Rebooting FITT

FITT has trudged along for over two decades and admirably shouldered the heavy responsibility of strengthening technology transfer in a comprehensive manner at IIT Delhi. Yes, much more could have been done. However, to move on with a renewed zeal on a rising trajectory, it is prudent to reorient strategies going forward while evaluating the hits and misses in this journey. In our experience, knowledge transfer from the academia is a facile phenomenon if confined to spillovers like movement of students and scientists, contract research and consulting assignments but, becomes challenging if the goal is to extract fuller value from information and innovations embedded in the research resultants. The mind space of a mature Technology Transfer Office is, thus, primarily occupied with the objectives of building capacity and capability, scaling-up licensing deals, enabling research spin-offs or for devising innovative models of outreach and sustained industry engagement. In short, it’s about moving ahead with impactful social and economic footprints. FITT broadly aligns its priorities with the Institute (IIT Delhi) vision. Numerous internal discussions and brainstorming give a sense of purpose. There is no denying the Institute’s current strong focus on innovation and entrepreneurship that is consistent with the national development themes. The thinking at FITT hovers around strengthening the existing robust platforms which, since inception, are perfectly aligned in the direction espoused nationally. Concurrently, the next phase of growth and development shall veer around the establishment of Research Parks that would serve as hotbeds of technical collaborations, creative programs and venture creation. FITT has jumped the whole hog into pursuing the Research Park initiative. The renewed focus and energy towards creating partnerships and capturing value from these is getting all around emphasis and importance. Many segments of the economic activity have been liberalized. Institutional formats like FITT are coming into the foreground. And, to articulate an ever active and dynamic profile with an eagerness to lounge forward, FITT has adopted a new logo which reflects the crucial role of deeper stakeholder engagement, effective mechanisms for knowledge transfer and a vibrant start-up platform at academia.
Prof Sushil is the Abdulaziz Alsagar Chair Professor (Professor of Strategic, Flexible Systems and Technology Management), at the Department of Management Studies, Indian Institute of Technology Delhi. He was also the Deputy Director (Operations) from July 1, 2015 to June 30, 2016. He has served as Visiting Professor and delivered seminars in many leading universities, such as University of Minnesota, Minneapolis, MN, Stevens Institute of Technology, NJ, University of Lethbridge, Alberta, Université Paris 1 Panthéon-Sorbonne, Paris. He is an active researcher and has supervised more than 60 doctoral dissertations. He has twenty books to his credit in the areas of Flexibility, Strategy, Systems Thinking, and Technology Management and over 300 papers in various refereed journals and conferences. He is the Editor of Book Series on Flexible Systems Management published by Springer. He is the Founder Editor-in-chief of Global Journal of Flexible Systems Management and is also serving on the Editorial Boards of leading international journals.

He has pioneered the area of ‘Flexible Systems Management’ and made original contributions to the field of knowledge in the form of interpretive approaches in management such as SAP-LAP models/linkages, Total Interpretive Structural Modeling, and Interpretive Ranking Process. He has evolved the concept and framework of ‘Flowing Stream Strategy’ as strategic flexibility to manage continuity and change. He has also provided mantras for continuous organizational vitalization (LIFE), and models for strategic performance management (Flexible Strategy Game-card), sustainable enterprise (Star Model) and strategy execution (4A’s Model).

Currently, Prof Sushil is serving as Independent Director on the Boards of RINL, HSCC, and River Engineering. He has acted as consultant to both governmental and industrial organizations; a few representative ones are Ford Foundation, APCTT, UN, Defense Research and Development Organization (DRDO), Wipro Infotech, LG Electronics, Rockwell International, Tata Consultancy Services, James Martin & Co, Gas Authority of India Ltd, Sona Koyo Steering Systems, NBCC, and DGS&D. He is the Founder President of the professional body, ‘Global Institute of Flexible Systems Management’. He has been awarded 2014 AGBA Fellow (by Academy for Global Business Advancement, USA).

Aditya Mittal received his B Tech in Biochemical Engineering from Harcourt Butler Technological Institute (HBTI), Kanpur, India (1996). Through campus placements, he was recruited as a Management Trainee with Shaw Wallace & Co Ltd, a blue chip company in 1996 with an annual turnover of over 1200 Crores. Within three months of his stay in Mumbai (then called Bombay), he was deputed as a Brewer in the largest brewery (Skol breweries) of Shaw Wallace & Co at Uran (in the outskirts of Bombay, now a part of Navi Mumbai). There, he was a part of a team that launched the beer “Royal Challenge” in various parts of India – for few years immediately after its launch, Royal Challenge was one of the leading beers in India. The innovation of bottling a specific beer brand (Royal Challenge) in green bottles to prevent photo-oxidative degradation was introduced first at Skol breweries in India and is now a standard practice by all leading beer brands in India. In addition to reaching several milestones in
beer production (for the brands Royal Challenge, Haywards 5000 and Haywards 10000), he was instrumental in commissioning of state-of-the-art cleaning-in-place (CIP) and carbon dioxide recycling systems at Skol breweries. He also developed a method of making paper out of brewery waste, specifically from the lauter tun stage of the process – that waste was being utilized only as part of cattle feed at the time. Within eight months of his stay at Skol breweries, Aditya was made a part of a three-member Quality Assurance team to oversee beer production processes in all breweries operated in India by Shaw Wallace & Co Ltd at the time. He considers his experience at Shaw Wallace & Co Ltd both at the corporate and brewing shop floor levels, to be as important in his personal and professional growth as was his four year hostel stay at HBTI, Kanpur.

Owing to his interests in research from his B Tech days and some family observations regarding occupational hazards (e.g, regular consumption of ethanolic beverages) in spite of a very comfortable lifestyle, Aditya left Shaw Wallace & Co Ltd after over a year to pursue his PhD from Drexel University, Philadelphia, USA. In 2002, he earned his PhD in Biological Sciences (Membrane biophysics and exploration of viral fusion mechanisms) under the mentorship of Prof Joseph (Joe) Bentz. Additionally, at Drexel, he worked on drug transport by the multi-drug resistance protein MDR1 in collaboration with GlaxoSmithKline, and, was involved in synthesis of gold/silver nanoparticles and nanowires using a contact-less method called SCBE at the department of Chemistry. He then worked as a Visiting Fellow at the National Institutes of Health (NIH), Bethesda, MD, USA on remodeling of biological membranes with Dr Leonid Chernomordik. Subsequently, he joined IIT Delhi (2004) as an Assistant Professor where he set up his independent research program towards exploring kinetics and self-assembly in biological systems.

As an independent researcher, he chose to come out the shadows of his stalwart American mentors by initiating research activities that were not mere continuation (direct or indirect) of his doctoral or post-doctoral work. With a few undergraduate students and one doctoral student, he set-up real time video microscopy for measuring microbial cell movements and high-resolution fluorescence microscopy for live mammalian cells. Both were firsts for IIT Delhi. Simultaneously, he started developing rigorous analytical techniques for analyzing single cell data from the measurements. Being one of the pioneers in extracting information from real-time video microscopy (RTVM) data on cell-cell fusion, in 2007 he analyzed RTVM data of whole organisms resulting in a top cover article from India. Analytical methods indigenously developed by him are now routinely integrated in RTVM imaging software and formed the foundations of his further contributions in cell biophysics and computational biology. In late 2005, he started working on bacterial assembly of nano-magnets – a first from India. By 2006, he had become a part of a very selective group of researchers in the world who could culture nano-magnet synthesizing magnetotactic bacteria. Subsequent to his pioneering work on bacterial nano-magnets, which was also covered quite extensively by *Nature India* in 2007 and 2008, several research laboratories in India started working in this area.

In 2008, Aditya was approached to serve as one of the founding members of the School of Biological Sciences at IIT Delhi for popularizing modern biology amongst UG students, while developing vibrant post-graduate programs in biology. His efforts, with major assistance and contributions from his School colleagues, into spreading biological sciences education through newly designed courses were appreciated across the IIT Delhi community and led to formulation of a foundation 100-level core UG biology course for all incoming freshmen at IIT Delhi. Realizing the extreme challenges towards continuing his cutting-edge experimental research while setting-up a new academic entity at IIT Delhi, he started focusing on development and application of his analytical methods to basic biological problems at a molecular level. By 2010, his efforts resulted in opening of a completely fresh avenue in the area of protein folding. Based on analysis of thousands of 3D protein structures (the largest dataset analyzed till that time), in collaboration with B Jayaram at IIT Delhi, Aditya published a series of studies that added an altogether new dimension towards attempts at solving the “protein folding problem”. This became popularly referred to as the “stoichiometry driven protein folding hypothesis”. Even after more than six years and several critiques, his findings remain undisputed. This in itself is an admirable achievement in the rapidly evolving field of computational biology.

In 2012, Aditya became one of the youngest full Professors at IIT Delhi. His current research focuses on exploring origins of biological self-assembly at a molecular level. His independent research has resulted in four cover articles till date along with several recognitions. He was honored as an Associate of the Indian Academy of Sciences and featured in the cover story of a 2006 issue of *Chemical & Engineering News* (American Chemical Society) as “India’s Young Blood”. He was also designated “Asia21 Young Leader” by the Asia Society, New York, USA. He has served/serves as an Editor/Editorial Board Member for scientific journals in both applied and pure biological sciences, and serves as reviewer in several top multi-disciplinary journals. He has also Chaired/served-on several national and international committees on research and education. He has guided/supervised several post-graduate theses (doctoral and masters) and several undergraduate projects. For the work done under his mentorship, students have received several awards (of special note are two best M. Tech. theses at IIT Delhi and one doctoral thesis related American Society for Cell Biology award). He has served in various co- and extra-curricular capacities at IIT Delhi (of special note are faculty-in-charge/Chairman of NCC, the student Board for Recreational and Creative Activities and Tryst-the annual science and technology student festival of IIT Delhi, and, as the Contingent Leader of the staff sports team). Currently, he is serving as the Associate Dean of Student Affairs (Events). In 2015, a Teaching Excellence Award was conferred on him by IIT Delhi.
Having been nurtured by a single mother (Asha Mittal – retired as Mathematics faculty from Kirori Mal College, Delhi University), Aditya's upbringing included a solid appreciation for creating time towards holistic development and pursuing interests beyond the purely professional. He holds a diploma in Indian classical music from the Prayag Sangeet Samiti for playing the Tabla. He has also remained active in sports from his school days. Since joining IIT Delhi, he has won several medals in the Inter-IIT staff sports meets held at different IITs (gold for Badminton-2008 & Chess-2009, silver for Badminton-2007, 2013, 2014, bronze for Badminton-2006, 2009, 2012). An avid hiker, he has covered parts of the Appalachian Trail in the USA. Every year, he disappears with his wife (Shweta Mittal) and son (Siddhant Mittal) into the wilderness in India for about two weeks exploring isolated and less traveled parts. Some of his travels include staying in a tent on a white sandy beach next to the jungles of Adaman islands for more than a week, a few days in the Bomdila Monastery, and hikes up to Hatu Peak (~11000 feet, it was not motorable then), Sandakphu (~12000 feet) and Bum La Pass (~16000 feet).

Aditya aims to contribute to the growth of indigenous research while solving biological problems (of his interest) either on his own or in collaboration with his Indian colleagues. He wishes to be a representative of academics who are able to balance their outside-the-box research interests and strong teaching commitments, while creating time to enjoy non-professional interests also. Often referred to as “Addy” by his friends and ex-students, he is up for a scientific discussion any time, especially with the incentives of a fine brew (draughts are preferred) or the choicest single malts.

Abbreviations

AM: Department of Applied Mechanics,
BSTM: Bharti School of Telecommunication Technology and Management,
CARE: Centre for Applied Research in Electronics,
CAS: Centre for Atmospheric Sciences,
CBME: Centre for Biomedical Engineering,
CES: Centre for Energy Studies,
CRDT: Centre for Rural Development and Technology,
CPSE: Centre for Polymer Science and Engineering,
CE: Department of Civil Engineering,
Chy: Department of Chemistry,
CSE: Department of Computer Science and Engineering,
DBEB: Department of Biochemical Engineering and Biotechnology,
DMS: Department of Management Studies,
EE: Department of Electrical Engineering,
HUSS: Department of Humanities and Social Sciences,
IDDC: Instrument Design Development Centre,
ITMMEC: Industrial Tribology,
KSBS: Kusuma School of Biological Sciences,
ME: Department of Mechanical Engineering,
Phy: Department of Physics,
TT: Department of Textile Technology