Connecting the dots: trio conclave of R&D, academia and industry*

The two-day conference on trio conclave of R&D, academia and industry was attended by technical and managerial representatives from over 50 micro, small and medium enterprises (MSMEs) from the western industrial belt of Maharashtra and Gujarat. Several academics and researchers from engineering, technology, science, management, and research and development (R&D) institutions also participated in the deliberations and exhibition. The event aimed to explore collaboration avenues among academia, R&D institutions and industries, particularly MSMEs, in line with India's self-reliance push.

Abhay Karandikar (Department of Science and Technology) inaugurated the event, emphasizing India's vision for technological development by 2047. He emphasized the dynamic role of the MSME sector in driving economic and social progress. He pointed to the transformative potential of artificial intelligence (AI) in bringing about revolution in the MSME sector and stressed the need for key enablers to foster academic innovations such as AI, machine learning and cloud computing. The necessity of a skilled workforce to drive sectoral development in achieving sustainable growth through technological interventions was brought out. The DST-Science and Engineering Research Board's support for start-ups through Nidhi schemes was also noted, underscoring their role in fostering innovation.

T. G. Sitharam (All India Technical Education (AICTE)) discussed the organization's initiatives to transform technical education. He highlighted the creation of knowledge hubs, industry–academia collaboration, and promotion of R&D. Sitharam emphasized integrating vocational education with training and skilling, shifting from cognitive to non-cognitive skills and utilizing online learning platforms like Swayam. He stressed the need to leverage India's strength in technical education, to emerge as a knowledge capital and the need to establish incubation centres for promoting startup culture in students.

Erik af Hallstrom (Consul General of Finland in Mumbai) spoke about the longstanding ties between India and Finland in science, technology, engineering and mathematics (STEM) education and research. He underscored the importance of financial investments in driving India's growth and advocated for enhanced international collaboration. Eric Hallstrom delved into the importance of investments and microeconomics in driving India's growth trajectory, highlighting the pivotal role of international science and technology collaboration in India's development. He advocated for enhanced co-operation between India and Finland at the global level, concluding optimistically by asserting India's potential to emerge as the next global power.

Sridhar Vembu (Zoho Corporation and President-General of Bharat Tech Foundation (BTF)) discussed opportunities within MSMEs and the 'big tech' economy. He shared a case from Sivakasi, Tamil Nadu, where collaboration with the Central Electrochemical Research Institute (CECRI) turned stored chemicals from fireworks into EV batteries. Vembu stressed the importance of bridging the gap between industry and educational institutions like IITs and the need for MSMEs to set up R&D centres.

G. D. Yadav (Institute of Chemical Technology (ICT), Mumbai) highlighted the need for immediate action toward achieving net-zero emissions. He emphasized fostering an entrepreneurial spirit in academic institutions, citing success of ICT Matunga in producing over 700 entrepreneurs.

Samir Somaiya (Somaiya Vidyavihar University and Godavari Biorefineries Limited) discussed the benefits of industry–academia collaboration from his experiences. He emphasized the commitment of university to sustainability and integrating traditional knowledge systems with modern science and technology.

Narayanan Ramaswamy (BTF) gave the welcome address. He shed light on the beginning of foundation, explaining its role in bridging the gap between engineering professionals and rural populations through technological advancements.

A. Jayakumar (BTF) pointed to the close linkage between technological and rural empowerment in India. This linkage is relevant in advancing local technologies that can drive sustainable development in rural areas. The speaker said that, by promoting innovations tailored to the needs of rural communities in areas like affordable clean energy, efficient farm practices and affordable healthcare, the country can enhance productivity, increase livelihood opportunities, and improve quality of life, thereby fostering economic independence and resilience.

V. N. Rajasekharan Pillai (Somaiya Vidyavihar University) chaired the first technical panel, noting India's rising contribution to global R&D but highlighting the need for significant commercial breakthroughs. He called for a multidisciplinary approach to foster a culture of product innovation.

Mohan B. Rao (Confederation of Indian Industries (CII), Task Force of Education, Mumbai) highlighted the potential roles of communicating and aligning the goals between the different sectors and ensuring that R&D efforts are more closely related to industry needs. Additionally, CII-like organizations can pool resources, reduce duplication of efforts, and foster innovation by leveraging a wide network of expertise and facilities, ultimately accelerating technological advancements and improving competitiveness.

Ameya Prabhu (Indian Chamber of Commerce) focused on the duties of industries and R&D institutes in achieving sustainable development goals. He emphasized on advancing development without harming the environment and reducing the carbon footprint. Prabhu highlighted the disproportionate impact of environmental issues on disadvantaged populations and called for greater inclusivity in ESG goals.

The panel on 'Catalyzing R&D for MSME', 'Driving Viksit Bharat@2047', moderated by Raman Ramachandran (Somaiya Vidyavihar University) brought together experts to discuss the role of R&D in promoting MSME growth. Rahul Mirchandani (Aries Agro Ltd) shared his company's journey and the importance of collaboration between large corporations and MSMEs. Madhav Nair (Bank of Bahrain and Kuwait) stressed the need for more training and

outreach programmes to increase MSME awareness of registration processes. Palak Seth (Reliance Jio Institute) emphasized applied research relevant to industry needs, citing the success of the Amul movement as an example of effective collaboration.

The panel in 'Tech and transition: creating new-age R&D and collaboration opportunities', moderated by K. Nandakumar (Chemtrols, Mumbai) highlighted the need for increased investment in research and development. The panel consisted of Hemant Joglekar (Asian Paints, Mumbai), Surya Darbha (IIT, Mumbai), Ranjana Maitra (University of New Haven), Mohan B. Rao (CII Western Region Taskforce for Education) and Datta Kuvalekar (Forbes Marshall, Pune). They discussed the importance of quality and applied research, fostering innovation and entrepreneurship, integrating new technologies and reforming the education system to prioritize research and critical technologies.

In the session on 'success stories', collaborations between the Indian Space Research Organisation (ISRO) and Academia, as well as the Somaiya Research-innovation-incubation-Design-Laboratories (RiiDL), were presented. A. Rajarajan (Satish Dhawan Space Centre) underscored the importance of synergy among technology, space agencies, industry and academia for advancements in space exploration and technological innovation. Gaurang Shetty (RiiDL) shared his journey from inspiration at a student design competition to establishing RiiDL, which has incubated numerous start-ups and developed innovative solutions.

Shiv Shukla (Reliance Foundation, Mumbai) highlighted the importance of R&D in academia and industry, focusing on student needs. He emphasized the need for management colleges and professors to showcase MSME startup case studies to attract more ideas and investments.

Robin Banerjee (Nuclear Research Private Limited, Mumbai) spoke about the interconnectedness of education, business, and economy as the most important factors for development. He noted economic growth trajectory of India and the potential for surpassing major global economies in the future. Banerjee discussed the dual nature of AI as both a disruptor and an enabler, emphasizing the need for educators to stay updated with technology to remain relevant.

Apurv K. Mishra, from the Prime Minister's Economic Advisory Council, New Delhi, emphasized the importance of R&D spending for development goals of India. He highlighted the disparity in R&D expenditure between India and China and stressed the need for India to increase its investment to become a technological superpower.

Manoj Chaudhary (National Gati Shakti University) focused on R&D-driven transformation for MSME growth. He discussed the PM Gati Shakti Yojana and Gati Shakti Vidyalaya initiatives aimed at integrating infrastructure and logistics with technology and human resource development. Chaudhary highlighted the importance of industry–academia collaboration and the need for students to define and address societal problems through innovative solutions.

Swami Swatmananda (Chinmaya Mission) spoke about aligning the organizational vision for social growth, emphasizing India's rich scientific and value systems. He advocated for a blend of science and spirituality in envisioning the future, highlighting the importance of mental well-being and resilience.

The session on 'New-age infrastructure and the industry–academia collaboration' featured Srisudha Vishwanathan (Edutech4 Space, UAE). She highlighted the potential of India's youth population and the positive impact of technology-driven startups. Srisudha stressed the importance of practical learning, integrating work experience during studies, and instilling the dignity of labour in students. She called for better guidance on government funding schemes for students, especially in rural areas.

In the session on industry–academia collaboration success, the Kirloskar Group team, T. G. Vijaya and Ashwin Kumar, discussed the company's commitment to empowering people and innovative engineering solutions. The group operates a fully solar-powered plant and engages in organic farming. They emphasized the integration of advanced technologies to enhance efficiency and competitiveness and highlighted establishing a centre of excellence for sustainability with Kirloskar Oil Engines.

The session 'Sculpting excellence in industry–academia collaboration: new frontiers', moderated by Achala Danait, featured speakers who emphasized the need to accelerate innovation and enhance R&D collaboration between academia and industry. The panelists in the session were Ramesh Unnikrishnan (AICTE), Srinivasan Iyengar (Jamanlal Bajaj Institute of Business Studies, Mumbai), Arun Kumar Sharma (NECTAR), Anjani Prasad (South Asia Textile Effect, Archrome, Mumbai) and Ninad Karpe (100X.VC), promoting entrepreneurship, learning from success stories, establishing academia as experience centres and developing innovation portals. The importance of early internships for real-world experience and inspiring entrepreneurship was highlighted.

Suresh Ukarande and his team of academics from the Somaiya Vidyavihar University, Mumbai, facilitated the interaction of the experts from the R&D instructions and the industries with the undergraduate, postgraduate and research students. The exhibitions and focused interactions explored the possibilities of industry internships, project traineeships and research partnerships. A task force on systematic implementation of the recommendations of the conclave in a time-bound manner was also constituted.

The trio conclave of R&D, academia and industry served as a platform for exploring collaboration avenues and fostering innovation among MSMEs, academia and R&D institutions. The event underscored the importance of leveraging technological advancements, fostering industry–academia collaboration, and integrating sustainability and traditional knowledge systems. Key takeaways included the need for increased investment in R&D, practical learning and early internships to bridge the gap between academic theory and practical application. The conclave highlighted India's potential for technological and economic growth and the crucial role of MSMEs and startups in achieving these goals. Overall, the discussions and success stories presented during the event provided valuable insights and strategies for driving India's progress toward becoming a self-reliant and technologically advanced nation by 2047.

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