

Profile

NAME

Dr. Sanjay Bhardwaj



DESIGNATION

Scientist "F" and Head

QUALIFICATION

Ph.D. obtained at: IIT Bombay, Mumbai

Doctoral thesis title: "Developing a Commercialization Model for the Advanced Materials Technology Sector in the Indian Context"

Highly Commended Winner in the Emerald / EFMD Outstanding Doctoral Research Awards, sponsored by International Journal of Operations & Production Management (IJOPM) – a top ranked and official journal of the European Operations Management Association



Emerald/EFMD Outstanding
Doctoral Research Awards
**Highly Commended
Award 2015**

EXPERIENCE

- Over 24 years' experience in different facets associated with commercialization of R & D results, application development, process engineering and production planning. Typical areas include
 - Intellectual Property Development Indices (IPDI)-based Collaborative and Technology Transfer Models (ICTTM), derived from Doctoral research work, have been methodologically implemented at ARCI to boost translational research culture. This mainly included: (i) assessing the

readiness level of R & D, (ii) identification of value addition activities for translation of research to transferable technologies, and (iii) creating collaborative / technology transfer models for envisaged partnership situations for identified value addition needs. This initiative towards 'maximizing the utilization of ARCI knowledge-base and research capability' has played key role in significant growth in (a) the 'number of innovation-based collaborations and technology transfers' and (b) also the 'number of leads exploring the possibility of partnerships / technology transfers'

- Working with R & D teams and external stakeholders to develop/implement the strategies for commercialization of R & D results
- Negotiating/finalizing Agreements to forge partnerships for collaborative R & D, sponsored R & D, commercialization option and technology transfers
- Designing/implementing outreach programmes for novel technologies and technology-based-products, performing techno-commercial feasibility analysis for technologies being developed/demonstrated
- Conducting patent/competition analysis, valuation of technologies and technology-based-products
- Application development, production planning, process engineering
- Received IICChE – ICI India Ltd. Award 2018. The award recognized significant success in developing an innovative model to translate scientific knowledge into industrial/commercial applications for wider social relevance. **Work includes ICTTM and associated concepts useful for R & D / intellectual capital commercialization**
- Has been involved in forging collaborations / technology transfers for ARCI's materials-based-technologies with several organizations, including start-ups/established companies. Negotiated / finalized nearly 200 Agreements for technology transfer, technology development and demonstration, collaborative R & D, contract / sponsored R & D, commercialization option, technical services, and material transfer
- Led Project - Centre for Knowledge Management of Nanoscience & Technology (CKMNT) supported by National Nano Mission (Department of Science & Technology, Government of India) from January 2015 to September 2016
- Took initiatives, which culminated in signing of the first international Technology Transfer Agreement of ARCI with a Singapore-based company
- Guidance to postgraduate students for their internship projects

RESEARCH AREAS OF INTEREST

Research Collaborations, Strategic Technological Alliances, Technology Commercialization Process, Technology Marketing and Transfer, Science & Technology-based Entrepreneurship, Technology Foresight, Patent Analysis and Intellectual Property (IP) Management

PAPERS IN PEER-REVIEWED JOURNALS AND CONFERENCE PROCEEDINGS /BOOK CHAPTER/SHORT ARTICLES

TOTAL: 38 Nos.

(Peer-reviewed Journal Papers/ Conference Proceedings: 19 nos., Book Chapter: 1 no. and Short Articles: 18 nos.)

- ***Following three papers discuss useful concepts for (i) assessing intellectual property / R & D / technology readiness, (ii) linking R & D capability with appropriate collaborative / technology transfer models to enhance the impact of intellectual capital available with organizations, and (iii) technology transfer and commercialization. Insights provided are especially relevant for organizations working towards commercialization of R & D results in the advanced materials domain:***

- (1) Bhardwaj, S., Padmanabham, G., Jain, K., Momaya, K.S. and Joshi, S.V. (2015) 'Strategic alliances for advanced materials' intellectual property value chain: research and technology organisation's perspective', ***International Journal of Intellectual Property Management***, Vol. 8, Nos. 3/4, pp.207–226.

Abstract: Intellectual property value chains (IPVCs) comprise exploratory studies, laboratory demonstration, field tests, transfer and/or commercialization of technologies. Strategic technological alliances (STAs) between different organisations aim at strengthening the IPVCs. This phenomenon has influenced research and technology organisations (RTOs) due to their important role in the IPVCs. Characteristics of technology area, e.g., advanced materials technology (AMT) for this paper, play a crucial role for such alliances. An RTO shall be responsible for arranging complementary assets during exploratory studies, laboratory demonstration and field test stages, while commercialising entity shall be responsible for assembly of complementary assets for

competitive manufacturing and marketing. In this paper, an attempt has been made to develop two-step process including: 1) assessment of the level of technology development using intellectual property development indices (IPDIs) for advanced materials technologies; 2) proposing a matrix to assist RTOs in identifying the useful partners from industry, academia and R&D.

Keywords: strategic alliances; innovations; research and technology organisations; RTOs; R&D; advanced materials; intellectual property development indices; IPDIs; cooperative strategies.

(2) Bhardwaj, S., Padmanabham, G., Jain, K. and Joshi, S.V. (2015) 'Innovation paradigms: contractual models for research and technology organisations', *International Journal of Technology Transfer and Commercialisation*, Vol. 13, Nos. 3/4, pp.133–153.

Abstract: Co-development partnerships are increasingly being used to enhance innovation effectiveness and leverage complementary capabilities of partner organisations. A perceptible transition from closed innovation paradigm to open innovation paradigm is also observed. This trend is consistent with the thinking that capabilities necessary for creating innovations are often not completely available within a single organisation. Furthermore, the intellectual property (IP) regime is getting stronger by the day. These changes in the macro-environment coupled with the need to access complementary capabilities have spurred the need for novel contractual models, which facilitate transactions involving IP and other assets between different organisations. In this backdrop, the authors have attempted to analyse the trend of contractual models that have either already been adopted or are in the process of adoption by an Indian research and technology organisation (RTO) involved in the development, demonstration and transfer of materials-based technologies. This paper specifically addresses issues associated with partnerships that attempt to embrace open innovation paradigm in the face of progressively strengthening IP regimes, and their implications on contractual models suited to an RTO, with illustrative examples.

Keywords: innovation paradigm; intellectual property; open innovation; contractual models; research and technology organisations; RTOs; research and development; R&D; technology development; technology transfer; technology commercialisation; innovation; research.

- (3) Sanjay Bhardwaj, G. Padmanabham, Karuna Jain, D. Srinivasa Rao and Shrikant V. Joshi (2017) 'Technology commercialization in the advanced materials sector: Indian context', *Journal of Intellectual Property Rights*, Vol. 22, No. 3, pp. 154-167.

Abstract: This study is aimed at developing insights into the Technology Value Chain (TVC) of advanced materials-based technologies using a scenario in which technology has been transferred by a Research and Technology Organization (RTO) to a Small and Medium Enterprise (SME) in the Indian context. A Conceptual Theoretical Model (CTM) using constructs from existing TVC models is used as a basis for the case study described in this paper. This model is refined using actual evidence from an Indian RTO - the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad. The TVC of ARCI's proprietary Detonation Spray Coating (DSC) technology is used to expand upon the CTM as well as to provide new insights wherever possible. The TVC adopted for DSC includes technology incubation and proof of concept in advance of transferring the technology. These strategies, aided by government funding of the technology recipient companies, were observed to play an important role in successful commercialization.

Keywords: Technology commercialization; technology value chain; advanced materials technologies; detonation spray coating.

RESEARCH PAPERS PRESENTED IN INTERNATIONAL / NATIONAL CONFERENCES / SEMINARS

20 research papers

TECHNOLOGY FORESIGHT/ TECHNO-COMMERCIAL FEASIBILITY/ PATENT ANALYSIS REPORTS PREPARED/ SUPERVISED

Over 100 reports for

- (a) the companies in the oil and gas, ceramics, chemical, cosmetics and personal care domains
- (b) governmental agencies
- (c) in-house R & D / technological programmes in the advanced materials' domain

LECTURES/PRESENTATIONS/PANELISTS IN THE PANEL DISCUSSIONS

- Delivered more than 170 Invited lectures/presentations (including keynote / plenary lectures) during Faculty Development Programmes, Technology-based Entrepreneurship Development Programmes, Management Development Programmes, National/International Conferences, Seminars, Symposiums, Workshops , Panel Discussions etc. organized by IIT Bombay, IIT Roorkee, National Institute of Industrial Engineering (NITIE) Mumbai, AIIMS Patna, Administrative Staff College of India (ASCI) Hyderabad, Engineering Staff College of India (ESCI) Hyderabad, Osmania University, JNTU Hyderabad, Confederation of Indian Industry (CII), World Intellectual Property Forum (WIPF) and several other organizations
- Spoke on themes like Research collaborations, R & D planning, IP competitive intelligence, strategic technology alliances, technology assessment, patent analysis, new product development, contractual interaction models, new enterprise creation, product launch and growth strategies, strategic technology planning, open innovation, technology transfer and commercialization, IPR management, technology scouting and technology adoption cycle

MAJOR AWARDS, HONOURS AND RECOGNITIONS

- Doctoral research work chosen as Highly Commended Award Winner by International Journal of Operations & Production Management (IJOPM) under the category of Operations and Production Management in the Emerald/EFMD Outstanding Doctoral Research Awards. Emerald Group Publishing Limited, UK and European Foundation for Management Development (EFMD) support the award. IJOPM is one of the leading journals in the world in the field of Operations Management.

(Details are available at: emeraldgrouppublishing.com/about/our-awards/outstanding-doctoral-research-awards-odra/)

- Indian Institute of Chemical Engineers (IIChE) - ICI India Ltd. Award 2018 for Excellence in Process or Product Development. Award, presented during CHEMCON 2018 International Conference, recognized the significant success in developing an innovative model to translate scientific knowledge into industrial /commercial applications for wider social relevance
- Bharat Vikas Award 2017 for loyalty, diligence and outstanding performance in the field of Science & Technology based Entrepreneurship conferred by Institute of Self Reliance, Bhubaneswar, India

- 1st prize in 'Quiz on Intellectual Property' conducted during 'Workshop on Managing Innovation & Intellectual Property' at the 3rd International Conference on Management of Intellectual Property and Strategy (MIPS) 2016 at Mumbai during July 2016
- Appreciation Certificates/Letters from All India Manufacturers Association (AIMO) – AP Chapter, Federation of Andhra Pradesh Small Industries Associations (FAPSIA) and Andhra Pradesh State Financial Corporation (APSFC) for initiatives in the field of technology-based entrepreneurship
- "Best Stall Award" for efforts in promotion of materials technologies for entrepreneurship, while independently managing ARCI stall at Exhibition entitled "INDUS EXPO 2003" organized by National Small Industries Corporation (NSIC) and M/s Bowstring at Hyderabad (November 2003)
- Appreciation Letter from E.I. Dupont India Limited, New Delhi for successfully developing new customers for polymer materials like Nylon-6 and Polyacetal resins during MBA Professional Training (June – August 1997)
- Institute-cum-Merit Scholarship and Marshall Charitable Foundation Bombay's Scholarship during B.Tech. at Harcourt Butler Technological Institute (HBTI) Kanpur {now Harcourt Butler Technical University (HBTU) Kanpur}
- Invited to be Advisory Board member for Incubation Centre/Entrepreneurship Development Cell of a Hyderabad-based Engineering College and a Warangal-based Business School
- "Best Stall Award" for efforts in promotion of materials technologies for entrepreneurship, while managing ARCI stall at Exhibition entitled "INDUS EXPO 2003" organized by National Small Industries Corporation (NSIC) and M/s Bowstring at Hyderabad (November 2003)

MAJOR CONTRIBUTIONS TO PROFESSIONAL SOCIETIES / OTHER FORUMS

- Chairman, Indian Institute of Chemical Engineers - Hyderabad Regional Centre (IChE-HRC) for the year 2020 - 2021 and 2019 – 2020.
- Best Regional Centre (BRC) Award - 2019 was conferred on the IChE – HRC at 72nd Annual Session of IChE / CHEMCON 2019 Conference held at Indian Institute of Technology (IIT) Delhi during 15th - 19th December 2019.

- Organizing Secretary, Indian Chemical Engineers Congress (CHEMCON) Conference 2020 & 73rd Annual Session of IChE (online mode) on theme “Exploring Recent Trends in Chemical Engineering” during 27th – 29th December 2020 organized by IChE Headquarters and IChE - Hyderabad Regional Centre.
- Co-convenor, International Conference on “Recent Advances in Chemical Engineering” 2020 during 8th - 9th January 2020 organized by Department of Chemical Engineering, University College of Technology, Osmania University and IChE - Hyderabad Regional Centre.
- Honorary Secretary, Indian Institute of Chemical Engineers - Hyderabad Regional Centre (IChE-HRC) and Co-Chairman of Academia – R & D – Industry interaction Committee / Industrial Visit Committee, IChE- HRC for the year 2018 -19 and 2017-18.
- Honorary Joint Secretary, Indian Institute of Chemical Engineers - Hyderabad Regional Centre (IChE-HRC) and Co-Chairman of Industrial Visit Committee, IChE- HRC for the year 2016-17.
- President, IIT Bombay Alumni Association (IITBAA) – Hyderabad Chapter for the year 2019 – 2020 and Joint Secretary, IITBAA – Hyderabad Chapter for the year 2018-19.
- Member of the selection committees for recruitment of the scientific / technical personnel in government funded organizations.
- Reviewer of the research papers in Journals / Conferences on themes like IP / Technology transfer Technology Commercialization / Innovation.

FELLOWSHIP/MEMBERSHIP OF PROFESSIONAL SOCIETIES

- Fellow - Institution of Engineers (India)
- Fellow - Society for Technology Management
- Life member - Indian Institute of Chemical Engineers
- Life member - Materials Research Society of India

- Life member - Indian Institution of Industrial Engineering
- Life member - Global Institute of Flexible Systems Management
- Life member – The Society for Polymer Science (India)

POST-GRADUATE STUDENTS GUIDED

8 students on the following projects:

- Nanotech for Healthcare
- Concentrated Solar Power – Parabolic Trough Receiver Coatings
- Electric Vehicle Technology – A Patent Analysis
- Fuel Cell Technology – A Patent Analysis
- Feasibility Study of Sol-gel Coated Polycarbonate Sheet with Anti-scratch Property
- Feasibility Study of Exfoliated Graphite Bipolar Plate used in PEM Fuel Cell
- Feasibility Study: Solar Spectral Selective Coating for Concentrated Solar Thermal Power Applications
- A Study on Leadership Styles in R& D

CONTACT INFORMATION

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