hotel Gateway, Vishakhapatnam

Dr H Purushotham
Chairman & Managing Director, NRDC

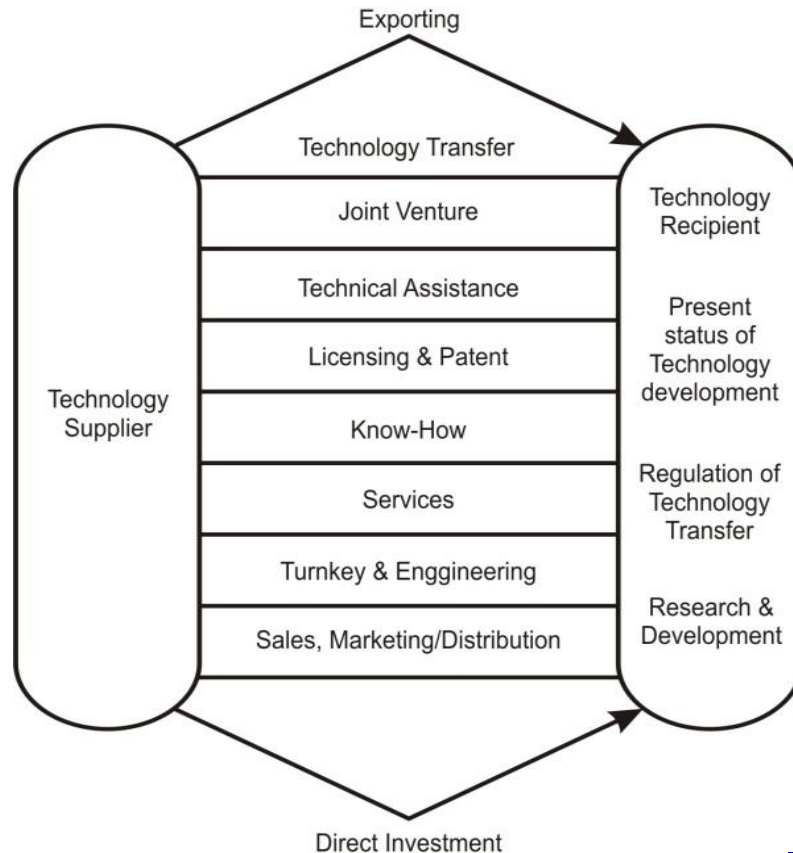
STRUCTURE OF PRESENTATION

- **Different Strategies & Models for Effective Technology Licensing**
- **How NRDC is Facilitating Successful Technology Commercialisation**
- **Summary & Conclusion**

DIFFERENT ROUTES FOR TECHNOLOGY TRANSFER



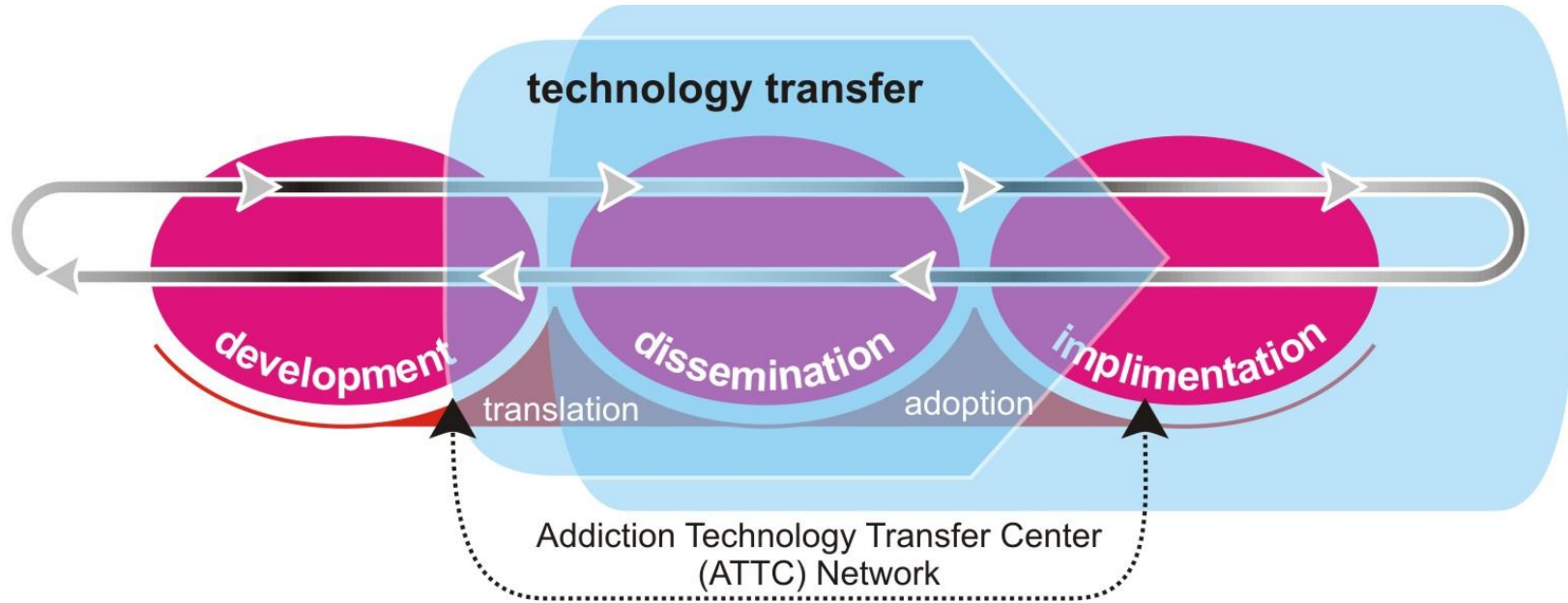
DIFFERENT STRATEGIES FOR TECHNOLOGY LICENSING



STRATEGIES FOR TECHNOLOGY TRANSFER/COMMERCIALISATION

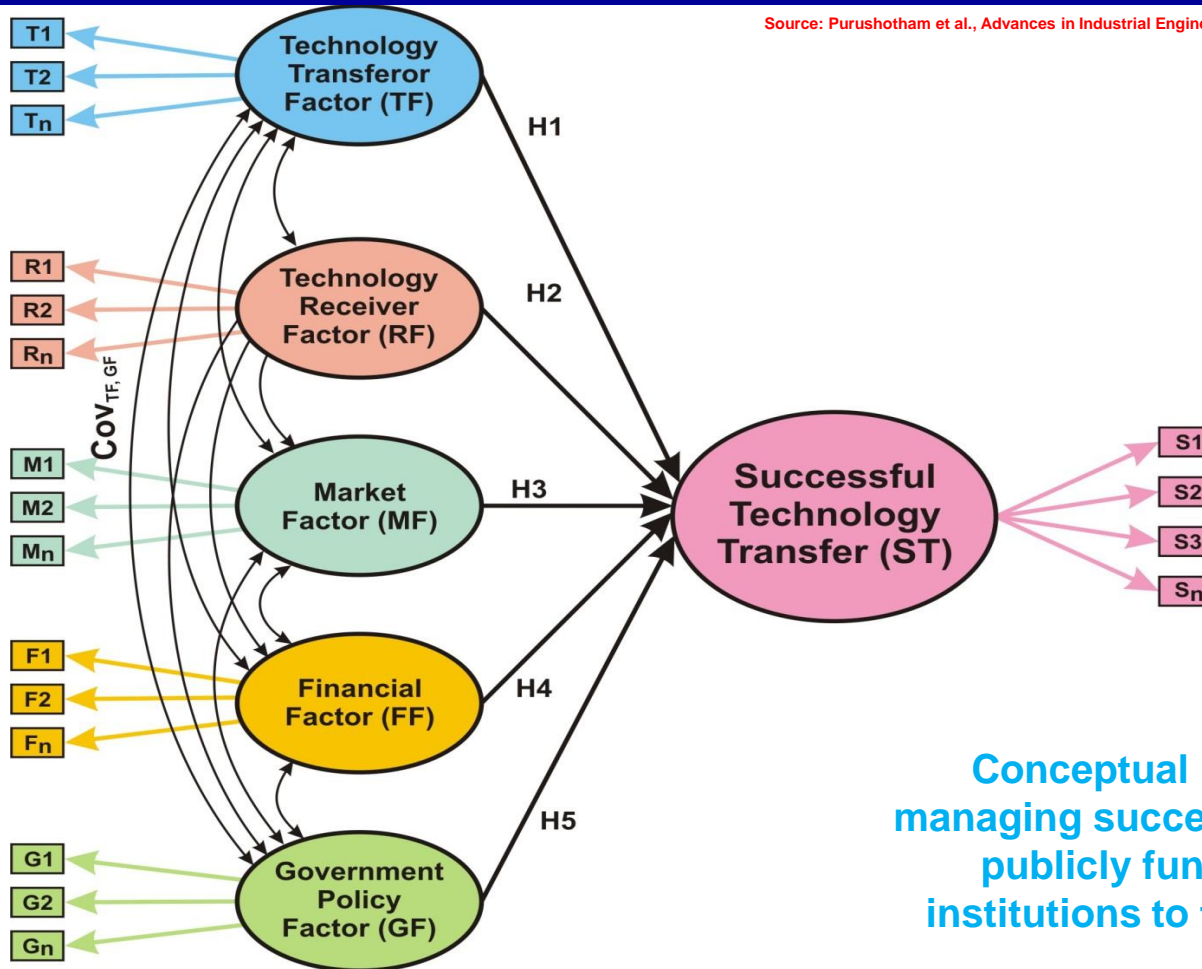
Model	Generation	Characteristic
Technology Push	First	Simple linear sequential process. Emphasis on R&D and science. Innovation is pushed by technology and science.
Market Pull	Second	Simple linear sequential process. Emphasis on marketing. Innovation is pulled by market needs.
Coupling Model	Third	Recognizes interaction between different elements and feedback loops between them. Innovation is a result of simultaneous coupling of knowledge within all three functions: R&D, manufacturing and marketing.
Interactive Model	Fourth	Combination of push and pull models, integration within firm. Innovation process is viewed as parallel activities across organizational functions.
Network Model	Fifth	Recognizes influence of external environment and the effective communication with external environment. Innovation happens within a network of internal and external stakeholders
Open Innovation	Sixth	Innovation processes does not take place only within the firm boundaries. Internal and external ideas as well as internal and external paths to market can be combined to advance the development of new technologies or introduction of innovative products, services and processes.

ATTC TECHNOLOGY TRANSFER MODEL (HEATHER, 2011)



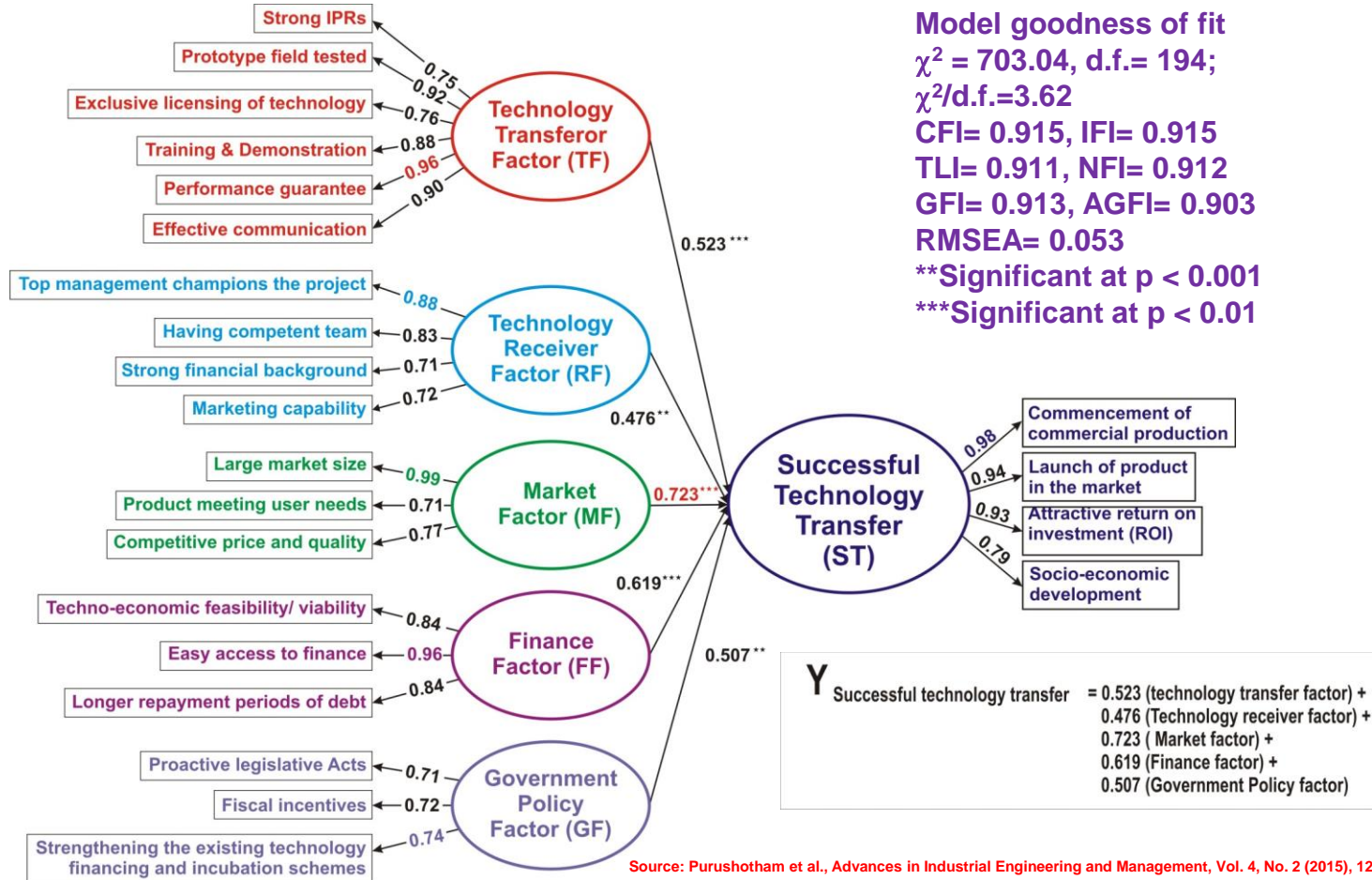
STRUCTURAL EQUATION MODELING (SEM)

Source: Purushotham et al., *Advances in Industrial Engineering and Management*, Vol. 4, No. 2 (2015), 123-146



Conceptual model for
managing successful TT from
publicly funded R&D
institutions to the industry

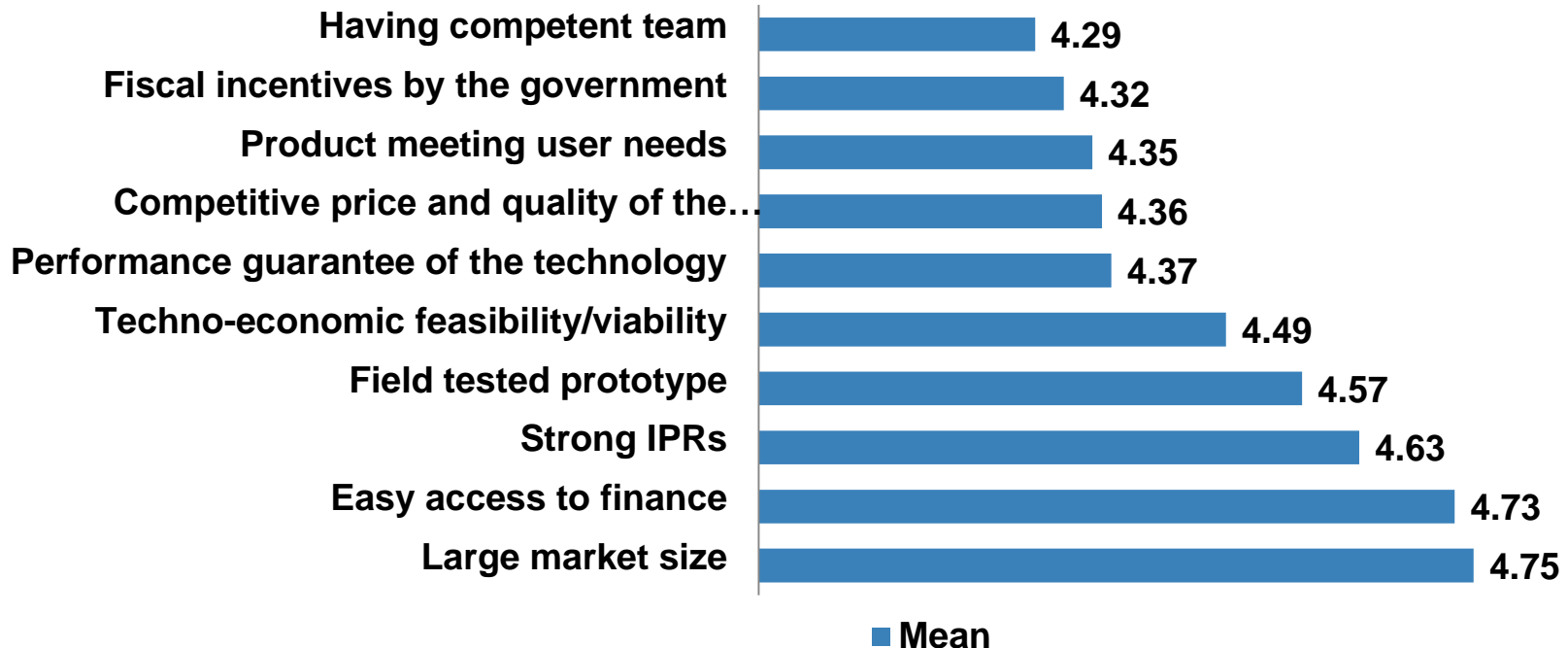
MODELLING OF SUCESSFUL TECHNOLOGY TRANSFER PROCESS



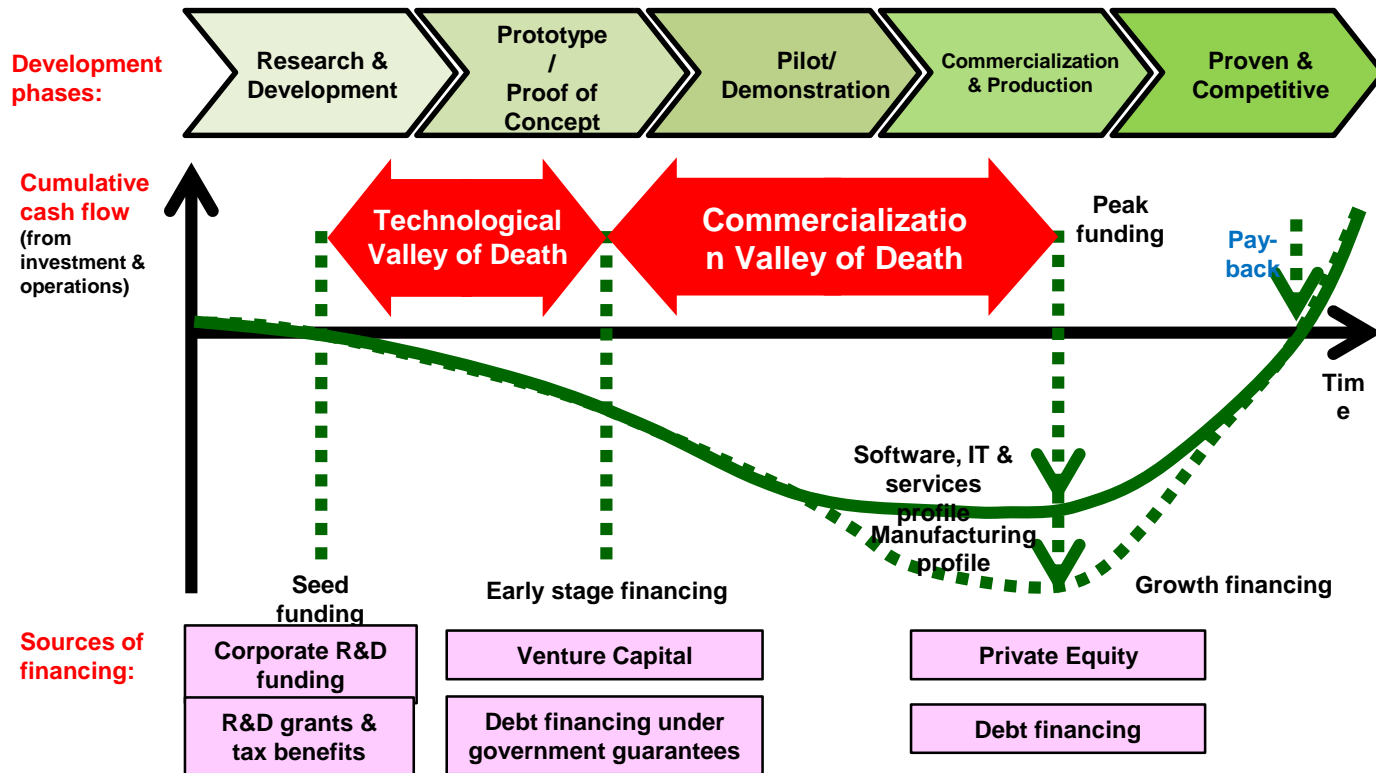
CRITICAL SUCCESS FACTORS FOR TECHNOLOGY COMMERCIALISATION

- **10 critical variables or conditions that need to be met minimum and managed to achieve successful technology commercialisation. They are:**

Purushotham et al., Advances in Industrial Engineering and Management, Vol. 4, No. 2 (2015), 123-146



CROSSING THE “VALLEY OF DEATH” IN TAKING TECHNOLOGY TO MARKET PLACE



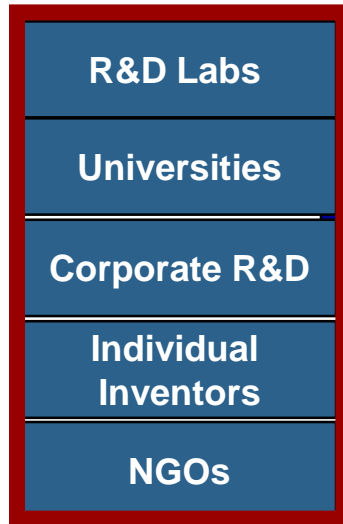
NRDC STRATEGY FOR COMMERCIALISATION OF TECHNOLOGIES



LARGEST TECHNOLOGY TRANSFER ORGANISATION IN INDIA

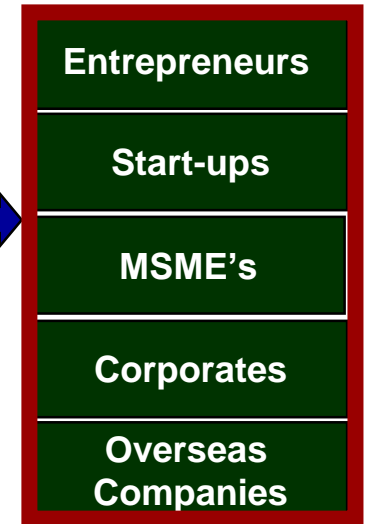
Licensed over 4900 Technologies

- Technology Evaluation
- Pilot Plant Studies
- IPR Protection & Management
- Prototype Development
- Field Testing
- Market research
TEFR/DPR/BEDP



NRDC
A House of Technology Transfer- 2500 Technologies

- Regulatory Approvals
- Marketing
- Seed Funding
- Skill Development
- Start-up India
- Incubation Services
- National Awards
- Licensing & Royalty Collection



All Areas
of S&T

4900
Technologies
Licensed

1700 Patents
Filed

500 MoUs in
Force



Make in India

Designed to facilitate investment, foster innovation, protect IP and build best-in-class manufacturing infrastructure.



Start-up India

To create a single point of contact for the entire Startup ecosystem and enable knowledge exchange and access to funding



Digital India

Transform India into a digitally empowered society and knowledge economy

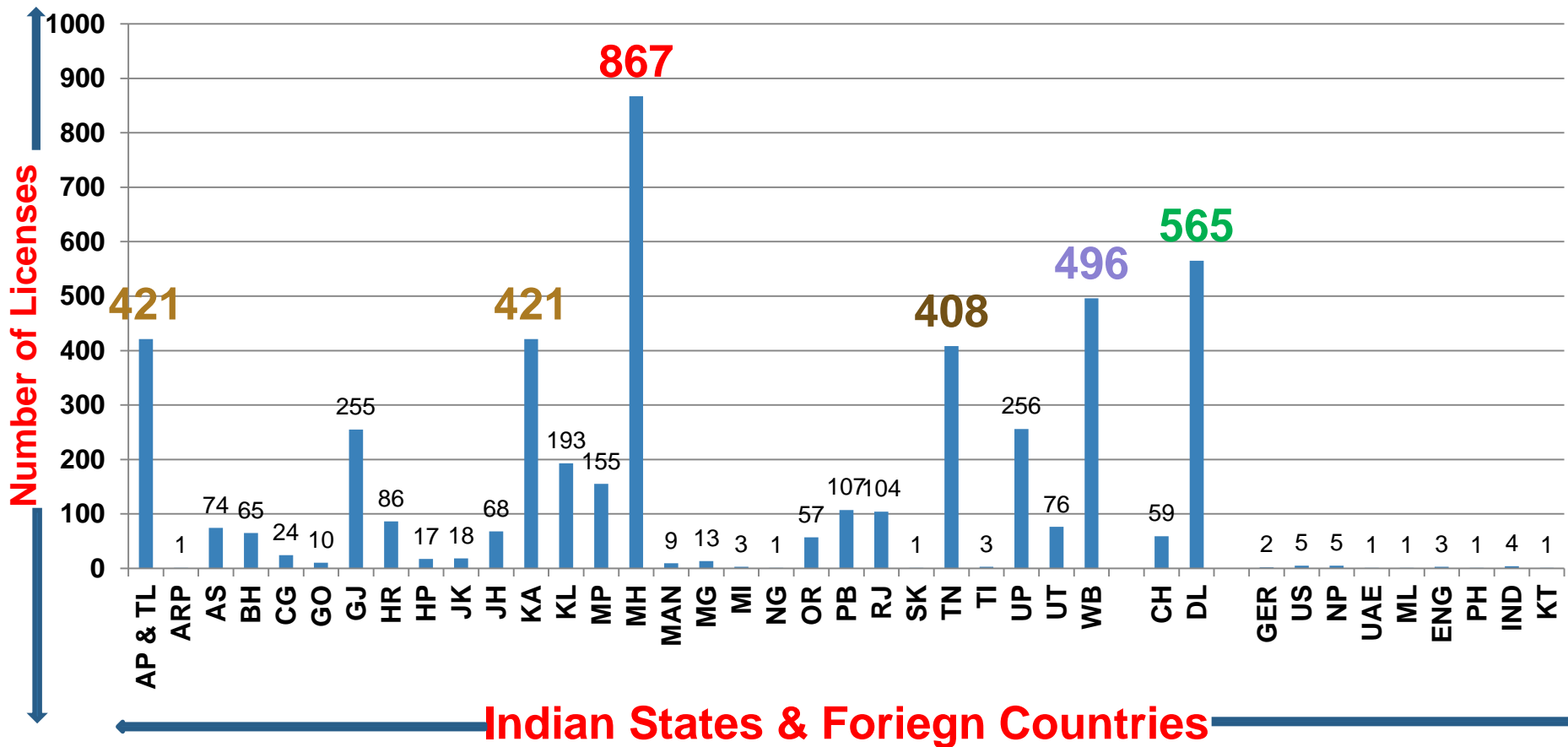


Skill India

Aims at providing training and skill development to 500 million youths by 2020

FLAGSHIP PROGRAMS OF GOVERNMENT OF INDIA

Licensing of technologies/Innovations by NRDC to Start-ups/SME's in India & Abroad





NRDC - TRANSFERRED TECHNOLOGIES TO 24 NATIONS ACROSS THE GLOBE

OUR SOURCES OF TECHNOLOGIES

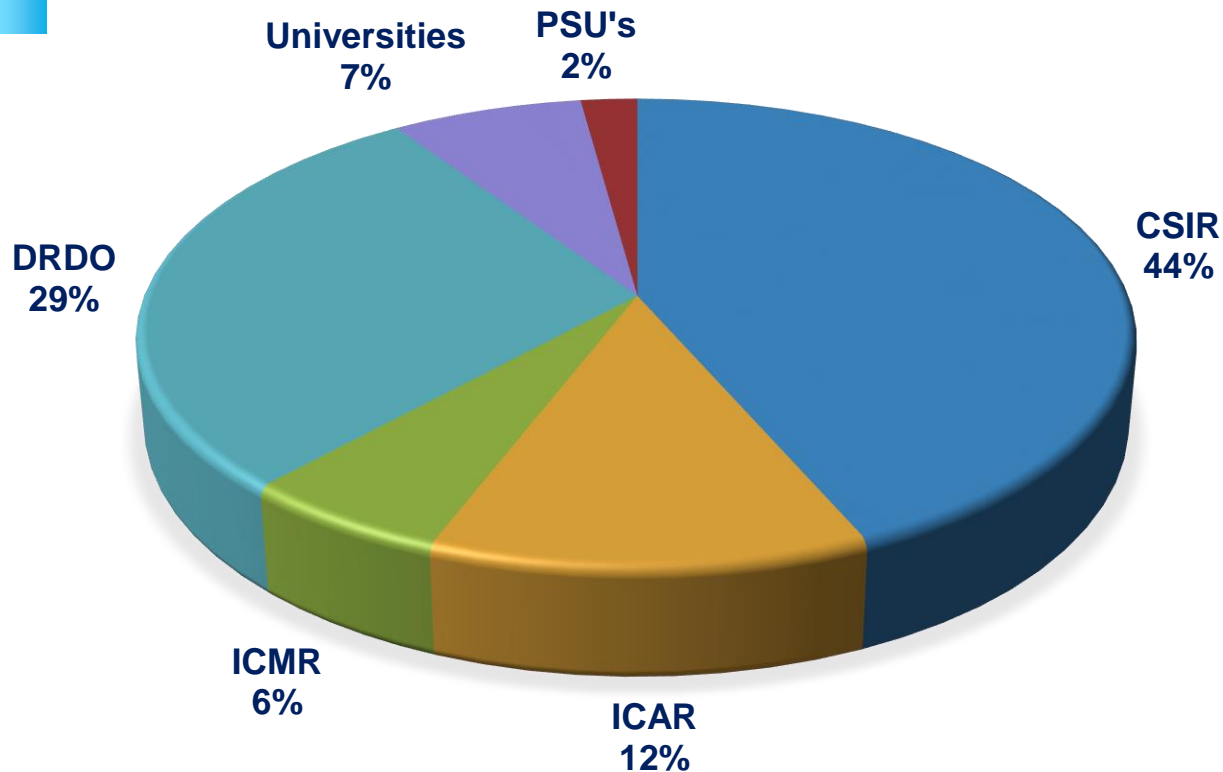
CSIR – Council of Scientific and Industrial Research

DRDO – Defence Research Development Organisation

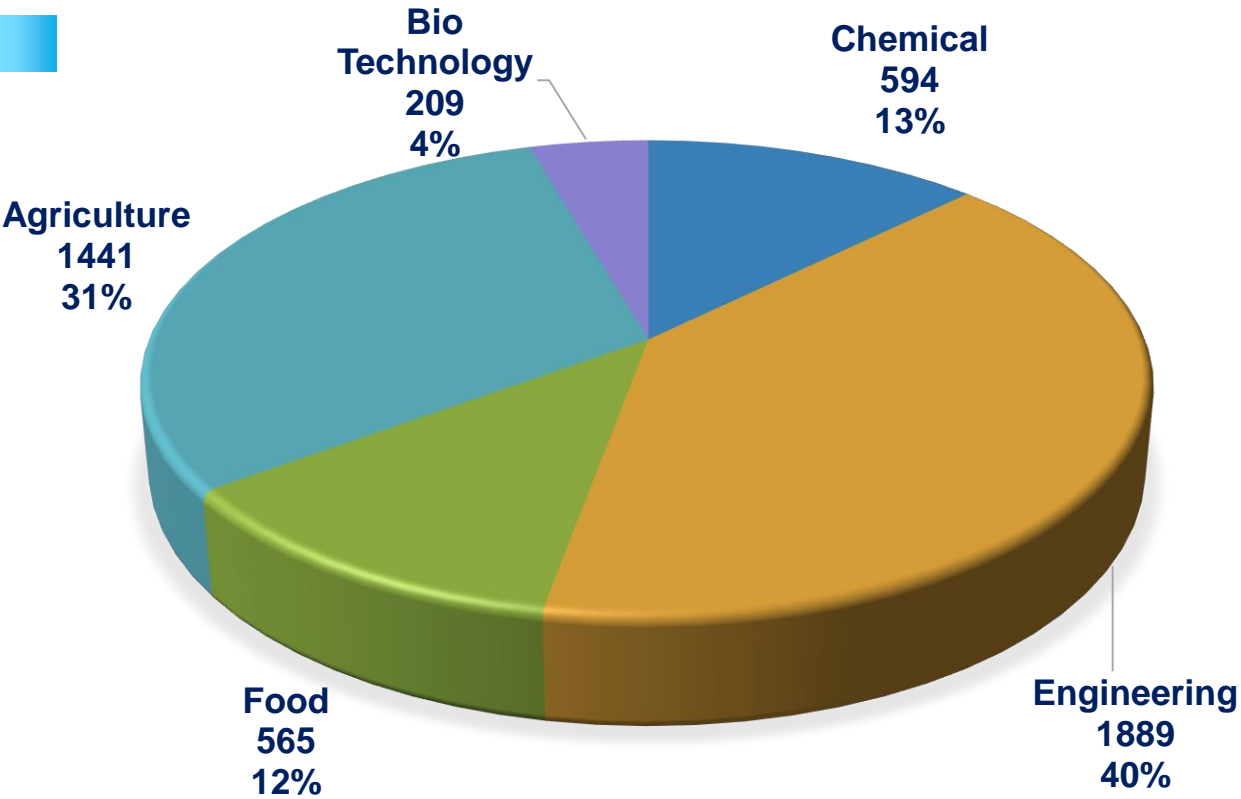
ICMR – Indian Council for Medical Research

ICAR – Indian Council for Agriculture Research

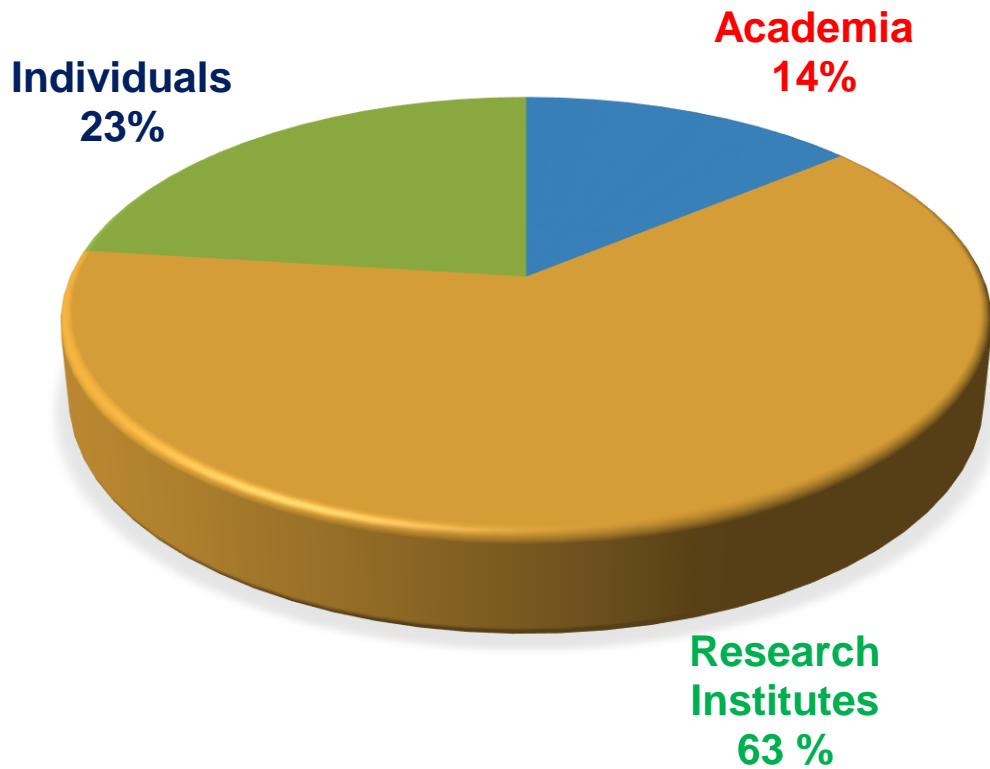
PSU – Public Sector Undertakings



SECTOR WISE LICENSING OF TECHNOLOGIES



PATENTS FACILITATED – OVER 1700



NRDC AWARDS TO MERITORIOUS INVENTIONS & INNOVATORS



NRDC Innovation Award

- IP Driven Innovation
- Innovation in high tech area
- Cash award of Rs 5 lakh each
- Number of Awards: 2

NRDC Societal Innovation Award

- Agriculture, Environment
- Rural, Energy
- Cash award of Rs.3 lakhs each
- Number of Awards: 3

NRDC Budding Innovators Award

- Students
- Cash award of Rs 1 lakh each
- Number of Awards: 5

Total number of Awards conferred till 2013 are 935 Numbers

NRDC TECHNOLOGY COMMERCIALISATION SUCCESS STORIES

Infant Food

20 HP Tractor

Indelible Ink for Election Purpose

Artificial Heart Valve

Mini Cement Plant

Disposable Blood Bag System

Spirulina Algae

Water Filter Candles

Glucose Bio-Sensor

Vijetha (Silkworm bed
disinfectant)

Superabsorbent Hydrogel

Extraction of Azadirachtin
and formulation

Potassium Humate

Ayush 82 – Anti Diabetic
Herbal Formulation

Monocrotophos

Invert Sugar



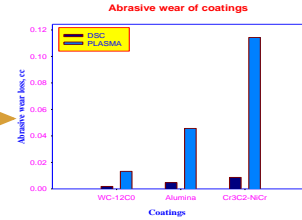
A CASE STUDY ON SUCESSFUL COMMERCIALISATION OF DSC TECHNOLOGY



Agreement with collaborator



Get a Demo Unit



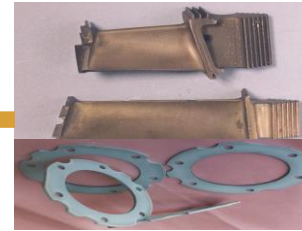
R&D to optimize coatings



Business Workshop



Indigenous fabrication



Job Works



Agreement with technology receiver



Helping technology receiver in establishing the jobshop



Technology inauguration



Typical Applications Developed



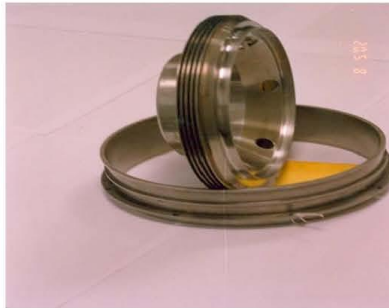
Valve Spindles



Shaft Seal Drum



Wire Guide Rollers



Aero-engine Components



Guide Vane



Sleeves

CONCLUSION



- India's No. 1 Technology Transfer Organisations with over **6 Decades of Experience**
- Effectively managing **Tech Databank of over 2500 Technologies**
- Transferred over **4900 technologies** and filed **over 1700 Patents**
- Exported technologies and services to **24 Countries**
- After India **NRDC** has Large Presence in **AFRICA**
- Created Wealth of over **30 Billion** Indian Rupees and Generated **Employment for over 100 Thousand** personnel in last 10 years.
- **Ploughed back over 1 Billion** Indian Rupees to Technology Generators

Innovation/IPR : Key for Prosperity



"IPR"



Act as Catalyst



Thank You

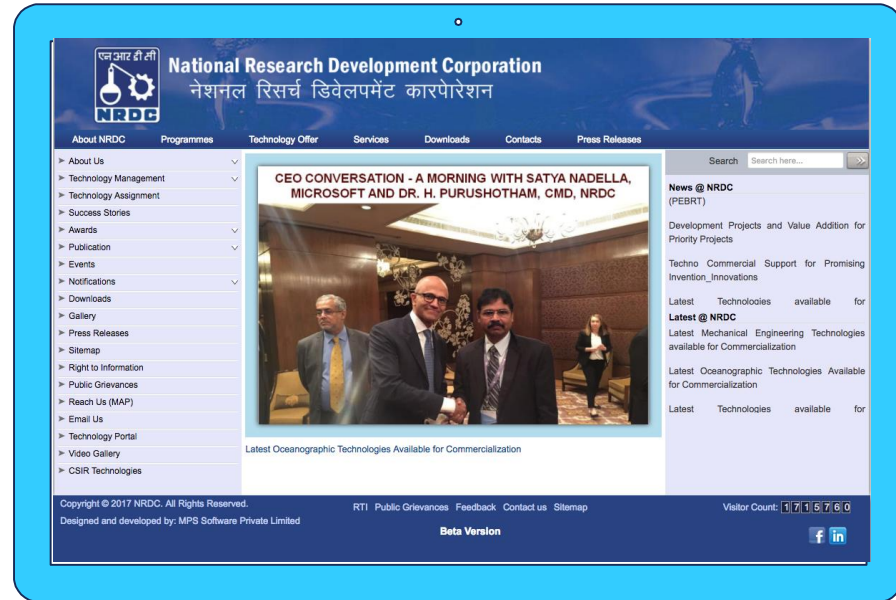
Any Questions?

You can find us at

→ nrdcindia.com

→ cmdnrdc@nrdc.in

→ [@nrdcindia1953](https://twitter.com/nrdcindia1953) 



**LOOK FORWARD FOR
PARTNERSHIPS IN IP & TECHNOLOGY COMMERCIALIZATION**