

AANCEB 2015

37th Publication



India as a global manufacturing hub by 2022
Panacea to our aspirations



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AANCEB 2015

(37th PUBLICATION SINCE 1963)

On the occasion of

NATIONAL SEMINAR ON
India as a global manufacturing hub by 2022
Panacea to our aspirations

18th January, 2015
at Majestic-I, Hotel Lalit,
Near Mumbai International Airport, India



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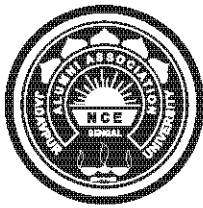


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NATIONAL SEMINAR ON India as a global manufacturing hub by 2022 Panacea to our aspirations

18th January, 2015 at Majestic-I, Hotel Lalit, Near Mumbai international Airport

PROGRAMME SCHEDULE

09-00 hrs to 12-25 hrs	INAUGURAL SESSION WITH TEA/COFFEE BREAK
Keynote address by	Prof. C B Bhattacharya (Dean of International Relations, Pietro Ferrero Chair in Sustainability, European School of Management and Technology, Berlin, Germany).
Address by Chief Guest	Mr. K Venkataramanan (CEO & MD, Larsen & Toubro Ltd)
Address by Guest of Honour	Smt. Arundhati Bhattacharya (Chairperson, State Bank of India)
12-25 hrs to 13-15 hrs	LUNCH BREAK (50 min)
13-15 hrs to 14-50 hrs	TECHNICAL SESSION-I
Innovation & high tech manufacturing in India : Mr Kishor Chaukar Chairman, Tata Teleservices, (Maharashtra) Ltd.	
Role of SME& MME in job creation: Mr. R.B.Gupte (Director Govt. of India, Ministry of MSME)	
14-50 hrs to 15-10 hrs	TEA BREAK (20 min)
15-10 hrs to 16-45 hrs	TECHNICAL SESSION-II
Promoting Skill Development and emphasis on Talent management : Mr. Atul Bhatnagar (COO, National Skill Development Centre, Govt. of India)	
Paradox of Indian Manufacturing : Mr. M. S. Unnikrishnan (MD and CEO of Thermax Limited)	
16-45 hrs to 17-50 hrs	Panel Discussion : Can India become "Germany of the east" & not "factory to the west"?
Panel Chairman : Mr. Ramani Iyer Former CGM, MTNL Mumbai	
Panelists :	
Mr. Debasish Mallick (Deputy Managing Director , Export-Import Bank of India)	
Mr. M. S. Unnikrishnan (MD and CEO of Thermax Limited)	
Mr. Nandakumar (CMD , Chemtrolls Industries Limited)	
Mr. Subramaniam Vutha (Advocate - Intellectual Property Right , Member International Technology Law Association-USA , & Former legal executive Tata Unisys, Tata Infotech)	
Mr. Rajrishi Singhal (Senior Fellow , consultant and policy analyst with Gateway House, Former Executive Editor , Economic Times)	
Concluding Remarks & vote of thanks by Convenor of Seminar Committee	

Alumni Association

NCE BENGAL & JADAVPUR UNIVERSITY
(Founded in 1921)
Regd. No. 6518 under Societies Act XXVI of 1961
179



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AKM/Branch-Seminar/2014-15/406

Date : 01-01-2015

MESSAGE

I am glad to know that Mumbai Branch of Alumni Association, NCE Bengal & Jadavpur University is organising a National seminar under the theme *"India as global manufacturing hub by 2022- Panacea to Our Aspirations"* on the 18th. January 2015 at Mumbai.

I understand that the Mumbai branch of the Alumni Association of Jadavpur University had organized many technical & industrial seminars in the past. The topic of the Seminar is very timely when there is a global recession in different industries.

I am sure; an active branch like Mumbai will come out with definite recommendations after the deliberations.

I wish all success of the Endeavour.

(A.K. Mitra)

President



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Editorial



I have always got inspiration from Ernest Hemingway's novel "The old man and the sea", which got him Nobel Prize in literature in 1954. It depicts the story of an epic struggle between an old, seasoned fisherman and the greatest catch of his life. For eighty-four days, Santiago, an aged Cuban fisherman, had been fishing in the sea and had returned empty-handed. But the skeleton of the large marlin was still attached to his boat. In spite of all such struggles, he still dreamt of his next journey with a boy named Manolin.

Our AANCEB publication also revolves around the similar concept of the story. In the past, we debated a lot about the content of the AANCEB, but today we face a harder nut to crack. We are confronted with stronger questions like, should we publish it at all? Who will read this? In the era of information overflow, what is the purpose of creating one more publication with articles?

In today's result-oriented culture, all such questions point out to the terminal value of this endeavour. However, there are still some people, like Santiago, who enjoy the journey. So, is our editorial board. And moreover, who knows that someday somebody will not be benefited from our initiative?

I personally opened past AANCEBs, some of them are more than 35 years old, and found a vast amount of technical articles relevant even after a long period of time. Our editorial board proceeded with the full version of AANCEB 2015. That means it will not only contain mere seminar information, member list and some advertisements but also will text our collective thoughts in the form of articles.

Our editorial board took enormous effort in collecting data, following up with the authors, checking content and context of articles, and finally correcting proof that came out of the printer's press. Like the past years, we also faced problem of obtaining advertiser's material to feed the printer's design sequence.

Traditionally, our AANCEB contains a list of alumni members. In the past, this list proved to be of great help in social as well as professional networking. Our assistant editor Mr. Anup Ghosh took voluntary charge to maintain this list all through the year. However, making it 100% updated requires a lot of feedback from the members at the earliest. In spite of all the efforts from us, we feel the same may not be perfect at the time of printing. My general appeal to all the readers is to kindly share information to correct the outdated data.

To conclude, I want to go back to the story I told in the beginning, again. Like Manolin who felt the passion in old Santiago's eyes, I feel the same about the past editors when I have seen the earlier issues of AANCEB. So, I have decided to reprint three articles from 1977, 1981 and 1996 editions. I hope that the readers will enjoy and appreciate the relevance of these articles.

It is Dec the 31st, 2014 when I finish writing this editorial. So, good wishes to all for a very happy, safe and meaningful New Year 2015.

Dibyendu Chakraborty

1991 Mech – Chief Editor

On behalf of editorial boardmembers,

Mr. Ramanil Iyer, Mr. Ashok K Adhikary, Mr. Anup Ghosh,

Ms. Sumita Ghosh, Mr. Meghdut Manna



A common thread that runs across industries from Oil & Gas, Refineries, to Chemical and Petrochemical plants, Steel, Cement, Fertilizers, Power, etc. is the criticality in automating, monitoring, and managing the infinite processes that constitute them.

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Speakers' profile



Smt. Arundhati Bhattacharya , Chairman, State Bank of India

Smt. Arundhati Bhattacharya assumed the office as Chairman of State Bank of India on 7th October, 2013.

She is the first woman Chairman of the country's largest Bank. She also has the distinction of being the first woman Managing Director of the Bank.

A Post Graduate alumna from the Jadavpur University, West Bengal, Smt. Bhattacharya joined SBI in the year 1977 and since then has held various important portfolios. Before taking charge as Managing Director, she was MD & CEO of SBI's investment banking arm, SBI Capital Markets. Earlier, as Dy. Managing Director in SBI, she headed the largest Human Resources Department of the Banking Industry consisting of a work force of over two lakh employees, which includes 65,000 Officers.

In her extensive service in the Bank, she has had the opportunity of working in Metro, Urban and Rural areas across the length and breadth of the country. She has handled forex, treasury, retail operations, HR and investment banking portfolios and large Corporate Credit. As Chief General Manager (New Businesses), Smt. Bhattacharya was involved in setting up several new companies / initiatives of the Bank including SBI General Insurance, SBI Macquarie Infrastructure Fund, SBI SG Securities Ltd, etc., as well as the launch of new IT platforms such as Mobile Banking and Financial Planning in the Bank. As Chief General Manager, Bengaluru Circle, she took keen interest in promoting Financial Inclusion and financing of Self Help Groups. She also had a stint in the Bank's New York office where she was in charge of monitoring branch performance, overseeing External Audit and Correspondent Relations.

Forbes Asia has included her in the elite club of Fifty Most Powerful Business Women in Asia and also the Top Indian Most Powerful Woman in their list of Top 100 World's Most Powerful Business Women. She has also been featured in the Fortune List of Top 50 globally most powerful women in business and in the Asia-Pacific region she is ranked among the top 5. She has also been adjudged as the Most Powerful Business Women by Business Today (No.1 Business Magazine in India).

She participated as a member in the Panel Discussion on "India and South East Asia" organized by International Institute of Finance. She was invited by the Board of Directors of US-India Business Council to deliver keynote address at their 39th Anniversary Leadership Summit, attended by about 100 top business leaders.

Her interests include reading and travel. She is also associated with various initiatives for empowering the challenged and differently abled with the aim of integrating them into the society.



Mr. Krishnamurthi Venkataramanan
Chief Executive Officer & Managing Director, Larsen & Toubro Limited

Mr. K. Venkataramanan has been associated with L&T with over four decades in various positions of responsibility. A graduate in Chemical Engineering from IIT, Delhi, he joined L&T in 1969. After a series of successful assignments, he was elevated to the Board of Directors of the Company in May, 1999, and appointed Chief Executive Officer and Managing Director on April 1, 2012.

Mr. Venkataramanan is credited with helping in the transformation of L&T from a fabrication-driven EPC contractor to a technology led player. He also laid the foundations for project engineering & execution as well as conceptualized and designed the water front load-out facility at Hazira, Surat for large offshore platforms.

He is a Distinguished Alumni Awardee of IIT Delhi in 2005. He is the first Asian to be appointed as Chairman of the Board of Directors of the 'Engineering & Construction Risk Institute, Inc.', USA for a two year term ending in May 2010. He is an Honorary Fellow of the Institute of Chemical Engineers (IChemE), UK – the second Indian to receive this recognition from the world's most reputed body in chemical engineering space. He is also a Fellow of the Indian Institute of Chemical Engineers, and currently the Chairman of the Capital Goods Committee of FICCI.

An ardent sportsman, he is as much at home on the tennis and badminton courts as on the cricket pitch. A technology aficionado himself, he is keen to encourage the growth and development of young engineering talent.



Prof. CB Bhattacharya,
ESMT European School of Management and Technology in Berlin, Germany

Prof. CB Bhattacharya is the Pietro Ferrero Chair Professor in Sustainability at ESMT European School of Management and Technology in Berlin, Germany. He was previously the E.ON Chair Professor in Corporate Responsibility. On September 1, 2010 the president appointed him the Associate Dean of International Relations and on April 1, 2011, Dean of International Relations.

He received his PhD in Marketing from the Wharton School at the University of Pennsylvania in 1993 and his MBA from the Indian Institute of Management in 1984. Before joining ESMT in 2009, he was the Everett W. Lord Distinguished Scholar and Professor of Marketing at the School of Management at Boston University. Before joining Boston University, he was on the faculty at the Goizueta Business School, Emory University.



**Mr. Kishor Chaukar,
Chairman, Tata Teleservices (Maharashtra) Ltd.**

Mr. Kishor A. Chaukar retired as the Managing Director of Tata Industries Limited (TIL) serving from 1998 till July 31, 2012. He is a graduate in Economics and a post-graduate in Management from the Indian Institute of Management at Ahmedabad.

Kishor was a member of the Group Corporate Centre at the House of Tata and chaired the Tata Council for Community Initiatives for several years. Besides business and management, he is interested in Corporate Sustainability, Human Rights and Human Upliftment, and was a member of the Boards of some national and international organizations like Global Reporting Initiative – Amsterdam, the Tata Memorial Centre – Mumbai, Social Accountability International - New York among others.

Currently he is a director of some companies including Tata Communications Limited, Tata Teleservices Limited, Tata Investment Corporation Limited, Tata Business Support Services Limited, Tata Trustee Company Limited, Tata AIA Life Insurance Company Limited, TACO and Praj Industries. He is the Chairman of Tata Teleservices (Maharashtra) Limited and is also a trustee of the Bhartiya Agro Industries Foundation – Pune.

Kishor's earlier stints were at ICICI Securities as its Managing Director and ICICI Limited where he was a director when he joined Tatas. He also served at Godrej Soaps Limited and also at Bhartiya Agro Foundation, an NGO extending relevant technology into rural India for upliftment of the less privileged.



**Mr. R. B. Gupta ,
Director Govt. of India, Ministry of MSME**

Mr. R.B.Gupte, is a Chartered Engineer and Member of Institution of Engineers (India) attached to the Textile Engineering discipline. After putting up ten years of service in the private sector, he joined Group 'A' Gazetted services in the Central Government through UPSC. He has worked in MSME-DI, Patna, Mumbai, and Agartala in the capacity of Assistant Director and Deputy

Director and deputed to Ministry of Finance, for three years. In August 2011, Mr Gupta joined as Director at MSME-DI, Kanpur which was nodal office for the state of Uttar Pradesh.

Mr Gupta has provided guidance to more than 15,000 entrepreneurs in the states of Bihar, Maharashtra, Tripura, Mizoram and Uttar Pradesh by organizing number of workshops, seminars and training programmes and individual counseling. He also held the additional charge of Principal Director, Fragrance and Flavour Development Centre, Kannauj and moved the Government owned Society to profits in six months.



**Mr. Atul Bhatnagar ,
COO, National Skill Development Centre , Govt. of India**

Mr. Atul Bhatnagar is the Chief Operating Officer of National Skill Development Corporation. He is a quintessential banker with over two decades experience in the global banking business.

As a Mechanical Engineer from IIT-Kanpur, Mr. Bhatnagar's first stint in the corporate world, however, was with Tata Motors (then known as Telco) in 1985. After a two year stint in Telco, he went to IIM, Calcutta for a Post Graduate Diploma in Management majoring in Finance and Marketing. His career in banking started in 1989 when he joined Citibank in Chennai, where he was part of the team which launched the bank's credit card business in India.

In 2008, he joined UK-based Barclays as Chief Operating Officer in Kenya where he spent the next four years. During his stint in Kenya, Mr. Bhatnagar won the 'Male Diversity Champion' award picked from among 1500 nominees from the bank's global pool. Amongst all his achievements, he considers this as the most important one and in his own words the '*Oscar among corporate awards*'. The award was recognised by the bank's female employees as the champion male colleague who strived to bring gender diversity at workplace for the bank globally.

During his stint in Barclays, he also bagged an award for the best COO in Africa and also helped his bank bag the Best IT Bank given by Business Journal Africa, which also featured him on the cover of the magazine's July 2011 issue.

After spending nearly a decade and half outside India, Mr. Bhatnagar found his 'home calling' when the opportunity to work at NSDC came up in March of 2013.



**Mr. Ramani Iyer,
Former- CGM, MTNL Mumbai**

Ramani Iyer is an alumnus of Jadavpur University with multidisciplinary expertise in the Telecom sector. He has held important assignments in the Department of Telecommunications over a span of 35 years and has served as a Director on the Board of MTNL.

His services were lent to the United Nations as an Expert in the field of Digital Communications for a Telecom project in Africa. He has been on several Committees set up by the DoT for formulating the detailed specifications of equipment to be deployed in the network.

As a freelance consultant, he has been actively associated with TETRA and CAS projects in India and in the preparation of the detailed project report for a major project in Bhutan. Currently, he is on the panel of visiting faculty for a few academic institutions.

He is a Fellow of the Institution of Electronics & Telecommunication Engineers (FIETE).



**Mr. M. S. Unnikrishnan,
MD and CEO of Thermax Limited**

Mr. M. S. Unnikrishnan is the Managing Director & CEO of Thermax Group, the Rs. 6000 crore energy and environment solutions company, headquartered in Pune, India. The company has a global presence and operates in the areas of heating, cooling, power, water and waste management, air pollution control and chemicals.

Mr. Unnikrishnan held the position of Chairman of CII's National Committee for Capital Goods. He is also a Member of the sub-committee set up by the Planning Commission of India for preparing the technology development path for country. He is a Member of the Development Council constituted by the Ministry of Heavy Industries, Government of India, to create strategies for the industrial development of the country. He is also a Member of the Apex Council to implement the 'Prime Minister's Fellowship Scheme for Doctoral Research', a Joint Initiative from the government and industry to encourage industrial research and nurture talent.

He co-chairs the National Committee for Capital goods of FICCI, and is a Member of the Executive Committee of Maharashtra Chamber of Commerce, Industries & Agriculture (MCCIA). He also served as a Member of the special Sub-committee created by the CII for enabling the Civilian Nuclear Agreement between India and USA.

Mr. Unnikrishnan has been honoured with the 'Asia Innovator Award' at the 11th CNBC Asia Business Leaders Awards, held in Bangkok in November 2012. He was awarded *"for his inventive thinking in business and his leadership in an organization that has innovation at its core"*.

Mr. Unnikrishnan began his career with Thermax after graduating from the Regional Engineering College, Nagpur in 1982 in Mechanical engineering. He has also completed his Advanced Management Programme from the Harvard Business School, USA.

After joining Thermax as a graduate trainee, he went on to establish the marketing set up for the Energy division of Thermax in the Western Region. From 1987 and 1997, Mr. Unnikrishnan worked with EID Parry as the Head of Engineering Division and with Terrazzo Inc, U.A.E. as AGM heading the manufacturing, marketing and commercial operations.

After rejoining Thermax as General Manager in 1997, he became a member of the Executive Council in 2000. He also led the company's project business as Group Business Head before being elevated as the Managing Director & CEO in 2007.

Mr. Unnikrishnan is known for his strategic and human relations skills and is a champion of green technologies.



**Mr. Debasish Mallick,
Deputy Managing Director , Export-Import Bank of India**

Mr. Debasish Mallick has been appointed by the Government of India as Deputy Managing Director of Export-Import Bank of India w.e.f 21st July 2014. Prior to this appointment, Mr. Mallick was the Managing Director and CEO of IDBI Asset Management Company Ltd.

A post graduate In Economics from Jadavpur University, Kolkata and a Certified Associate of Indian Institute of Bankers, Mr. Mallick has nearly three decades of experience in the Banking Industry. Immediately prior to joining the IDBI Asset Management Company Ltd., he was head of Personal Banking Business for IDBI Bank Ltd. (West Zone) which included distribution of Mutual Fund products. Mr. Mallick has long experience in the areas of Corporate Banking, International Banking, Resource Mobilization and Treasury among others. The responsibilities in Exim Bank include Corporate Banking, Overseas Investment Finance, and Export Credit among



**Mr. K Nandakumar ,
CMD , Chemtrols Industries Limited**

Mr. K. Nandakumar is the Founder and Managing Director of the Chemtrols Group. Started in 1975, Chemtrols is one of India's leading solutions provider in process analytics, petroleum terminal automation, environment monitoring, process measurements, steam conditioning solutions and electricity distribution management.

A Chemical Engineer (B. Chem. Engg) with specialization in petroleum refining from the batch of 1970 – University of Kerala, Mr. Nandakumar worked in Cochin Refineries and FACT (Fertilizers & Chemicals Travancore Ltd.) before embarking on his entrepreneurial venture – Chemtrols.

In his highly successful career spanning over 4 decades, he has worked in functions as diverse as refinery operations, process engineering, project management, sales and marketing, strategic planning, business development, finance and corporate management.

Over the years, Mr. Nandakumar expanded Chemtrols and incorporated several diversified and joint venture companies. Today the Chemtrols Group comprises several companies at various stages of their growth trajectory, moving at an accelerated pace towards great success.

Mr. Nandakumar is today, a very respected and renowned figure in the field of Chemical Process Engineering and Process Automation. The major Associations where he is associated, in various capacities include –

- Chairman of the Instrumentation and Automation Division of CII
- Director of the Process Plant Manufacturer's Association (PPMAI)
- Member of the CII MSME National Council
- Chairman – CII (WR) SME Sub-committee
- Member : Governing Council : Capital Goods Skill Council : NSDC
- Member of Capital Goods Committee of FICCI
- Member of the American Institute of Chemical Engineers, since 1981.



Mr. Subramaniam Vutha , Advocate , Former Senior Vice President-Legal of Tata Infotech Ltd. [earlier Tata Unisys Ltd.]

Mr. Subramaniam Vutha is an advocate by training. He is a former Senior Vice President-Legal of Tata Infotech Ltd. (earlier Tata Unisys Ltd.) and of Schoolnet India Limited. His areas of expertise include Information Technology Laws, Intellectual Property Rights, and E-Commerce Laws.

Mr. Vutha has work experience of 25 years with leading organizations, including the Indian subsidiary of Monsanto Chemicals and the joint venture of Unisys Corporation, USA. He had experience with the TATA group and 11 years of independent practice doing specialized work in the areas of Corporate IPR Frameworks through the complete value chain from development and implementation of IP strategies/policies, processes and roadmaps.

Committees/Affiliations :

- Member, International Technology Law Association, a worldwide body of technology lawyers
- Past President & former Member of the Board, Licensing Executives Society, India,
- First member of LES India to attend a Train-the-Trainer Program [at Tokyo] on Intellectual Asset Management, conducted by LES International
- Advisory Board Member, BNA International Inc., London's earlier publication titled World Internet Law Report
- Lecturer on IT Laws at the University of Mumbai's Department of Law, for LLM students
- Former Member, Working Group on TRIPS, Confederation of Indian Industries
- Former Co-Chairman, WTO & Intellectual Property Rights Committee of the Bombay Chamber of Commerce & Industry
- Member of an erstwhile Legal Advisory Group constituted by the Controller of Certifying Authorities, Ministry of Information Technology, Government of India
- Member of the in-house counsel panel constituted by the erstwhile World e Business Law Report, London.
- Founder member of the Technology Law Forum, a forum dedicated to Building Bridges between Technology and the Law



Mr. Rajrishi Singhal, Senior Fellow consultant and policy analyst with Gateway House, Former executive editor, Economic Times

Mr. Rajrishi Singhal is Senior Fellow at Mumbai-based think tank, Gateway House. He has been a senior business journalist, and Executive Editor, The Economic Times, and served as Head, Policy and Research, at a private sector bank, before shifting to consultancy and policy analysis. In his extensive journalistic career, he has written at length on the Indian economy, banking and finance industry, and on numerous public policy issues, apart from tracking areas such as steel, coal,

shipping, ports, petroleum, petrochemicals, textiles and corporate performance. He has been the recipient of two prestigious fellowships – the Gurukul Chevening Fellowship at the London School of Economics (1997-1998), and the C. V. Starr Fellowship at the Centre for Advanced Study of India, University of Pennsylvania (2002). Rajrishi has also served on two government committees appointed to re-examine policy options in areas of financial services, such as pension sector reforms. He has been a regular Op-Ed contributor to various leading publications, such as The Economic Times, Hindu BusinessLine, scroll.in, Business Standard, among others. He has a Master's degree in Economics from Jadavpur University, Kolkata²

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About Us

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Mumbai Branch

HISTORY OF JADAVPUR UNIVERSITY AND ITS ALUMNI ASSOCIATION

In the unprecedented public indignation that arose as a result of the attempted partition of Bengal in 1905 by the then British rulers, the nation realized that an educational system based on national ideals was essential for the regeneration of a nation. As a consequence the National Council of Education, Bengal (NCE BENGAL) was founded on 11th March, 1906 by eminent nationalist leaders of the time. Some of the objects of the National Council were

- To impart education - literary, scientific and technical - in national lines and exclusively under national control, not in opposition to, but standing apart from the existing system of officially controlled education at all levels.... and to inspire students with a genuine love for and a real desire to serve the country.
- To promote moral and physical education.
- To promote education through the medium of the mother tongue of the students.
- To maintain high standards, educational, intellectual and moral, amongst the teachers and arrange suitable training for the purpose.

The Bengal National College was established on 15th August 1906 for teaching science and humanities. The Bengal Technical Institute founded by a different body, the Society for the Promotion of Technical Education on 7th July, 1910 and was merged soon afterwards with the National Council of Education. The two colleges were virtually the faculties of "Humanities and Science" and of "Technology" of the National Council of Education. Several national schools also were founded in this period at different places in Bengal.

By 1920 many batches of graduates from the national institutions were out and established in life. A movement was spearheaded by some of the ex-students to establish an Association of the Alumni of the National Council of Education. A conference was convened at the initiative of half a dozen enthusiasts which was attended by some sixty more. The "Jatiya Shiksha Parishad Chhatrasangha (NCE Alumni Association)" was formed on 1st January, 1921 with Abinash Chandra Bhattacharya as president and Hiralal Roy and Upendra Chandra Ghosh as Secretaries.

From then on, the history of the Association and its Alma Mater are closely intertwined. With the Calcutta Corporation granting a piece of land at Jadavpur and with liberal donations from benefactors, the National Council and the College moved to its present campus in 1924, and the Association moved with it. The Technical Institute grew and was renamed as the College of Engineering and Technology.

The Alumni served the National Council by every means possible. Working for meager or no compensation donating money, collecting donations, working long hours, they virtually carried the institution on their shoulders during this period. They could also arrange, during this period, to finance the training of a number of faculty members overseas to keep in touch with the latest technological developments. Though deprived of Government recognition or patronage, or perhaps on account of it, the Alumni of the period grew with a fierce spirit of independence, and established themselves in various industries, creating some of them from scratch.

By the end of the thirties, war clouds hovered over

the western world and a little later it was evident that the Orient also would not be spared from its ravages. Though the British Government did not formally recognize the National Council, de facto their Alumni were absorbed in large numbers in defence related and other industrial jobs. Furthermore, as the war effort of the Government required large numbers of technically trained personnel, the National Council also was encouraged to increase its training capacity and money grants were forthcoming for the purpose. With the attainment of political freedom of the country, the picture changed altogether. Financial worries were gradually reduced, finally culminating in the enactment that brought the Jadavpur University into existence on 24th December 1955. The National Council of Education, in a bold and noble gesture gave away everything it had to the newly founded Jadavpur University and started afresh with its professed objective of pursuing the cause of National education.

Today this oldest Alumni Association in India is known as ALUMNI ASSOCIATION, NCE BENGAL AND JADAVPUR UNIVERSITY. It is only in Jadavpur University, that one finds a building in the heart of the campus as the Alumni Association building.

One of the main aims of the Alumni Association is to foster brotherhood among the past students of the Jadavpur university. With this spirit, one can find branches of the Jadavpur University Alumni Association not only in India, but also in many places abroad.

ALUMNI ASSOCIATION, NCE BENGAL AND JADAVPUR UNIVERSITY MUMBAI BRANCH

In Mumbai, the branch of our Alumni Association was formed in the year 1956. The love and affection of many senior members for the cause of Alumni Association are our inspirations for the activities of our Branch. The Mumbai branch of our Association now has many young and senior members. These young and senior members are participating actively to achieve excellence in the Alumni movement. It is hoped that the tradition of the Mumbai Branch of the Alumni Association, NCE Bengal, Jadavpur

University will continue from generation to generation.

The objectives of Mumbai Branch of Alumni Association

1. To foster a spirit of comradeship, to promote co-operation and mutual help amongst the ex-students of the National Council of Education (N.C.E.), Bengal and Jadavpur University.
2. To foster the growth of healthy fellow-feeling, to promote common interest and to maintain a feeling of unity amongst them.
3. To keep the Association in touch with the National Council of Education, Bengal and the Jadavpur University as far as practicable and to render all possible help to the said institutions in their endeavours and objects. The same shall be extended to Main association and its all other branches.
4. To organise and develop the activities of the ex-students of the National Council of Education and the Jadavpur University as far as practicable on matters such as social, economic, educational and philanthropic.
5. To promote the moral, material and industrial progress of Mumbai in particular and India in general.
6. To protect the interest of the ex-students of the said institutions on such matters as may concern them.
7. To act for and represent the ex-students of the said institutions in all public affairs, wherever necessary.
8. To co-operate with other persons and institutions in attaining the above objects or any of them; and to help any other institutions or movements having for their objects the spreading of National Education on lines similar to those of National Council of Education.
9. To publish News Bulletins, Monographs, Books, leaflets or articles to enhance academic awareness of members and the general public

and to keep members informed of the activities of the Association.

10. To help the needy and poor students in distress.
11. To arrange for debates, lectures, workshops, seminars and conferences to enhance, diffusion of knowledge amongst students, ex-students, faculty members and the general public.
12. To support and encourage entrepreneurship to the members through web services or otherwise and create forum for the same.
13. To purchase, take on lease or in exchange or otherwise acquire any moveable or immovable property of any description of any rights and privileges and to sell, mortgage, lease, exchange or otherwise dispose off or deal with all or any of the properties belonging to the Association.
14. To purchase, or otherwise acquire, build, construct, establish, maintain, reconstruct, equip, alter any buildings, offices, workshops, plants, machinery and other things convenient for all or any of the objects of the Association.
15. To contribute, from time to time, to any charitable, benevolent or useful subject of a public character, the support of which will, in the opinion of the Association, promote all its objects or any of them.
16. To amalgamate with any other institution, society, association or body having objects wholly or partially similar to those of this Association.
17. Generally to do or perform all such other acts and things as may be necessary or conducive to the attainment of all, or any of the above objects or in any way incidental thereto.
18. For diffusion of knowledge, persons of eminence may be called for with suitable honorarium.

Jadavpur University Alumni Association (Mumbai Branch) Trust

Mumbai branch has formed a trust in the name of "Jadavpur University, Alumni Association (Mumbai Branch) Trust" which is registered under the

Society registration Act, 1860 (Act xxi of 1860) and Bombay Public Trust Act 1950.

Trust is involved in sponsoring many scholarships to meritorious / poor students in many academic institutions in Mumbai and Jadavpur University.

Objectives of the Trust

The objectives for which the Trust is established are :

- 1 To give aids to deserving students for pursuing further studies in engineering , applied science or research work irrespective of religion, race, community, caste, language or social status.
- 2 To give subsidy to the meritorious or needy students in the form of scholarships to cover School/College fees and tuition fees for a complete year or part of the year.
- 3 To provide financial help for accommodations, maintenance and purchase of books and instruments to deserving students .
- 4 To organise honoraria to prominent persons for delivering lectures in India with a view to extending the frontiers of knowledge.
- 5 To print, publish, issue and exhibit any journals, periodicals, books, papers, advertisements, pamphlets, reports, lectures, and other reading materials for the diffusion of and for the promotion, benefit and advancement of education.

Names of our present board of Trustees :

Amal Kumar Basu
Rajat K Dasgupta
Ashok Adhikary
Shyamapada Ray
Cdr. Sushanta Kumar Jana
(Managing trustee)
M N Saha
Sushobhan Dutta
Gora Chakraborty
Kunal Sengupta
Prof. Amal shankar Roy
Sukumar Pramanik
Sumit Bardhan



EXECUTIVE & SEMINAR COMMITTEE

Alumni Association N.C.E Bengal & Jadavpur University
(Mumbai Branch)

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Mr Dibyendu Chakraborty - Vice President	Mr Rudranath Banerjee - Hon Secretary
Mr Arindam Bhattacharya - Joint Secretary	Ms Madhumita Ghosh - Member
Mr Pranab Mukherjee - Member	Mrs Rumu Haldar - Member
Mr Anjan Chatterjee - Hon. Treasurer	Mr Surajit Malladev - Member
Mr Sukumar Pramanik - Member	Mr Meghdut Manna - Member
Mr Kunal Sengupta - Member	Mr Kumar Rudra - Member

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Mr D P Misra	Mr Abhijit Bhattacharya
Mr Ramani Iyer	Mr Kumar Rudra
Mr S P Ray	Mr Ashok Adhikary
Mrs. Pampa Sengupta	

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Mr Anup K Ghosh - Asst Editor	Mr Ashok Adhikary
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Mr Bishnupada Bhattacharya	Mr S Kanjilal
Mr Debasish Mallick	

From the President's Desk



Sumit Bardhan

Alumni Association of Jadavpur University, Mumbai Branch has a rich heritage of organising seminars on many contemporary subjects over the years. When we were deliberating on this year's topic, the question which struck us was why among so many important issues, manufacturing should be focused as a priority for India in the next few years.

The answer was not easy. India had targeted agriculture as a priority over the last few decades, for obvious reasons, to feed her people. But the country having reached almost self-sufficiency in food grains, we need to look beyond the horizon. From microchips to military hardware, India largely depends on imports. Today every next car, washing machine, television set etc. in India is of foreign brand, assembled in India. This means that major part of the cost we pay, goes to the parent country from where the parts are sourced.

Going by the "Make in India" phrase, just think of the situation, if the components were manufactured in India, the things would have been cheaper, forex drain would have been restricted and large job opportunity would have been created for the people.

Most of the leading economies of the world are also major manufacturers, who have export figures much higher than imports.

In order that India focuses towards a manufacturing major, many related issues need to be addressed both by the Government and also by other stakeholders.

This seminar shall focus towards the areas of improvement, infrastructure and the policy decisions which we need to relook into so that the largest democracy can turn around to become the manufacturing giant of tomorrow.

Warm Regards,

Sumit Bardhan
President, JUAAM
1991, Civil

Secretary's Report



Rudranath Banerjee

Alumni Association, NCE Bengal & Jadavpur University, Mumbai Branch will be completing 57 years of its existence in Mumbai. It was founded in the year 1956.

You may be aware that our glorious existence over more than past five decades been made possible because of sincere and passionate activities of our members irrespective of age.

The activities of our association always involve events that help knit alumni fraternity even closer year after year, while addressing the social needs that we recognize and imperative to be addressed. Thus, our efforts include social and cultural events, social welfare by way of direct assistance to the needy, as well as organizing seminars & conference to address contemporary issues that demand greater attention.

All the above activities generate funds through cultural event sponsorship, advertisements on souvenir, donation from alumni & seminar sponsorship.

In recent years, as responsible leaders in the industry, we are appalled to watch the sorry state of affairs in the corporate world that shows lack of ethics, bankrupt management philosophy and disproportionate greed. This indeed calls for greater attention to improve upon every possible areas of the larger ecosystem of corporate houses.

Our association is organizing a National Seminar on the theme "India as a Global manufacturing Hub by 2022, Panacea to our aspiration" on 18th January 2015.

The excess fund which we have generated every year donated to the trust formed by the association. The trust has been registered under the Societies Registration Act 1860 (ACT XXI of 1860) and Bombay Public Trust Act 1950 (Registration No. F-6172 (Bom) & Bom/318-80).

Our Alumni Association tries to promote education among meritorious but economically challenged students by awarding scholarships to the needy students both in Mumbai and in our Alma mater, Jadavpur University, Kolkata. This gesture encourages the deserving students to continue their education and also pursue higher studies. We also provide financial assistance to members and their families to bear expensive medical treatment on case to case basis and on critical situation.

The source of inspiration for the growth of our beloved association has always been a strong sense of camaraderie among the members, coupled with a strong zeal and innovative concepts to help stay relevant. We sincerely believe that our association will carry on with her social obligations and the great tradition will continue to go on for great many generations.

Rudranath Banerjee
1993 CMI



JADAVPUR UNIVERSITY ALUMNI ASSOCIATION (MUMBAI BRANCH) TRUST

(Regn. No. BOM / 318-80 under Registrar of Societies Act 1860 and
Regn. No. F- 6172 (BOM) under The Bombay Public Trust Act 1950)

C/o Mr. Ashok Adhikary,

403, Nirmal, A-2/9, Gokuldham, Goregaon (E), Mumbai - 400 063.

Tel. 2840 0082 E-mail : akadhikary@gmail.com

Managing Trustee's Report

Commandar Sushanta Kumar Jana. (Retd). I.N



Alumni Association, N.C.E Bengal & Jadavpur University (Mumbai Branch) first saw the bright light of this earth in the year 1956. It has grown over the last 59 years to have in excess of 300 active members connected with various core and knowledge based industries, professional organisations, and Government agencies in and around Mumbai.

After a few years, a thought came into the mind of these enthusiastic and service oriented members of the Alumni Association NCE Bengal & Jadavpur University (Mumbai Branch), to give something back to the society. They decided to work for upliftment of this society, the same society which has given them so much and dignity in life. They planned to devise some ways and means to support bright and needy students and encourage a movement for education. This thought definitely needed a backing of financial strength. This strong urge to do something for the society gave rise to a TRUST, in the year 1980, with the prime objective to extend financial support to meritorious, mentally challenged and needy students in Mumbai and to its alma matter, Jadavpur University. This TRUST was named "Jadavpur University, Alumni Association (Mumbai Branch) Trust". It is a registered body under the Societies Registration Act 1860 (Act XXI of 1860) and Bombay Public Trust Act 1950 (Registration No F-6172 (Bom) & Bom 318-80). This TRUST is also approved by the Charity Commissioner of Maharashtra.



Late Mihir R Lodh scholarship being handed over to Vivekananda Education Society for adopting 5 deserving school children.



Late Sushil Kumar Ganguly scholarship given to needy students of standard 1 to 4 from Jadavpur Vidyapith in presence of local Alumni members.

The Board of Trustees meet every quarter to fulfil its statutory requirements. For last one year they met 5 times on 15-12-2013, 30-03-2014, 06-07-2014, 21-09-2014 and 14-12-2014 to transact all matters and monitor the Trust's functions. The AGM was held on 14 June 2014. In this AGM various amendments in MOA were discussed, analysed, finalised and adopted to update and to suit the current need of the hour. The same is also submitted through proper formats to the Charity Commissioner's office for record.

Following Scholarships are Awarded Every Year.

Sr. No.	Scholarship	Beneficiaries	Amount (Rs)
1	Late Anil K Sinha	Sashi Managalayam	2 X 7,000 = 14,000
2	Late Sushil K Gangull	Jadavpur Vidyapith	4 X 8,000 = 32,000
3	Late B C Rajshil	Jadavpur Vidyapith	1 x 25,000 = 25,000
4	Late Mihir R Lodh	Vivekananda Edu. Society.	5 X 9,000 = 45,000
5	Late Supriya Basu	Jadavpur University	4 X 20,000 = 80,000
6	Late R K Debnath	Sausheelya	20,000
7	Late C K Radhakrishnan	VJTI	20,000
Total			2,36,000

The Trust has built up a corpus of Rs 40 lakhs so far, which is routinely invested in FDs / RBI Bonds / saving Bank Deposits in scheduled commercial Banks as approved by the Charity Commissioner and earn interest which is used for distribution of scholarships.

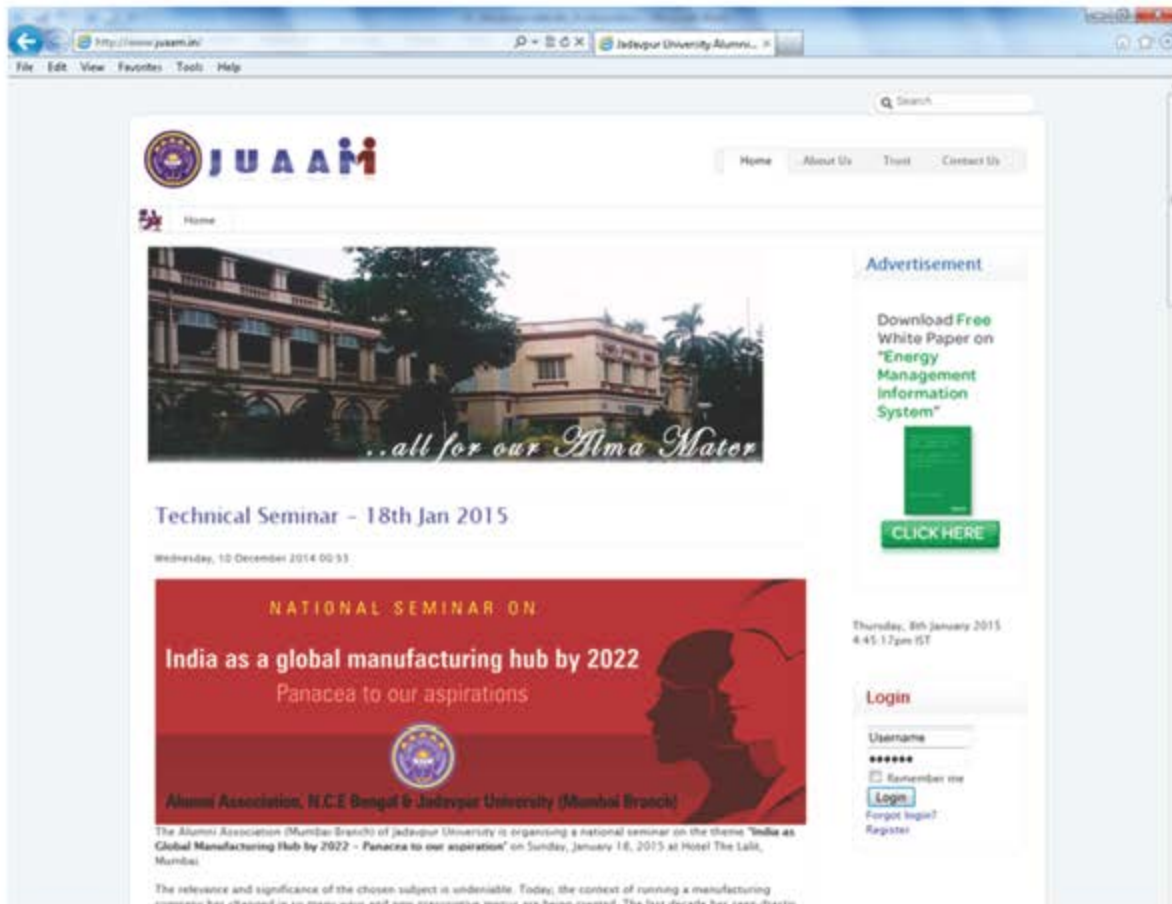
Coming together is a beginning; keeping together is progress and working together is success. It's when we start working together that the real healing takes place. It's when we start spilling our sweat, and not our blood. We therefore appeal to all alumni members and like minded persons for their active involvement and whole hearted support to the Alumni and the Trust for this noble cause.

The donation may be directly deposited in TRUST savings account no. 1207000100274905 in Punjab National Bank, Anushakti Nagar, Mumbai-400094 (IFS Code :PUNB0120700). Cheque payment may also be made and it should be payable to 'Jadavpur University Alumni Association (Mumbai Branch) Trust' by sending to the official address as well as to our treasurer : I - 203, Magnolia Enclave, Nahar Amrit Shakti, Near Chandivali Studio, Powai, Mumbai-400072, with intimation to the treasurer Mr. Sushobhan Dutta on 022-25995510 (during working hours) / 9324523075 (during non-working hours). Please come forward and be a part of this objective of serving the society. A sustainable world means working together to create prosperity for all. " Working together always works " .

Thank you.

ABOUT OUR NEW WEBSITE

www.juaam.in



All existing members are requested to log in and navigate further. Should they have any problem in logging-in such as forgotten user ID or password, they can use the applicable "forgot login" section. New members can register afresh to start with.



Our visit on 29th April 2014 to ShashiMangalyam School for Mentally Retarded, Goregaon(E), Mumbai, Maharashtra, where our Trust donates regularly .



Board of Trustees meeting on Dec 14th 2014



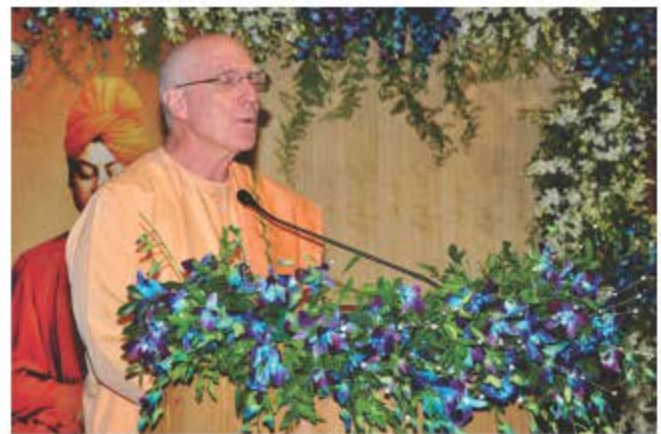
Concluding seminar on Feb 1st and 2nd 2014 to commemorate 150th birth anniversary of Swami Vivekananda. Mr. R Gopalakrishnan (Director of Tata Sons) & Swami Sarvalokanandaji Maharaj (president , Ramakrishna Math-Khar) Inaugurating the seminar.



Section of audience during the seminar on Feb 1st and 2nd 2014. Our Alumni was associated with the seminar for theme management.



Seminar session on "Fostering Global peace - Swami Vivekananda's dream" organised on Feb 1st & 2nd 2014.



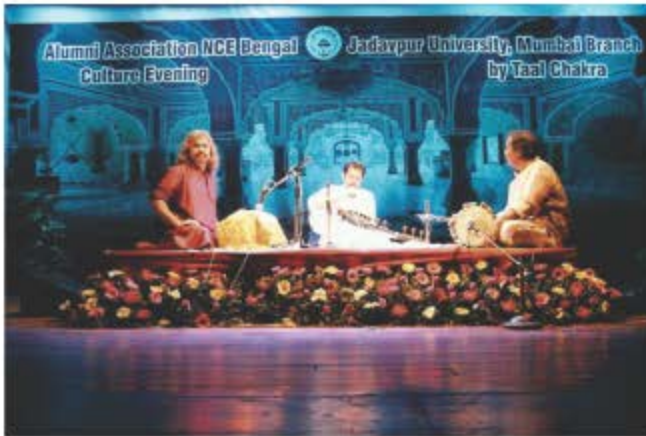
Swami Atmarupanandaji Maharaj talking on Global peace



**Seminar on Feb 1st and 2nd 2014 :
Session on progress**



**Cultural Programme on 7th April 2012 :
Swami Sarvalokanandaji Maharaj
Inaugurating the function**



**Cultural Programme on 7th April 2012 :
Pt. Aman Ali Khan playing Sarod**



**Cultural Programme on 7th April 2012 :
performance by Kaushiki Chakraborty
and Pt. Vijay Ghate**



**Picnic on 19th Jan 2014 at Goral Beach :
Away from the corporate world**



**Picnic on 19th Jan 2014 at Goral Beach :
Let us relax**



**Picnic on 19th Jan 2014 at Goral Beach :
Sea, Sun, sand and Sip**



From old file : members after the Trust meeting



**Members after the get together hosted by
senior alumnus Mr. Shyamal Gupta on
Sept 7th 2014 at P V M Gymkhana , Nariman Point**



**AGM held on June 14 th 2014
at Maheshree Club, JVLR**



**Interactive workshop on Career Growth Plan was organised
by Mr. Shyamal Gupta, Special Advisor, Tata International Ltd
on 20th Sept 2014 at Tata International Limited offices, Mumbai**



**We have a point : Snapshot of
Executive Committee meeting on Dec 14th 2014**



**Picnic on Jan 4th 2015 at
Mumbappa farm- Virar-Vajreswari road**



Picnic on Jan 4th 2015 : In search of passion



**Picnic on Jan 4th 2015 :
Earth , Energy and Experiment**



Picnic on Jan 4th 2015 : "Men can cook" day



Picnic on Jan 4th 2015 : Colours everywhere



Picnic on Jan 4th 2015 : We dream, we sing

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NCE Bengal and Jadavpur University, Mumbai Branch

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Year	Presidents		Hon. Secretaries	
1956	Shri Birendra Nath Sen	14Ch	Shri Akshoy P. Dutta Choudhary	51M
1957	Shri Birendra Nath Sen	14Ch	Shri Akshoy P. Dutta Choudhary	51M
1958	Shri Birendra Nath Sen	14Ch	Shri Akshoy P. Dutta Choudhary	51M
1959	Shri Birendra Nath Sen	14Ch	Shri Akshoy P. Dutta Choudhary	51M
1960	Shri Birendra Nath Sen	14Ch	Shri Supriya K. Basu	56M
1961	Shri Sarojendra Nath Guha	26 E	Shri Supriya K. Basu	56M
1962	Shri Sarojendra Nath Guha	26 E	Shri Supriya K. Basu	56M
1963	Shri B. S. Mehra	19M	Shri Supriya K. Basu	56M
1964	Shri S. K. Ganguli	46M	Shri Supriya K. Basu	56M
1965	Shri B.C. Rakshit	23E	Shri Supriya K. Basu	56M
1966	Shri B.C. Rakshit	23E	Shri M. K. Saha	59M
1967	Shri M. R. Lodh	47Ch	Shri R. Debnath	61Ch
1968	Shri M. R. Lodh	47Ch	Shri R. Debnath	61Ch
1969	Shri S. Dutta	52E	Shri B. Bhattacharya	70M
1970	Shri S. Dutta	52E	Shri Gora Chakraborty	67E
1971	Shri Supriya K. Basu	56M	Shri Gora Chakraborty	67E
1972	Shri A. k. Sinha	49M	Shri C. K. Radhakrishnan	58M
1973	Shri T. K. Bose	53E	Shri R. Debnath	61Ch
1974	Shri G. N. Ghosh	52M	Shri R. Debnath	61Ch
1975	Shri G. N. Ghosh	52M	Shri B. Bhattacharya	70M
1976	Shri A. K. Basu	46Ch	Shri A. K. Adhikary	70E
1977	Shri A. K. Basu	46Ch	Shri A. K. Adhikary	70E
1978	Shri R. Dutta (Resigned)	51M	Shri P. Gangopadhyay (Resigned)	75M
	Shri G. M. Saha	52E	Shri R. Debnath	61 Ch
1979	Shri G. M. Saha	52E	Shri D. Guin	77E
1980	Shri Supriya K. Basu	56M	Shri P. Majumdar	58E
1981	Shri Supriya K. Basu	56M	Shri P. Majumdar	58E
1982	Shri Dipen Ghosh	52Ch	Shri P. Majumdar	58E
1983	Shri Dipen Ghosh	52Ch	Shri P. Majumdar	58E
1984	Shri C. K. Radhakrishnan	58M	Shri Alope Biswas	76M
1985	Shri C. K. Radhakrishnan	58M	Shri S. Pramanik	81IEE
1986	Shri A. R. Trivedi	61 Ch	Shri A. K. Bera	83Ch
1987	Shri A. R. Trivedi	61 Ch	Shri A. K. Bera	83Ch
1988	Shri R. Debnath	61 Ch	Shri P. Mukhopadhyay	84M
	Shri Gora Chakraborti	67E		
1989	Shri Gora Chakraborti	67E	Shri A. Das	87IEE
1990	Shri B. Bhattacharya	70M	Shri A. Das	87IEE
1991	Shri B. Bhattacharya	70M	Shri P. K. Das	87IEE

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Year	Presidents		Hon. Secretaries	
1982	Shri Vishnu Prasad	59E	Shri P. K. Das	87 IEE
1993	Shri Vishnu Prasad	59E	Shri S.Kanjilal	77 M
1994	Shri Swapan K. Ghosh	68M	Shri S.Kanjilal	77 M
1995	Shri Ashok K. Adhikary	70E	Shri S. Pramanik	81 IEE
1996	Shri Ashok K. Adhikary	70E	Shri S. Pramanik	81 IEE
1997	Shri S. K. Bandopadhyay	70Ch	Shri Dibyendu Chakraborty	91M
1998	Shri S. K. Bandopadhyay	70Ch	Shri Dibyendu Chakraborty	91M
1999	Shri S. P. Ray	71IEE	Shri K. Sengupta	76Ch
2000	Shri S. P. Ray	71IEE	Shri K. Sengupta	78Ch
2001	Shri R. K. Dasgupta	59M	Shri Dibyendu Chakraborty	91M
2002	Shri R. K. Dasgupta	59M	Shri Dibyendu Chakraborty	91M
2003	Shri D. P. Misra	64Ch	Shri A. Bardhan	90M
2004	Shri D. P. Misra	64Ch	Shri A. Bardhan	90M
2005	Shri A. Chatterjee	72Met	Shri M. Kumar	99IEE
2006	Shri A. Chatterjee	72Met	Ms. Shukla Nag	73Comp
2007	Shri . M. N. Saha	74IEE	Shri Debashis Sur Roy	2006 IEE
2008	Shri . M. N. Saha	74IEE	Shri Debashis Sur Roy	2008 IEE
2009	Shri S. Pramanik	81IEE	Shri Meghdut Manna	98IEE
2010	Shri S. Pramanik	81IEE	Shri Meghdut Manna	98IEE
2011	Shri Kunal Sengupta	76 Ch	Shri Rudranath Banerjee	93 CMI
2012	Shri Kunal Sengupta	76 Ch	Shri Rudranath Banerjee	93 CMI
2013	Shri Sumit Bardhan	91 Civil	Shri Rudranath Banerjee	93 CMI
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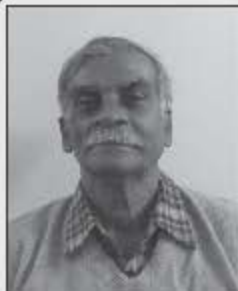
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“MAKE IN INDIA”, A Thrust Worth Pursuing

By : Bishnupada Bhattacharya



Mr. Bishnupada Bhattacharya is a graduate in mechanical engineering from Jadavpur University, Kolkata in 1970. He performed course work for Ph.D in power plant simulation for I.I.T Bombay in 1988 and was part-time lecturer in mechanical engineering in Venezuela, from 1978 to 1982.

He worked with Development Consultants Pvt Ltd, a consultancy organization, from 1971 to 1997 in various capacities in India and abroad on Nuclear and fossil fuelled power plant. Subsequently, he joined Thermax Ltd Pune in 1998 and formally retired in 2008 as GM engineering. Presently he is continuing with Thermax power plant division as HOD engineering as a post retirement assignment.

His interest outside profession includes studying Indian heritage texts and he completed M.A in Sanskrit from Pune University in 2010. He has also authored several articles on Indian heritage texts.

I read in some book on THE HISTORY OF ANCIENT WORLD, “when the Egyptians were busy in making pyramids, the Romans constructing Colosseum, the Indians were engaging themselves in writing the Upanishadas”. I thought that this was following the law of natural justice. Though ancient India has also the credit for constructing Ellora temple and Khajuraho sculptures, it is the intellectual discourse which gives Indians their distinctive feature. This observation is contrary to the present thrust of “make in India” movement.

It is a fact that manufacturing industries in India are far behind not only of those of the developed countries, but also behind the manufacturing capability of some countries of the developing world. It is a common trend these days to draw comparison between India and China almost on all subjects. At this moment it is an obvious fact that China's manufacturing capability is way ahead compared to that in India. A special mention can be made in this connection about the electronic field, where almost every possible brand has manufacturing facility in China, whereas India has got hardly any.

The story may be different when we compare the development of software. India may have an edge over China in the field of software. This also corroborates the fact that the inherent capability of India is to think,

not to act.

It was early 1970s when I had the first glimpse of industrial scenario in the country in power plant sector. A leading Indian giant in the field had a claim of manufacturing turbine, generator pumps, condensers, heaters and many other auxiliaries for fossil and nuclear power plant. It took some time for me to realize that many components of the turbine and its auxiliaries are not made by this industry house. They are brought from outside India. They are simply processed and assembled by them. Today, after more than four decades, I do not have an exact estimate as how much of the power plant equipment/components are still being imported by the same company. But I am sure that over the years expertise has definitely been acquired.

The scenario must have been same in many other sectors like steel, cement, mining and of course in electronic industries. In automotive industry such imported components may be less. Over the years efforts have been made by various industry houses, but success rate is far from satisfactory.

With such background we can view the theme of “make in India” to convert India as a prominent manufacturing hub for the world within next ten years. What could be the major hurdles or impediments to achieve this goal? In other words what needs to be

done to make it happen, whether it can be done at all? Though I have my doubts about the success in this effort because of our inherent characteristics, I would like to put stress in four areas to improve the situation.

- Improve the availability of raw materials for various finished products currently being made/ assembled in the country. Amongst other things, this will call for long term investment in metallurgical research, both ferrous and nonferrous. This is also required for chemical and pharmaceutical area to promote manufacturing capability for photovoltaic cells, membrane for reverse osmosis technology and making nano technology to address the requirement of a pollution free environment.
- Keeping in view the need for electronic industries, promote micro precision manufacturing capability

by specialized intense training.

- Provide all help to establish small scale industry all across the country, so that they can serve all big scale industries in and outside India.
- Last but not the least; create an absolutely honest sincere and quality conscious work force. This is perhaps the most important requirement for attracting outside investors in India.

I started this write up saying generally Indians are better thinkers than doers. I still believe in it. But I also believe that only thinking does not provide us the bread, it has to be made. Therefore our efforts for augmenting our manufacturing capability and there by supporting the movement for “make in India” shall be on and all out.

Did you know

Solar rays can directly evaporate water into steam and this steam can run power generating turbine. Why is it not popular then? Why do we install photovoltaic cells to convert sunlight into electricity?

The main problem is that harnessing enough solar energy to put steam to work is hard, inefficient and costly. Existing solar-power plants use vast arrays of movable mirrors, or heliostats, to track the sun through the day and concentrate its energy more than 1,000 times onto a “receiver” that generates steam to drive turbines. In spite of all such effort, the efficiency is still in the range of 24%.

Now a group of researchers at the Massachusetts Institute of Technology (MIT) has come up with an alternative approach that borrows from the natural evaporation of earth’s surface or lakes. Steam is generated at the surface of water, but the mass of liquid below acts as a heat-sink that conspires against steam

generation. The MIT researchers sought to address this in a laboratory set-up that consists of a double-layered black disc floating on the surface of water in an insulated beaker. The resulting “exfoliated” graphite forms a 5mm-thick porous matrix that absorbs and concentrates the heat from sunshine. The lower layer is a 10mm-thick porous carbon foam that floats on the water and prevents the heat in the top layer from being lost to the water below.

This simple disc turns out to be a very efficient steam generator. For one thing, it produces steam when sunlight is magnified by a factor of just ten. This requires little more than cheap lenses and it increases the efficiency of using solar energy to make steam to 85%.

For further reading :

Solar Energy : Picking up the steam, The Economist, Aug 2nd 2014.

"COME! MAKE IN INDIA" INITIATIVE OF PRIME MINISTER OF INDIA

- Rajat K. Dasgupta



Mr. Rajat Kumar Dasgupta is a graduate in Mechanical Engineering from Jadavpur University and a post-graduate in Industrial Engineering and Operation Research from I.I.T.-Kharagpur.

His 55 years of experience includes 25 years with Engineers India Ltd, superannuating as Director Commercial followed by 12 yrs. with U.S. multinational- Chemtex Global Engineers Pvt Ltd as President and CEO; besides Head- Business Development with Mott McDonald for five years.

His area of expertise covers, Project conceptualisation in areas of hydrocarbon processing and oil and gas industries, Project Management and Controls, Project Implementation, Project Procurement and constructions.

Lately Mr. Dasgupta devoted himself mostly with Strategic Business Planning for Start-Up companies, Marketing and Business Development for Projects encompassing Oil Refining, Upstream of Oil and Gas, Gas Processing, Petrochemical Complexes, Mineral Processing including Aluminium Smelters in India and overseas.

Currently he is engaged with Indiana Group of Companies as Chief consultant for its strategic growth and corporate planning & Chief marketing adviser. He is also part time Board member of several Indian companies such as Paramount India Ltd, Swan Energy Ltd,

The stirring Independence Day address on 15th August 2014 from the ramparts of the Red Fort by Prime Minister Sri Narendra Modi is an emphatic reflection of the aspirations of millions of Indian youth who desire India to be a manufacturing hub which would lead to faster economic growth and hence to more job opportunities. With this vision in mind, the Prime Minister made an earnest appeal to domestic as well as global investors to boost up the present dwindling manufacturing base in India.

There are clear signs of world's economy undergoing drastic change. India will have to change and act accordingly. The Prime Minister must be commended for stating clearly that his government's policy is to encourage foreign investments which will boost up domestic manufacturing leading to employment opportunities for the youth in India. If India is to balance between imports and exports, the manufacturing sector will have to be strengthened. If India has to put into effective use the capabilities of the educated youth, we need to focus on the manufacturing sector. The Prime Minister's clarion call to the global investors –

"Come! Make in India. Come! Manufacture in India. Sell in any country of the world, but manufacture here in India. Be it plastic or paper, electric or electronics, automobiles or agriculture, submarines or satellites – come! Make in India"

is a clear indication of a paradigm shift in priorities of the Government and the drastic reforms in the pipeline in order to promote manufacturing sector and facilitate India becoming globally competitive. It is reasonable to expect that such steps by the government will transform India into an international manufacturing hub providing serious competition to China. "Come! Make in India" initiative can be regarded as the first step towards introducing policy changes in this important area. However, to realize this goal, labour reforms, policy on formation of special economic zones, investor friendly foreign direct investment rules, new taxation policy and most importantly, land acquisition policies are very critical. Though India had missed the bus, the country can make significant impact on the global manufacturing sector through innovations and cost reduction. Currently, manufacturing in India contributes to less than 17 percent of GDP, while in China it is almost 60 percent of GDP and in Malaysia it is nearly 40 percent of GDP. It will be a challenging task, spread over several years, to revive the manufacturing base in India, make it globally competitive and sustain it over the long term. The labour arbitrage between India and China is gone. Chinese are 50 to 60 percent more productive than the Indian labour, but the wages are also higher by almost 70 percent. It may not be possible to replace China as a manufacturing hub, but India can certainly be an alternative in industries, where application of

higher skills is required. As compared to China, India will have a larger youth work force by the year 2022 and also will be the biggest market after China. Indian electronics companies will have inherent advantages over the rest of the world.

It may be seen from Table 1 that the economy of India, is the sixteenth largest in the world by nominal GDP and the fourth-largest by purchasing power parity (PPP). The country is one of the G-20 major economies, a member of BRICS and a developing economy that is among the top 20 global traders according to the WTO. India was the nineteenth largest merchandise and the sixth largest services exporter in the world during the year 2013. India imported a total of \$616.7 billion worth of merchandise and services in 2013, becoming the twelfth largest merchandise and seventh largest services importer. India's economic growth slowed down to 4.7% for the fiscal year 2013–14, in contrast to the higher economic growth rates in the earlier years. IMF projects India's GDP to grow at 5.4% over 2014-15. Agriculture sector is the largest employer in India's economy but contributes a declining share to its GDP (13.7% in 2012-13). Its manufacturing industry has held a constant share of its economic contribution, while the fastest growing part of the economy has been its services sector, which includes construction, telecom, software & IT, infrastructure, tourism, education, health care, travel, trade, banking and other components of its economy.

So far the service sector has been the growth engine for the Indian economy. Since 2002, the manufacturing sector has shown a growth rate close to that of the services sector, but the share of manufacturing in India's GDP has hovered below 17 percent since the economic reforms of 1991. In contrast, the service industry, including construction accounts to about 65 percent of GDP, which was abnormally large for a developing country like ours. This is mainly attributed to extraordinarily large proportion of small scale business, which accounts for 14.9 percent of GDP. Another obstacle for India's manufacturing industry is the wide gap between the organized and the non-organized sector, each of which has its own drawbacks. The non-organized sector, which remains in the level of cottage industries has low value addition and the organized sector is ineffective in job creation due to wide spread automation and dismantling labour intensity. It is of paramount necessity for the government to evolve a new pragmatic "National Manufacturing Policy". The manufacturing sector is

very widely diverse (Table No.2) and it is a matter of concern that India is facing acute shortages in the essential infrastructure for the manufacturing sector - power, rail road, national and state highways, skilled human resources and such others. Manufacturing in India has long lagged behind targeted goals. But now the Indian government's commitment to raise its investment infrastructure from 7 percent to 9 percent is expected to create US Dollar 500 billion opportunity for growth within India's manufacturing sector. There is a perception amongst Indian economists that India will significantly move up the ladder in the manufacturing arena and will take a leading position by the year 2022 (Table No.3). There are some visible signals. It is seen that a number of foreign manufacturers have tackled India's infrastructure bottlenecks head on, with considerable success. There is a genuine feeling that LG looked at India as an export hub. Hyundai has set up its small car manufacturing base in India. Nokia's hand set manufacturing in southern Indian state of Tamil Nadu costs 12 percent less than its counterpart in China.

India offers potential investors in the manufacturing sectors a number of competitive advantages.

- India's own domestic market is large with over 600 million rural consumers.
- India's worker wages are less than half of those in China.
- India has a large talent pool. With a 2 percent growth rate in youth population by the year 2022, India will have an additional 250-300 million working age youth (age group 18 to 50) from which to draw, including a strong engineering eco system.
- India's competitive advantage is in technology intensive manufacturing. Indian manufacturing must be guided by innovations.
- From the strategic point of view, growth in the coming decade will come from the developing world and it is hoped that the 21st century will belong to the Asian Continent. World's major developments will occur in Asia. India is in an excellent position to serve emerging economies in Latin America, Africa and elsewhere in Asia. At current rate this accounts for 11 percent of India's export market. But it is set to grow dramatically.

One challenge facing Indian manufacturing at a time of tremendous growth potential is high turnover. When the economy will grow at a rate beyond 7-8 percent,

companies will face a skill shortage and the turnover will increase from a manageable 2-3 percent to as much as 25 percent, if not more. This creates instability in manufacturing environment. This real challenge can be mitigated dramatically by increasing the capacity of human resources through sustained skill development programs. The other challenge is public sector control over implementation of many of the large infrastructural projects and more specifically

the pre-bid criteria requirements for the companies bidding for these projects, which most of the Indian companies do not meet. This results in many Indian companies losing out in competitive bidding process to foreign companies. A model of public private participation (PPP) in the manufacturing sector for giant defence production needs could be considered for building up core manufacturing capabilities for fast tracking Indian economy.

Table-1 : Overall Indian Economy , Data Source: CIA Fact book <https://www.cia.gov/library/publications/the-world-factbook/geos/in.html> Last accessed on Dec 5th 2014

GDP (purchasing power parity): \$4.99 trillion (2013 est.) country comparison to the world: 4	Exports: \$313.2 billion (2013 est.) country comparison to the world: 19
GDP (official exchange rate): \$1.67 trillion (2013 est.)	Exports - commodities: petroleum products, precious stones, machinery, iron and steel, chemicals, vehicles, apparel
Gross national saving: 33.7% of GDP (2013 est.) country comparison to the world: 16	Exports - partners: UAE 12.3%, US 12.2%, China 5%, Singapore 4.5%, Hong Kong 4.1% (2012)
28.8% of GDP (2012 est.) 30.3% of GDP (2011 est.)	Imports: \$467.5 billion (2013 est.) country comparison to the world: 12
GDP - composition, by sector of origin: agriculture: 17.4% industry: 25.8% services: 56.8% (2013 est.)	Imports - commodities: crude oil, precious stones, machinery, fertilizer, iron and steel, chemicals
	Imports - partners: China 10.7%, UAE 7.8%, Saudi Arabia 6.8%, Switzerland 6.2%, US 5.1% (2012)
Labor force: 487.3 million (2013 est.) country comparison to the world: 2	Reserves of foreign exchange and gold: \$295 billion (31 December 2013 est.) country comparison to the world: 11
Labor force - by occupation: agriculture: 45% industry: 20% services: 31% (2012 est.)	\$296 billion (28 December 2012 est.)
	Stock of direct foreign investment - at home: \$310 billion (30 November 2013 est.)
Distribution of family income - Gini index: 36.8 (2004) country comparison to the world: 80	country comparison to the world: 20 \$225.1 billion (31 December 2012 est.)
	Stock of direct foreign investment - abroad: \$120.1 billion (31 December 2013 est.) country comparison to the world: 28 \$118.1 billion (31 December 2012 est.)

Table 2 : Diversity in Manufacturing

Source : McKinney Global Institute Analysis .

https://www.google.co.in/?gfe_rd=critical=8WF5VKWMDYOEAPvw4K4Dg&gws_rd=sal#q=IHS+Global+Global+Insight:McKinney+Global+Institute.Analyse
Last Accessed : Dec 6th 2014



Group	Industry	R&D intensity	Labor intensity	Capital intensity	Energy intensity	Trade intensity	Value density
Global innovation for local markets (34)	Chemicals	High	Low	High	Low	High	High
	Motor vehicles, trailers, parts	High	Low	High	Low	High	High
	Other transport equipment	High	Low	High	Low	High	High
	Electrical machinery	High	Low	High	Low	High	High
	Machinery, equipment, appliances	High	Low	High	Low	High	High
Regional processing (28)	Rubber and plastics products	High	High	High	High	High	High
	Fabricated metal products	High	High	High	High	High	High
	Food, beverage, and tobacco	High	High	High	High	High	High
	Printing and publishing	High	High	High	High	High	High
Energy-/ resource-intensive commodities (22)	Wood products	High	High	High	High	High	High
	Refined petroleum, coke, nuclear	High	High	High	High	High	High
	Paper and pulp	High	High	High	High	High	High
	Mineral-based products	High	High	High	High	High	High
Global technologies/ innovators (9)	Basic metals	High	High	High	High	High	High
	Computers and office machinery	High	High	High	High	High	High
	Semiconductors and electronics	High	High	High	High	High	High
Labor-intensive tradables (7)	Medical, precision, and optical	High	High	High	High	High	High
	Textiles, apparel, leather	High	High	High	High	High	High
	Furniture, jewelry, toys, other	High	High	High	High	High	High

Table 3 : Movement of developing countries in global manufacturing

Source : McKinney Global Institute Analysis .

https://www.google.co.in/?gfe_rd=critical=8WF5VKWMDYOEAPvw4K4Dg&gws_rd=sal#q=IHS+Global+Global+Insight:McKinney+Global+Institute.Analyse
Last Accessed : Dec 5th 2014

Top 15 manufacturers by share of global nominal manufacturing gross value added

Rank	1980	1990	2000	2010
1	United States	United States	United States	United States
2	Germany	Japan	Japan	China
3	Japan	Germany	Germany	Japan
4	United Kingdom	Italy	China	Germany
5	France	United Kingdom	United Kingdom	Italy
6	Italy	France	Italy	Brazil
7	China	China	France	South Korea
8	Brazil	Brazil	South Korea	France
9	Spain	Spain	Canada	United Kingdom
10	Canada	Canada	Mexico	India
11	Mexico	South Korea ¹	Spain	Russia ²
12	Australia	Mexico	Brazil	Mexico
13	Netherlands	Turkey	Taiwan	Indonesia ²
14	Argentina	India	India	Spain
15	India	Taiwan	Turkey	Canada



India as a global manufacturing hub

- Ashok Adhikary



As a Director RDMA Consultants Pvt Ltd, Ashok is currently working as Consultant in EPC segment of Oil & Gas, Petrochemical & process industries. He specializes in Training in project management, engineering design consultancy and human resource development for engineering industries.

Ashok Adhikary graduated in Electrical Engineering from Jadavpur University and is a post graduate diploma holder in Nuclear Engineering from Bhabha Atomic Research Centre (BARC) Mumbai besides having executive management diploma from IIM, Ahmedabad.

He has more than 40 years of industry experience and worked with BARC, Aker Solutions, Pidilite, Wipro, TISCO etc. He was part of a strategic team for global IT collaborative engineering including 3D application. He has worked for Nuclear and Engineering design and project management field in India & abroad. He has

also worked in Knowledge Management Policy planning and implementation.

He has also worked as consultant to set up Engineering Consultancy unit in the sector of both upstream and downstream of hydrocarbon for global collaborative engineering work in EPC spectrum using Information Technology for Engineering Technology.

His current passion is to study and use Digital Technology in every sphere of life.

Abstract

To fulfill the aspirations of India's large young population and to improve the quality of life, it is essential to utilize the resources, the skills and the people in a constructive way for the overall economic growth of the nation. It needs determination to accept the challenges and lead the country towards harmonious growth keeping in mind the environmental requirements. Creating manufacturing hubs with value added products is an important step in realizing accelerated growth. In order to achieve this goal, determined and coordinated efforts are required to be put in by all the stake holders – the government, public institutions, private enterprises and the citizens of India. This write up highlights some of these efforts which will lead us to better economic condition.

Introduction

In the corporate world, it is common practice to have brain storming sessions amongst the stake holders whenever a policy, program or a product is to be launched. Realistic answers are sought at these sessions for the questions – Why?, What?, When?, Where?, and How?. The outcome of the brain storming helps in drawing up the road map for the successful implementation of the concept or the product. On a much larger scale, such brain storming at various levels will help the country move ahead with the

Implementation of the visionary policies.

Out of the world population of 7.5 bn, India accounts for 1.25 bn people with nearly 66% under the age of 35 years aspiring to improve the quality of life all around. After the globalization and opening up of the world economy in the early 90s, India's GDP improved significantly in the first decade of the current century, but thereafter hit a low trajectory due to many factors of global economic slowdown. The bonhomie of growth during the above period was mainly due to India taking the lead in the growth of the services sector. The contribution of the services sector to our GDP has now reached a peak of 55% whereas the contribution of the manufacturing sector to our GDP growth is approximately 16% as compared to China's 34% and South Korea's 31%. It is obvious that in order to realize the mammoth target of double digit GDP growth rate, there is no alternative other than to push the current manufacturing growth rate in the next decade besides sustaining the services sector growth rate. India needs to transform itself into a global manufacturing hub. Such a sustainable transformation in the manufacturing sector can be brought about only with innovation, quality consciousness and technological up gradation.

Economic and demographic advantage

Today's global economic environment provides India

with an opportunity to start a manufacturing revolution. Taking advantage of the vast youth population we can focus on imparting the requisite skill sets at a rapid pace in order to realize the manufacturing revolution in the country. It is obvious that we will reap the benefits of the demographic dividend only if the youth of the country is trained to work in a competitive global environment. Hence it is essential to initiate mammoth efforts to reduce the gap in the skill sets required for the global environment. Further, in the global arena, our neighbor China is not as successful today as in the past due to labor wage hike and quality issues. China's rising wages are eroding its cost advantage. India can really benefit from this situation, if India becomes a better place to do business. Simultaneously the western world is getting transformed into jobless manufacturing renaissance, with a lot of innovation in 3D printing and robotics. In a few years from now, it may be possible that automation will make labor-intensive manufacturing obsolete across the world. India should protect itself against such a fall out by taking immediate steps to impart our youth the skills required to absorb new technology. Also efforts should be put in to shore up the new techniques for the improvement of the agricultural sector.

Infrastructure

World class infrastructure is an essential pre requisite for setting up a global manufacturing hub in India. The government of India has already initiated several steps for creating such infrastructure through private-public-participation (PPP). Priority is to be accorded for the setting up of Seaports, Airports, Roadways, Railways, Telecommunications and augmenting Power generation capacities in the country. Infrastructure inadequacies in both rural and urban areas are serious constraints for India's growth. Provision of world class infrastructure will automatically attract investments from all over the world to set up manufacturing units in India.

Ease of doing business

Besides infrastructure, the other important requirement to attract investment is to create the ambience that India is a country where doing business is very easy. There is an urgent need for holistic reforms in the areas of Land Acquisition Rules, Labour laws, Tax administration, liberalization of FDI limit in selected

sectors and environment clearance. Finally, single window clearance for doing business in India is an essential requirement to boost the economic progress. To ensure sustainability of growth, particularly with regard to the environment including energy efficiency, the restoration of damaged / degraded eco-systems are important.

In reality, bringing about holistic changes in the present environment is a complex process requiring political will, consensus building skills, and coordinated effort across all the States. Most regulations are needed to be administered by the cooperation of state and central governments. Better industrial relations will create the proper ambience to create investor confidence for further investments in the manufacturing sector.

Job opportunities & Skill development

The push for a manufacturing hub with the target of growth as indicated earlier for the next decade will help create jobs for at least 100 million youth to fulfill the aspirations of the young demography of the nation leading to inclusive growth of the rural and urban poor. Methods are to be deployed to incentivize quality engineering talents to take manufacturing jobs. We have the examples of China, Korea and Taiwan to clearly show that governments can indeed help generate a massive number of industrial jobs if they pursue this goal with dogged resolve. India has got skill, talent, discipline, and determination. India has a favorable opportunity to create a manufacturing hub of massive gigantic industries ranging from electrical to electronics, from automobiles to agro value additive industry, paper to plastic, satellite to submarine and so on.

Quality is the Key

The other important criterion that needs to be stressed is on maintaining quality to compete in the world and stick to goals of sustainable economic growth. India should take all measures of quality assurance that it should manufacture zero-defect goods, so that products we export are never returned. We should manufacture goods with zero-defect, so that they should have no negative impact on the environment.

The focus of planning should be to manufacture the complete value chain of high precision capital equipment as well and increase domestic value addition through technological depth in manufacturing sector. The idea is to enhance global competitiveness

and improve all out awareness for Intellectual Property Rights negotiation for technology. This is particularly applicable for use of capability including business processes in hardware and software to cut the time and to establish systems.

Realizing transformational vision & area of manufacturing priority

Department of Industrial Policy & Promotion (DIPP), Ministry of Commerce & Industry, Government of India are initiating measures to build economic & Trade relations with the international community to facilitate FDI for realizing the transformational vision for creating a global manufacturing hub in India. The area of manufacturing sector is so vast that it encompasses the products from safety pin to spacecraft. In fact various products could be manufactured in the hub –

automobiles, automobile components, aviation , biotechnology, chemical, construction , defence manufacturing, space, IT , electronic goods , TV , refrigerators, mobile, chips, engineering goods, communication equipment, electrical machinery, electronic systems, food processing, textile, leather, media & entertainment, mining, oil & gas , pharmaceuticals, transport - water air rail road highways, power, renewable energy, textile, garments, tourism, hospitality, wellness, medical and healthcare instruments and so on.

However it is important for a step by step approach for fixing priority considering demand, supply and other growth criteria. Initial focus could be in the area like textile & apparel, automobile & components, chemicals, consumer electronics, defence /aerospace/ spacecraft, heavy equipment for infrastructure, agricultural activity, road, rail, etc.

Note of Caution from financial experts

For overall growth and job creation in India, it is not advisable to pick a particular sector such as manufacturing for exclusive encouragement. The financial experts caution us that the initiative should be to encourage the growth and expansion of the manufacturing, the agriculture and the services sectors in a balanced manner for sustaining high growth in GDP. Any attempt to follow the path of other countries (like the export led growth of China) may not yield the desired result in India.

Out of several initiatives for growth, the focus could be to cater for export oriented market for goods

manufactured in India. But if external demand growth gets reduced, we have to produce for the internal market as well. This means we have to work on creating the strongest sustainable unified market.

Improvements in the physical transportation network & infrastructure creation for the same are a must. Further a well designed GST bill, by reducing state border taxes, will have the important consequence of creating a truly national market for goods and services.

It is also important to focus on making business as easy and honest as possible, avoiding artificial props, curbing inflation and fiscal deficits, ensuring a realistic exchange rate. It is preferable to let the market decide which sectors should flourish. This will attract investors from abroad as well as within India to make the manufacturing hub successful.

The challenge is to turn the current situation of land acquisition uncertainty, slow clearances and unfriendly labor laws. Infrastructure remains a big bottleneck, the electricity sector is bust, banks are reeling under bad debts and the acceptance of public-private-partnership (PPP) model is very slow. Further, there is an urgent need to have a relook at the FDI limits in the Insurance and Defence production sectors to facilitate faster growth. The present practice of Ministerial discretions and powers to inspect manufacturing units are proving to be irritants for entrepreneurs. These aspects need a cautious review.

Conclusion

The Indian economy has gathered momentum with the recent “MAKE IN INDIA” initiative of the Government for realizing the vision of creating a global manufacturing hub in India. Recent achievements in the field of Space and Information technologies stand as testimony to India's capabilities. The opening up of the economy combined with the demographic dividend of large young workforce with appropriate skills and supported by systemic reforms to facilitate ease of business coupled with increased quality consciousness will soon make India a global manufacturing hub.

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Did you know

The Fairy Queen is a steam locomotive, plying between the Indian capital of New Delhi and Alwar, in Rajasthan. It was certified by the Guinness Book of Records in 1998 as being the world's oldest one in regular operation after being restored to haul a luxury train in order to boost tourism in Rajasthan. The Fairy Queen runs on the same basis as the Palace on Wheels, the tourist train launched in 1982, and in 1999 was awarded a National Tourism Award.

The 5 ft 6 in (1,676 mm) Indian gauge locomotive was built in England in 1855, and has a two-cylinder engine with a power output of 130 horsepower (97 kW), producing a top speed of 40 kilometres per hour (25 mph). It was placed in service by the East Indian Railway Company in West Bengal, where it hauled troop trains during the Indian Rebellion of 1857, and was withdrawn from service in 1909 and displayed on a pedestal in Howrah until 1943. Heritage status was accorded in 1972 and the locomotive was restored as an exhibit at the National Rail Museum in Delhi. Restored to full working order, in 1997 the Fairy Queen returned to commercial service for the first time in 88 years.

Source : Wikipedia

Jessop & Company Limited is India's oldest engineering and manufacturing company, established in 1788.

The roots of Jessop & Company Ltd. go back to 1788 when Breen & Company was founded in Calcutta. In 1820, Henry and George, sons of William Jessop acquired Breen & Company on behalf of Butterfly Company established in Derbyshire, England in 1790 by William Jessop. These two companies merged together to become Jessop & Company. Subsequently in 1973, the company was taken over by the Government and Jessop became a Govt. of India undertaking. In 1986, with the formation of Bharat Bhari Udyog Nigam Limited (BBUNL), a Public Sector Holding Company under administrative control of Deptt. of Heavy Industry, Ministry of Industry, Govt. of India, Jessop became a subsidiary of the Holding Company.

During the last two centuries, the company has consistently modernized and streamlined its production facilities to keep abreast with the latest technology and has introduced many new products for core sector industries in the country.

Source : Wikipedia

IPR and Manufacturing

- Kishore Kanjilal



Kishore Kanjilal is Bachelor and Master of Electronics and Telecommunication Engineering from Jadavpur University. Certified Information Systems Auditor (CISA)

Experience : More than 32 years in Aviation IT and IT Infrastructure and 10 years in IPR. Held senior positions in Air India, Schoolnet, Skytech Solutions (IT arm of United Airlines) and Global Travel Solutions (Jet group). Specialization in Aviation IT products and product development

Other Information : Represented Air India in IATA IMC (Information Management Committee) and Airline Technical Committees of UNISYS and SITA. Speaker at several technical and IPR forums including IATA IMC and CSI Annual convention .

Presently he is serving as independent consultant in Aviation IT and IPR

Abstract :

India is aspiring to be the manufacturing hub of the world and provide a stiff competition to China. While India has several advantages, one area where we definitely lag behind is in exploiting Intellectual Property Rights. In India on an average 40,000 patents are applied annually out of which more than 80% are foreign filings. China has 10 times the number of filings and a large portion of these filings are by Chinese companies. India has a huge amount of IP in terms of copyright and traditional knowledge but a significant amount of the IP is not documented and registered. IPR forms the bedrock for today's manufacturing and without ownership of IP Indian companies will never be global leaders in manufacturing. Indian companies have realized the value of owning IP especially patents to pose a serious challenge to global leaders and are striving to catch up but there is a still long way to go. IPR awareness is the fundamental requirement that will enable documentation of existing IP and convert innovations into IPR. IPR provides the legal powers to protect innovations and stay ahead of competition. This article gives an insight to the role of IP and why it is imperative if India wants to play a stellar role in innovation based high end manufacturing.

1.0 Introduction

Manufacturing encompasses a large canvas from manufacture of simple articles like safety pins, nuts and nails to very large entities like spacecrafts, commercial

airplanes and ocean liners to extremely complex products like drugs and precision instruments. However manufacturing essentially comprises of products and processes and sales and marketing of these products and processes. During the entire cycle of manufacture a large number of valuable intangibles are created and used. These intangibles are Intellectual Property (IP) and are legally protected by Intellectual Property Rights (IPR). Many of the IPs can be kept as closely guarded secrets like the Coca Cola formula or the recipe of Kentucky Chicken but others need to be disclosed to customers, partners or vendors. Disclosure of IP is done by licensing agreements and nondisclosure agreements enabling legal use of IP. It may be noted even Open Source products are not devoid of IP and there are stringent clauses in the licensing agreements for the use of Open Source products. Some of the essential IP created or used in manufacturing is given in the Table-1 below

From the above Table we can see that IP is of different hues and different methods are required for protection. Any IP can be protected as a Trade Secret if the owner can guarantee its nondisclosure. However as a product will be sold it cannot be kept as a Trade Secret if it can be easily reverse engineered. A new or improved product or process which is visible and can be reengineered needs to be protected by a patent but an embedded system for a Fuel Control Unit of a jet engine can be protected as a Trade Secret. Brand names and logos are protected by Trademarks while

Product	Process	Marketing & Sales
New invention	New process	Brand
Improvement to existing invention	Improvement to existing process	Logo
Design	Procedures	Market Survey
Drawings	Systems	Distribution channels
Models	Software	Customer lists
Formulae	Technical documents	Campaigns
Recipes	Technical data	Export
Software	Test methods and data	Advertising
Technical documents	Training manuals	
Technical data	Supplier information	
Training manuals	Permits	
Test methods and data	Manpower information	

any expression of an idea fixed in a medium (design, procedures, data, manuals etc) that needs to be disclosed is protected by Copyright. In short manufacturing creates IP that requires protection by one or more forms of IPR namely Patents, Copyright, Trademarks, Industrial Design and Trade Secrets.

1.0 Value Chain

Manufacturing is no longer centralized to the country where the product was first created. It is becoming more and more decentralized depending on economic necessities. Complex products like a commercial aircraft have components from thousands of vendors and are sold to customers all over the world. As a result both the Demand Chain and Supply Chain are becoming highly complex and the orchestration of the

Value Chain is becoming a daunting task. Across the entire Value Chain there are a large number of organizations each having a list of Intellectual Property that has to be protected by each participant in the Value Chain. The list of IP created or used at each step of Value Chain is given in Figure – 1

Figure-1 illustrates that IP is generated, needs to be protected and leveraged across each step in the Value Chain. The owners of the IP can be

- Organization
- Vendor
- Partner
- Distributer
- Third Party

SCM-IPR at each step

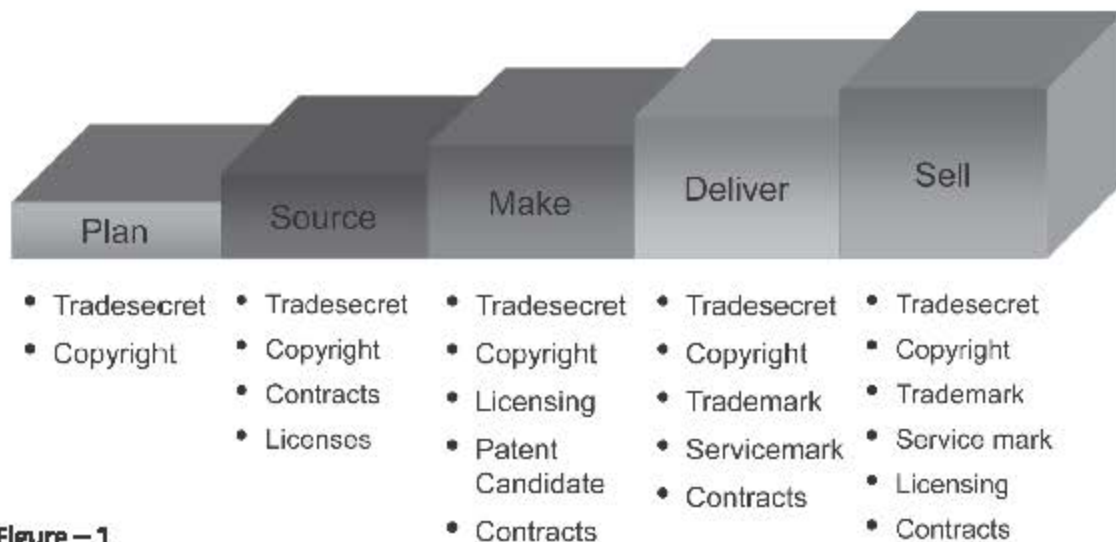


Figure – 1

- Open Source
- Public Domain

The possibility of ownership of IP by multiple entities germinates from the present trends of manufacturing that entails:

- Outsourcing
- Joint Ventures
- Teaming and collaborative development

Joint Ventures and Teaming and collaboration in manufacture opens up complex issues of IPR ownership like contribution of each partner for existing IP, nature of ownership of new IPR and revenue sharing.

The use of existing IP and rights to new IP is determined by nondisclosure agreements, licensing and contracts with proper IP indemnity clauses in case of IP violations. As IP infringement can result in huge damages awarded by courts proper indemnity clauses are essential in contracts to safe guard against IP infringement. What you will get will be determined by contracts and not what you deserve.

3.0 Critical IPR Issues in Manufacture

3.1 Cross Licensing

Cross licensing is an agreement according to which two or more parties grant a license to each other for patents owned by each of them. Cross licensing is used where there is a possibility of each infringing others patents. Very often, the patents that each party owns cover different essential aspects of a given commercial product. Thus by cross licensing, each party maintains their freedom to bring the commercial product to market. The term "cross licensing" implies that neither party pays monetary royalties to the other party. Parties entering in cross licensing must be careful not to violate antitrust laws and regulations. Patent Thickets are areas of intense patent activities in selected technological areas of significant commercial importance where it is very difficult not to infringe patents. Instead of licensing or getting into patent litigation cross licensing is used extensively. With convergence of technology like camera, phone and Internet most of the leading vendors like Microsoft, Cannon, Sony, Samsung, Google and Apple to name a few have entered into various cross licensing agreements to make development faster without patent litigations.

3.2 Software and Open Source

Software is an integral part in manufacturing. The software may be in the product itself like a mobile phone, digital camera or washing machine or a part of the product process right from design, project management, testing and implementation. As there are several players in the Value Chain the software used in each instant need to be properly licensed.

Software is normally protected by copyright and is a non-patentable subject matter. Software was considered to implement an algorithm in a formal language and algorithms are not patentable. However several amendments to existing laws allow patenting of software. The patentable criterion varies from country to country. Generally software that has a Technical Effect is patentable in most countries. Some countries like USA are more liberal and permit Business Process patents. Any infringement of software patents will depend on the country where the infringement takes place. However with the advent of Internet and the collapse of distance territorial jurisdiction for patent violation is becoming a very complex legal issue.

Copyright license violation for software can be circumvented by redeveloping the software by reverse engineering using clean room development. Fair use and merger doctrine are also available to defend a copyright infringement violation. However a complex software cannot easily be redeveloped and it is desirable to have proper licenses otherwise penalties can be severe for infringement.

Use of free and Open Source software is a far trickier subject. Software that is available in the public domain free from any licensing conditions can be used without IPR violations. However most of the Free and Open Source software under Free Software Foundation (FSF) and Open Source Initiative (OSI) are subject to license conditions that can be detrimental for product development. The GPL license for example is viral and any development based on existing code under GPL requires full disclosure of the development. Other OSI licenses also have several restrictions and use of Free or Open Source software without studying the license conditions can be catastrophic.

3.3 Use of Standards

Standards play a very important role in manufacturing. Some standards are mandatory like for auto emission and manufacture of food and drugs and others are

optional. However some of the optional standards have become essential to ensure seamless connectivity and interoperability. Standards are developed by technical committees set up by Standards Development Organizations (SDO) and the standards are published by SDOs. All standards documents are protected by copyright.

Standards generally have underlying patents. Technical experts who participate in developing standards are experts in the field and are already involved in developing the necessary technology and have associated patents. Patents which are essential for the implementation of standard are called essential patents and have to be disclosed before the standard is published. There can be other patents for the standard called nonessential patents that are not mandatory and work around solutions for the patents are available.

Essential patents are made available to all users on a Fair, Reasonable and Non Discriminatory (FRAND) basis ensuring all manufacturers implementing a standard pay the same price for essential patents.

4.0 Conclusion

- IPR is probably the most critical factor in manufacturing. Ignorance of IPR is not a reason to grant relief from IPR infringement. As penalties can be extremely high it can cause severe financial damage to a company. IPR is also a valuable asset and can be used effectively to have a limited monopoly for products and processes, generate revenue from licensing and use it for cross licensing. Patents for aircraft engines have been successfully licensed to car engine manufacturers to earn revenues. Patent infringement knowingly or unknowingly can be detrimental. Some examples are given below:

- The auto focus camera story
 - Honeywell makes \$500 m from a failed research project
- Take the BIG GUN on
 - i4i makes \$ 290 m out of Microsoft for patent violation
- Throw competitors out of gear
 - Amazon stops Barnes and Noble express check-out before Christmas
- Protect your assets
 - Napster and other P2P sites prevented from free music downloads

- KODAK Vs Polaroid - \$909m damages for Polaroid

With the Prime Minister's clarion call "Make in India" we are probably entering the global era in manufacturing. This will require compliance in IPR as per international requirements. We have already complied with product patents since 2005 and will have stricter copyright laws and implementation and protection of Digital Rights management (DRM) as per international requirements. However Indians may not be leader in patents but the IPR we have in copyrights, traditional knowledge and Trade secrets are enormous. Frugal engineering is also an IPR asset we have yet to exploit. Once the IPR issues are taken seriously we can make giant strides with our assets in frugal engineering, herbal medicines and traditional knowledge.

Acknowledgement : I would like to thank Mr Subramanian Vutha (Legal and IPR Consultant) and Mr Kalyanraman Subramaiam (IPR Consultant) for their various inputs.

Did you know

The heart of modern electronic world is the battery. The lithium-ion (Li-ion) batteries found in everything from smartphones and laptops to aircrafts have been on sale since 1991, their performance gradually improving. Lithium-metal anodes have the highest energy-storing capacity of any known material and, because lithium is the least dense metallic element, a big power-to-weight ratio too.

For a rechargeable battery to be commercially viable, it must have a charging efficiency (the percentage of electrical energy stored during charging that is recoverable during discharge) of greater than 99.9% over as many discharge/recharge cycles as possible. Dr. Cui of Stanford University is researching on a new generation of battery and estimates that a battery with a lithium anode and sulphur cathode (sulphur also has a very high energy capacity) would be able to hold about five times as much energy as today's Li-ion batteries, weight-for-weight.

For further reading : Caging the Li-ion, An advance that could make batteries last a lot longer, The Economist, Sept 13th 2014.

Manufacturing needs to gear itself to face price volatility in the trade cycles

- Shyamal Gupta



Shyamal Gupta has a wealth of rich experience to give perspectives and connect the dots of unrelated events in commodity domain. He was a university rank holder at graduation in Economics; he has done his post-graduation from IRMA. He has worked with companies like ADANI, HDFC Bank, MCX, KOTAK and NCML handling various leadership positions.

He has multifunctional and multidimensional experience in the commodities domain spanning two decades and his expertise in the field of commodities include International Trade, Futures Trading, Structured Trade Finance, Port, Warehousing and Collateral Management to name a few. He has also periodically contributed numerous articles in leading financial newspapers.

The ability to manage commodity price volatility will determine survival of the manufacturing companies in a globally connected world

The final product of a manufacturing company contains various commodities in varied quantities. The commodity prices have a strong tendency to fluctuate in trade cycles. Currently the procurement function within most manufacturing organisations does not have real-time access to information or the solutions to manage price associated risks. These companies should take a lead from commodity peers. Manufacturing industry can follow a time-tested market proven path to effectively & efficiently manage the commodity acquisition process – regardless of the volatile market around them. This can be done by accessing real-time prices and developing a logistical information system that often determine the global price trend. Facing a commodity battle and trying to avoid is not a solution. As many of the large raw material sellers nowadays control the pipelines, shipping docks, tankers and warehouses, companies need to have access to proprietary information that can help them anticipate and trade on price trends.

To overcome the threat of volatile commodity prices, techniques have been tried and tested with various degrees of success. For companies exposed to commodity price risks, the unchecked volatility can quickly wipe out its profitability.

Commodity risk is not only when the prices go up but it is also when the prices go down. Raw materials bought

at higher price will cause the price of manufactured goods to be more expensive than the competition in the market.

The recent decline in the price of industrial commodities can partly be explained by economic changes taking place in China. In the last two decades, China had been consuming coal, iron ore, copper, oil and other commodities with insatiable appetite. While China's economic transition (reverses) in recent times was expected but stagnation in Japan and conditions pointing towards impending European deflation were unanticipated.

Traditional approaches are no longer adequate

With a recognition of pricing risks in many markets, long-term fixed-price supply contracts have become difficult to negotiate. In the face of increasing volatility and uncertain demand outlook, both buyers and sellers have migrated to risk-sharing and price smoothing contracts as a way to adopt a middle path. Under a typical long-term supply contract the buyers and sellers agree to a price corridor, wherein the price cap is set above the current market benchmark. The buyer absorbs any fall in price up to the floor, and the seller absorbs price increase up to the ceiling, for the tenure of the contract.

The commodity super-cycle and the recent downturn has disrupted traditional arrangement. A case in point is the mine owners and the buyers (coal, iron ore, copper) moving away from long-term supply contracts

to even selling the commodity at the prevailing spot market prices.

In an attempt to insulate themselves from the fluctuation in raw material prices, secure uninterrupted supply and boost operating margins, large corporates have tried to adopt backward integration, wherein they acquired the raw material sources. A case in point is the slew of coal mine purchases in Australia, South Africa and Indonesia by Indian companies and utilities. But this strategy is very costly and capital intensive. It is also fraught with political risks as the local government may any day change its export policies.

Price Volatility

Commodity prices rose dramatically since beginning of the new century. By mid-2008, increased demand accompanied record-high prices not only for oil, but also for major commodities of interest to industrial products companies including aluminium, copper, steel and iron ore.

This increase in price and demand was set in motion by many factors that combined to create market uncertainty. Economic growth in Asia (China & India more specifically) and Latin America sparked demand and highlighted a scarcity of resources on a global scale. To secure the availability of certain commodities, needed to sustain growth and meet public demands, companies and governments started investigating ways to stabilize their oil and gas commodities. Meanwhile, new market platforms were being established for gas, electricity to name a few, in addition to an increased use of OTC (over-the-counter) markets.

Recent low commodity prices is expected to have a significant boon for India, considering that it imported US\$ 178 billion worth of commodities during the last financial year. This amounts to 9.5% of GDP. Crude oil was the largest part of the imports. India would also benefit from lower prices for industrial commodities such as coal, metals etc. During the quarter Jun-Sep 2014, the raw material cost as a percentage of sales in the corporate India has come down, which is further likely to come down in Oct-Dec 2014 quarter. However, questions of end-users' demand remains uncertain.

Leading industrial products companies tend to take three basic approaches to manage commodity price risk. These strategies are employed to varying degrees at many companies and are often used in combination.

Margin management

Most of the manufacturing companies are consumers of commodities. The most common and least expensive approach to managing price risk is to avoid the risk altogether by passing it on to your end customers. However in competitive market environment this is not always possible. In practice, some level of price elasticity is typically at play in competitive markets. For most of the recent past, with robust global growth and tight capacity across many sectors, simple price increases have been effective in the short term. However, with slowing global growth and excess capacity, this strategy is not likely to continue to produce results. Offering only a cheap price is the last refuge of a marketing department out of ideas for creating value for customers. Let a company not acquire a core competency in cutting prices by falling into the commodity trap.

Procurement strategies

Beyond accepting price risk or raising prices to accommodate cost increases, many companies manage commodity risk through the procurement function. A typical procurement strategies focus on risks associated with availability and reliability of supply, product quality and overall cost level versus some benchmark. But suppliers may also be an important way for manufacturing companies to manage commodity prices.

Often, vendors may not offer the most attractive pricing and at the same time, they often expect specific volume commitments associated with guaranteed pricing. In addition, in a rapidly rising price environment, holding suppliers to prices that may no longer be tenable often creates some thorny vendor management issues. On the other hand entering into a long term contracts in a falling market situation will result in the high cost of production and will cause competitive disadvantage.

Hedging

Often, the most flexible and cost-effective mechanism to manage price risk is to use derivative financial instruments to synthetically hedge underlying price exposures. Derivative instruments are financial contracts that can either be traded or negotiated in a bilateral fashion (over-the-counter) between buyers and sellers of commodities.

Market participants may include producers, processors, or consumers of the underlying commodities and increasingly, speculators looking to profit from commodity price movements. However, in the commodity markets, given the highly specific needs of end users' risk profiles with respect to specifications, timing and delivery location, commodity derivatives may often be limited in their effectiveness.

For instance, if a company would like to hedge a purchase of crude, there are alternative derivative (futures and OTCs) instruments to do so at attractive prices. Alternatively, a company looking to hedge purchase of bunker fuel (for ships) may have less flexibility. It is this difference between the hedged commodity and the hedging instrument; often referred to loosely as "basis" that limits the effectiveness of using derivatives in many instances.

Use derivatives with caution

Just as it is wise to wear safety glasses when using a saw, it is also wise to ensure that the company has a well-controlled and managed derivative hedging program. Despite some of the inherent limitations in using commodity derivatives, many industrial products companies successfully manage commodity exposure associated with energy purchases (electricity, natural gas, transportation fuels), industrial metals (steel, aluminium, copper) and precious metals (platinum, palladium), among others using derivative instruments.

The activity of hedging is undertaken mainly for shielding the revenue streams, profitability and balance sheets of companies against adverse price movements and cyclical reversals.

Protection of Profit

Margins have become more volatile, even without further increases in commodity prices, the impact of commodity price volatility on the bottom line is magnified. This should force management to focus its efforts to mitigate these effects.

At times, the synergies between commodities and manufacturing can also be evidenced at the firm-level. Nokia's business origins were in pulp and paper milling in the 1860s which subsequently provided the surplus for Nokia (though the company no longer exists) to move into cable manufacturing and mobile telecommunications.

In turn, the capabilities developed in industry can be

fed back into commodities production by reducing costs and enabling the exploitation of less well-endowed mineral seams, oil deposits and agricultural land. Sweden's industrialization after 1850 was driven by export booms in cereals and sawn wood, and later in pulp, paper and iron ore. Lately after the mobile boom the country lost its capability in commodity business and consequently facing tremendous economic hardship. These historical experience involve a positive symbiosis in which industry was stimulated by linkages from the soft, hard and energy commodities sectors.

Managing commodity price risk feeds directly into managing profitability volatility. Fortunately, financial derivative markets exist for a wide range of commodities, particularly in energy and industrial metals, such as aluminium and copper which allow a company to manage these market risks. These derivative contracts have the effect of fixing or capping the cost of commodities. By using such financial hedges, a company can therefore directly reduce the volatility in its cost base, protecting margins and allowing the business to make secure financial plans.

No doubt, some manufacturing companies are becoming more data-driven and analytical than ever in how they look at building supply chain partnerships, leveraging technology in new and creative ways to set strategy and manage and measure performance. Organizations are also increasingly lobbying governments to drive trade policy in their own best interests, creating a new intersection of policy, business and supply markets. And let's not forget... Apple... which as a company is asserting itself by taking advantage of supply chain knowledge and global supply markets to push through continuous profitability.

With intense global competition, outsourcing and offshoring are all squeezing margins thereby increasing customer price sensitivity and making it harder to sustain inter-brand differentiation. The product life cycle suggests that, as product categories mature, they become more susceptible to the forces of commoditization. No doubt the better managed firms find a way to make money even in the commodity cycle.

