Event Report of

Training Programme on Technology Diplomacy

Jaipur, India, November 02-06, 2009

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Executive Summary

CUTS CITEE[1] organised a training programme on "Technology Diplomacy" in Jaipur, from November 02-06, 2009, in order to build the capacity of scientists and technologists working with various ministries/departments/councils/institutes/research labs of Government of India. The Department of Science and Technology, Government of India, supported this training programme to fill the vacuum that exists in terms of absence of adequate institutional base in India to offer training/education on issues related with technology diplomacy.

Technology has played a vital role not only in the economic development of countries from time immemorial but has also been an important part of international relations. In recent years, the pace of technological development has increased manifold and today it is at the root of many trade controversies/disputes. Advancement in science and technology has led to increasing demand for expert inputs, especially as a prerequisite for successful negotiation of international agreements. The two important ground realities crucial for international negotiations are:

- scientific and technological knowledge calls for specialised knowledge; and
- international diplomacy caters to demand for application of science and technology to development, leading to specialisation integration in/of divergent areas.

Unlike their counterparts in developed countries, negotiators and policy makers in developing countries often lack understanding of the underpinnings of science and technology agreements and, thereby, effective negotiation techniques. One reason is the relative inadequacy of education and training in technology diplomacy. Therefore, this training programme has the aim of facilitating an overview of the basic principles of technology diplomacy, including technology sourcing and assessment and an understanding of the technology agreements. Such training programme will hopefully prepare the scientists and technologists to better exploit the opportunities that arise from the use of technology.

The said training programme was well attended by government officials, scientists and technologists from various ministries/departments/councils/institutes/research labs of Government of India. The training programme brought experts/resource persons together to explore and deliberate various aspects of technology diplomacy issues. Over the period of five days, the participants sharpened their skills on various aspects of technology diplomacy issues through lectures, real life experiences of resource persons, simulation exercises, group discussions, etc.

Based on the feedback received from the participants and resource persons, it can be confidently said that the training programme was successful in terms of quality of participation, resource persons, resource materials and administrative and logistical arrangements. Participants acknowledged that learnings they derived from the training programme proved to be extremely enriching and valuable. Participants overwhelmingly found it very useful and looked forward to attending similar training programmes in the future.

This report summarises the presentations, principal issues identified and points discussed during the course of five-day training programme.

[1] CUTS Centre for International Trade, Economics & Environment (CITEE) was established in 1996, with the aim being a high-level global standard institution for research and advocacy on multilateral trade and sustainable development issues. Consumer Unity & Trust Society (CUTS), the parent body, was established 25 years back as a consumer rights organisation and has been engaged actively in research and advocacy on policy issues. For more details about CUTS International and CITEE please visit our websites www.cuts-international.org and www.cuts-citee.org

Inaugural Session (Session 1)

Atul Kaushik, Adviser (Projects), CUTS International

Atul Kaushik inaugurated the training programme by providing an overview of CUTS International and mentioned that CUTS ventured into the field of international trade during the peak of Uruguay Round in 1991 and since then has contributed distinctly as a non-governmental organisation (NGO). He apprised that the Department of Science and Technology (DST) approached CUTS for organising this training programme, after considering its rich and valued experience. He warmly welcomed the participants and expressed the hope that the training programme will prove beneficial to them and certainly help them in acquiring knowledge on technology diplomacy issues. He mentioned the need to access and leverage modern science for the poor and a set of globally renowned experts in diplomacy as well as science. He underlined the vital role played by technology in the economic development of countries and the demand that advancement in science and technology generated for expert inputs in successful negotiation of technology agreements and, therefore, training of government officials.

Kishan Rana, Former Ambassador to Germany and Fellow DiploFoundation

Rana during his keynote address, extended his sincere gratitude to CUTS for providing the opportunity to be a part of this training programme. He stated that the agenda of the training programme is quite comprehensive and seeks to impart in-depth knowledge and understanding of and skills in addressing technology diplomacy issues through resource persons of competence. He pointed out that Pt. Nehru had an extraordinary vision of making India a knowledge power and, ever since there has been a strong science and technology dimension in Indian development. He narrated the technology diplomacy involved in establishment of Indo-German Science and Technology Centre and requested the participants to go through a chapter on science and technology written by him in a book entitled 'Inside Diplomacy'. He posed several questions such as how to make India a better partner for external co-operation? External cooperation is only one part, first task is within India – in future programme – built in a domestic dimension of technology outreach etc., to the participants to ponder during the five programme.

Expectations of the Participants

During the inaugural session, participants were requested to express their expectations from the training programme. Their expectations are summarised below:

- How to locate technology, i.e., technology sourcing?
- To understand Technology agreements which includes IPR and its negotiation,
- How to assess technology and how to sell it and experience commercialisation, thereby benefits out of it?
- To learn about Patents drafting,
- Insight on open source and IPR scenarios and how the same can be handled when dealing with Government.
- To understand Technology diplomacy at the domestic front

Session 2: Diplomatic Environment

Kishan Rana, Former Ambassador of India, Senior Fellow, DiploFoundation

Kishan Rana mentioned that technology diplomacy is only one component of economic diplomacy. Commerce and economics is at the centre of such diplomacy and economic interests often determine political and external relations. Therefore, economic coordination and networking among various government, non-government actors and foreign missions is essential, such that 'whole of government' methods are practiced with unified policy direction.

He also emphasised that diplomacy is all about tradeoffs and the give and take does not necessarily have to be in the same subject area. Diplomats are needed to make intelligent connections between unrelated areas, such that win-win outcomes are achieved. This is possible only if different functional ministries work together with the Ministry of External Affairs (MEA).

Most international partnerships are built on trust, rather than on mathematical values of what has been given and received. It is impossible for both negotiating parties to get deals of equal outcome. External cooperation largely hinges on building trust and trust is built on personal relationships, which, in turn, is effectively achieved through embassies. While scientists/ researchers from emerging economies like Brazil, South Africa, South Korea and India are teeming with ideas, they are not utilising embassy offices as a channel of communication for increasing cooperation in science research and technology.

He urged the participants, mostly scientists, to take this message to their respective institutions and work towards generating the demand for the needed technology and also communicate their demands to the MEA, rather than working in isolation.

He pointed out that 'country brand' affects the way we are perceived and each one of us builds India's image through personal interactions with foreigners. Public-private partnerships (PPPs) have evolved effectively overtime, but this mechanism has not yet been adequately utilised by scientific institutions. He cited an example of 'India Brand Equity Fund', an innovative PPP device between the Ministry of Commerce and Industry, Government of India, and the Confederation of Indian Industry, with the objective of building a positive economic perception of India globally.

He opined that scientists/academics usually interact within their circles and there is a need for them to research out and communicate with business personnel, practitioners and users of technology.

Pointing to the numerous free trade agreements (FTAs) that are in operation and negotiation, he mentioned that they offer the potential for technology transfer and partnerships. While India is strong on brain power and innovation, the lack of a culture of commercialisation of innovative ideas is an obstacle. Moreover, the marketing capacity of India's innovation activity abroad also needs to be strengthened.

Lastly, he reiterated the need for target-setting, through consultation, building promotional networks at home and abroad, better utilising embassy networks, pursuing a unified strategy and sustaining the 'whole of government' approach.

Session 3: Basics of Technology Diplomacy

Kishan Rana, Former Ambassador of India, Senior Fellow, DiploFoundation

Kishan Rana mentioned that technology diplomacy is a specialised branch of diplomacy, with distinct special features, but also features in common with diplomacy. Further, technology diplomacy seeks to maximise connections in the fields of interest to the home country and exploits available avenues for mutually beneficial partnerships, leading to win-win situations.

Diplomacy is a craft skill and hinges on personal connections, shared interests and mutual trust. He mentioned that working to short-term advantage or one-sided gain is a recipe for disaster, as this leaves a legacy of bitterness and breaks down mutual trust in future dealings. Building trust involves investment of personal effort, real commitment as well as sincerity.

He opined that scientists need to reach out to potential 'commercialisers' and users of technology, and even utilise consultants if that achieves the purpose. Once the potential for partnerships with foreign institutions is identified, Indian embassies need to be approached and foreign missions effectively used as an umbrella for cooperation.

While it is necessary to cultivate partnerships between scientific institutions and science administrators, personal ties need to be leveraged into institutional connections. As institutions outlast a person, such actions of building institutional partnerships by way of personal connections would deliver increased benefits. He added that a Memorandum of Understanding (MoU) is only a preliminary goal or an agreement for furthering a broader arrangement. A piece of paper such as a MoU leaves behind a trace with no cast-iron commitments. However, such a piece of paper can be used as a platform to achieve a larger outcome. It may take years to sell an idea and there is a need to enthuse people about what you are selling. It may take years to negotiate a deal, but the key is to be persistent in a pleasant manner.

He also advised on the need to put aside egos and hierarchies to effectively establish working connections. In addition, individuals have to find innovative ways to make connections via conferences, education or scientific institutions and also by extending invitations to the right people to visit the country. It is important to read and learn about the target county and travel as much as possible.

Embassies and science counsellors have to find a way of fitting the concerns of the entire team. Hence, networking and building personal relationships with own colleagues are crucial, as there are issues which only ambassadors can talk about more effectively than scientists. He recommended that science counsellors should to be familiarised with the MEA's work culture.

In today's changed global scenario, every major country is trying to use science and technology for partnership. He recommended that a compilation of best practices on building such partnerships should be established, along with studying experiences of other countries in this context.

Lastly, he emphasised the need for 'broad-band' skills, awareness of technology developments at home and abroad and smart systems in place to use the science counsellors as a key link in this context. As the task of promoting home country interests is complex and multi-faceted, apart from being proactive, creating and looking for opportunities, teamwork is crucial.

Session 4: Historical Perspective and Approaches to Technology Diplomacy

Deepak Bhatnagar, Head, Centre for International Trade in Technology

At the beginning of the session, **Deepak Bhatnagar** thanked CUTS for inviting him as a speaker and appreciated the initiative of the Department of Science and Technology and CUTS. His session on Historical Perspective and Approaches to Technology Diplomacy was more interactive in nature than an isolated presentation. Queries by participants were answered, as and when they arose. He mentioned that technology diplomacy is a vast and complex subject, with diverse views and, therefore, should be grasped with open-mindedness. Technology diplomacy covers activities at both national and international levels, pursuant to international commitments.

Advances in science and technology have become drivers in international relations and knowledge of trends in key fields is an essential prerequisite to effective international negotiations. Knowledge of trends in science and technology is also an important element for the successful national implementation of international agreements.

Two key features of the growth of scientific and technological knowledge are central to international negotiations. First, scientific knowledge is becoming increasingly specialised and, therefore, demands greater expert input into international negotiations. Second, the application of science and technology to development requires the ability to integrate the divergent disciplines to solve specific problems. International diplomacy now demands that government negotiators deal with both specialisation and integration.

Bhatnagar focused on the evolution of technology diplomacy in India and mentioned that India has a long history of technology diplomacy. The first such diplomat was King Porus, who gifted 100 talens of steel to Alexander the Great in 326 BC – unwittingly using 'diplomacy' to avoid being hanged or becoming a prisoner-of-war! For the uninitiated in the history of steel-making, commercial production of steel began after the industrial revolution in Europe. The talens, a metal, in those days was used for making high quality swords and other battle weapons. He then stated technology diplomats of India in recent times who have emerged as an important players in global technology diplomacy and mentioned few names of the diplomats such as Dr Sanjay Gupta, now with the Barrack Obama (US President) Administration, Sabeer Bhatia (Hotmail), etc. The place of pride in technology diplomacy in India, however, goes to eminent Indian scientists such as Nobel Laureates C V Raman, Hargovind Khurana, S Chandrashekhar and Venkataraman.

The issues of technology diplomacy these days have become complex and more integrated. The need for and importance of networking in the emerging world order has recently increased. He discussed India's transition from dependent economy (during British rule) to independent (after independence in 1947 till 1991) to inter-dependent economy (after 1991 till date). With globalisation, the world has become increasingly inter-dependent, in terms of technology diplomacy and its uses. The usage and application of science and technology determines the political and economic power of states. It is also the only solution to human misery and development bottlenecks. Technology diplomacy in the modern era, therefore, plays a significant role in addressing these issues.

He discussed the role of science and technology in international diplomacy and trade. Young scientists need to have both specialisation and the ability to integrate divergent technologies. Bhatnagar further asserted that young scientists should be very focused in their research work, which can be inculcated by a regular practice to note down new research ideas; sharing of these ideas with other known scientists; and forming a network, etc. He also informed the

participating scientists that the Government of India has various programmes under various departments to promote excellence in research-related activities and young scientists should prepare themselves to exploit such opportunities.

Session 5: Sectoral Case Study: Steel Sector

Deepak Bhatnagar, Head, Centre for International Trade in Technology

Deepak Bhatnagar in this session dealt with various aspects of technology evolution that the steel sector has experienced so far. He apprised that humble beginnings were made in India in 1874 when the Bengal Iron Works (BIW) came into being at Kulti, near Asansol, in West Bengal. However, 44 years before that, in 1830, a foreigner, named Joshua Marshall Heath, had set up a small plant at Porto Novo on Madras Coast. Heath produced in his plant pig iron at the rate of forty tonnes a week. The BIW made considerable improvement in the process of iron and steelmaking.

The possibility of larger production became visible after the establishment of Tata Iron and Steel Company (TISCO). For modern India's iron and steel industry, 1907 was a red-letter day, when the TISCO was formed as a *Swadeshi* venture to produce 120,000 tonnes of pig iron. The TISCO plant at Sakchi (renamed Jamshedpur) in Bihar started pig iron production in December 1908 and rolled out its first steel the following year. TISCO had expanded its production capacity to one million tonnes of ingots by the time the country achieved freedom. It was chiefly with the help of American experts that the Tata's started the enterprise.

However, it was only after independence that the steel industry found a strong foothold, when the Rourkela, Bhilai and Bokaro Steel plants were established in collaboration with the erstwhile Soviet Union. Soviet Union in those times was the most important and accessible country for India, in terms of technology acquisition. The country extended its support not only in terms of setting up of the plants but also supporting in operationalising and running these.

The Indian steel industry can be said to have now arrived at the world stage, with the emergence of a number of leading steel producing companies in India, including SAIL, Tata Steel and others. In the last over six decades of evolutionary phase, the industry has now attained the status of one of the leading producers of iron and steel in the world. The technology used by the Indian steel industry has also improved significantly. Indian companies have also started acquiring leading foreign global companies recently. These all have helped India to achieve production of over 55 million tonnes of steel. A small documentary was also shown to the participants on the steel manufacturing and then discussed with technology diplomacy perspective.

Session 6 - Technology Sourcing and Assessment

Vinay Kumar, Former Adviser and Head, Technology Management Division, Department of Science and Industrial Research (DSIR) and Visiting Faculty at Indian Institute of Technology (IIT), New Delhi

Vinay Kumar, in this session, covered technology sourcing and assessment, which included comprehensive discussions on management of technology. He emphasised that understanding of technology management requires understanding of areas like technology assessment, transfer and diplomacy. It was an interactive session and a lot of questions and points were raised by the participants, while Kumar was satisfactorily answered all of them. As a result,

the following description includes what points were raised by both Kumar and the participants, without specifically attributing points to the people that raised them.

Kumar expressed that technology management was rightly gaining popularity in courses in IIT and Indian Institute of Management (IIM) institutes around India, either through MBA programmes or Research & Development (R&D) courses. Technology management is pervasive for an organisation, because it needs everyone's involvement from the operations people to the finance people. Kumar stressed that it was not easy to understand and practice technology, especially with respect to technology transfer, because transfer cannot just happen through papers or software – it requires extensive learning and training. He went on to outline the major elements of technology management:

- *Corporate and organisational planning for technology:* There is a need to align an organisation's business plan and technology plan. Planning for technology (or technology forecasting) is deemed to be difficult because it is hard to predict what technology will take off. Four different types of planning were defined – demand pull, supply side, and technology push. It is important to develop a technology plan that is suited to the technology's life cycle.
- *Management of technology acquisition:* The main question is to know, identify and locate possible sources of technology – technology developer or market leader, i.e. another manufacturer? Contracting R&D and joint R&D is also possible.
- *R&D management:* This comes to the fore when technology has to be developed in-house. Some issues to be considered here are cost, time frame and the risk associated with developing the technology.
- *Pricing of technology:* This is essentially determined by what buyers are willing to pay, while taking into consideration the organisation's own profit maximisation goals. The issue of whether the technology is commercially viable can also determine price.
- *Management of Intellectual Property Rights (IPRs):* Some issues to address here are the timing of a patent, what to patent and what systems are in place in an organisation to make sure its patented technology is not being infringed.
- *National policies on technology:* This involves, for example, how the Science and Technology Policy of 2003 affect technology.
- *Technology Marketing:* This involves determining how to package a technology in a way that it is of interest to the buyer.

Technology Assessment, Evaluation and Acquisition

Kumar further in his session, stated that an organisation can get technology through acquisition, in-house development, contract development or joint development of technology. Technology acquisition is preferred when the technology is too expensive or takes too long to develop and it can be acquired on attractive terms. In-house development is preferred when in-house capability exists, technology is not available elsewhere, developing the technology is time and cost-effective or there are high costs involved in acquiring the technology. He outlined the major characteristics of technology, saying that it was dynamic in nature, had varying costs and prices, is merging in nature, i.e. a lot of interdependencies exist between technologies, it had important IPR implications and mostly consists of various components, i.e. when acquiring a technology it is important to obtain the know-how and undergo training.

Kumar further mentioned there were complexities in technology acquisition that made it a tedious process. Some of these complexities are: a technology has many components; it has varying costs and prices and mostly does not have a price list; a long term relationship has to be established between buyer and seller, which, if soured, is difficult to re-establish; and technology absorption by the buyer is necessary.

With respect to assessment and evaluation of technology, some of the things that needed consideration are: suitability of technology to locally available raw materials; level of skills required to develop technology; what stage of the life cycle the technology is in; its input-output ratio; whether the technology is laboratory scale, pilot plant or commercially proven; its environmental implications; status of the technology's IPR or trademarks; national policy issues, i.e. making sure technology seller has the right to sell it; and a quantitative approach to evaluate a technology in terms of its rate of return, payback period, etc. Kumar stressed the importance of not only evaluating the technology but also its supplier on the following basis: type of supplier (manufacturer, R&D organisation, technical institute); supplier's market share; its R&D set up, ownership of technology; authority of transfer; and its reputation amongst other technology acquirers.

Session 7 and 8 – Technology Acquisition and Case Study

Vinay Kumar, Former Adviser and Head, Technology Management Division, DSIR and Visiting Faculty at IIT, New Delhi

Kumar continued this session with the complexities involved in technology acquisition, mostly outlining the risks associated with a technology's life cycle. He mentioned that in a technology's development stage, the risk in operation is high because it has not been commercially proven (and the price is low); in its nascent stage, the price is high because it is on its success path; and in its maturity and decline stages, risk in operation is low and the technology's price is also low. Kumar also said that there is considerable risk in operation and price if the technology is lab scale, pilot plant scale or commercial scale. Thus, the technology's life cycle and its type of scale should be considered when acquiring technology, in order to eliminate as much risk as possible.

After the assessment and evaluation of technology, negotiations are held in which various techniques can be adopted to formulate an agreement satisfactory to both sides. Kumar mentioned the main factors for successful tech acquisition to take place are good agreement, the right documents, trust between the parties and competence of technology supplier and acquirer. He felt that the agreement is the most important document for a successful technology transfer. There is no model agreement provided by the Indian government because of the varying characteristics of different technologies. However, international organisations have been able to present agreements that can be used as guides.

Kumar expressed that both legal and technical people have important roles to play in formulating an agreement and it should be written simply to avoid multiple interpretations, which can lead to disputes. In the event of a dispute, the agreement should provide for a satisfactory settlement mechanism. Most disputes are settled through arbitration. It is important to clearly define each term, especially the agreement's payment terms. Kumar stressed the importance of making sure there is a certain monetary reward related to what the technology achieves to ensure it delivers what its creators promised it would deliver.

Case Study: Kumar moved on to discuss a case study which looked at an agreement between a technology acquirer in India and a technology supplier abroad. Each of the participants was distributed the case study a day before the discussion. This allowed participants to read through the agreement (case study). He asked whether any of the participants could point out the strengths and weaknesses according to each Article in the case study. A few doubts from the participants relating to exclusivity and territory were cleared along the way. One of the main points that came out from the case study is that vagueness in an agreement should be avoided.

Kumar went back to answering a question that was asked earlier in the day regarding the contents of the Science and Technology Policy of 2003. He outlined some of the salient features such as greater autonomy to R&D to individuals and organisations and said it was not enforceable by law, but it provided as a guideline for the direction in which science and technology in India should move. He concluded his session by thanking everyone for their participation and said he enjoyed the exchange of knowledge.

Session 9 – Diplomacy Involved in Technology Agreements and Other Instruments

Atul Kaushik, Adviser (Projects), CUTS International

Atul Kaushik began by stating that the session is in continuation of the previous sessions. Kaushik proceeded with the content part of this session by outlining the different types of standard technology agreements, stages of technology transfer and types of licensing methods. He elaborated on the basic ingredients of a licence being what is licensed and at what price, for what purpose, for how long and under what conditions (warranties, disclaimers, indemnifications, etc.). The basic clauses in an agreement are the parties involved, subject matter, scope and territory, licensor's obligations, improvements (typically in cross – licensing where it is important to ascertain whether the partner will be able to create another product using the technology transferred), financial, infringement, period of agreement, other usual items such as accounting, applicable laws, confidentiality, definitions, etc., and the agreement's legal effect.

Kaushik further discussed about technology negotiations being different on the basis of their complexity, uncertainty, egos of the various technical and non-technical people involved and finally organisational change, which pertains to how people can be resistant to change or the new kind of skills that have to be acquired when a new technology comes into the organisation. The process of negotiations lies in understanding the value of the technology and establishing long term technical and personal relationships and these negotiations can be split into three phases, namely, preparatory, discussion and, finally proposals and bargaining. Kaushik also gave the participants some useful negotiating tips such as the importance of attitude, finding synergies in interests, knowing the position of the other side, the importance of listening, using facts to your advantage, the importance of being accurate, creasing out conflicts and following best practices. It is also important to keep a tab on timelines at the end of negotiations and this involved opening up cards at the right time.

Kaushik then answered the participants' questions on patents. Some of these questions were whether an agreement would be legally binding if signed on ordinary paper, as opposed to stamp paper, and whether a MoU is enforceable. He stressed that these requirements were procedures encouraged to ensure more security in case a dispute arises.

Session 10: A Practical Approach to Negotiations

Ashok Jain, Vice-President, Research & Academic Development EMPI School

This session dealt with practical issues involved in negotiations concerning technology transfer. **Ashok Jain,** at the outset explained the background and usual modes for technology negotiations, as against negotiations in general, the objective of which is to reap benefits from a win-win situation for all engaged parties. His presentation was structured with the following sub-heads with respective examples for each sub-head:

- Parties/stakeholders involved in technology negotiations;
- Negotiation levels in technology; and
- The content and modes of such negotiations.

Jain explained the distinctions between personnel involved in technology development and negotiations and the skill requirement for each category. Further, technology negotiations happen at the state level and industry level, which are different in terms of objectives, but nevertheless have overlaps between each other. The requirements and priorities of the state and the industry are different and negotiations have to be attuned to their specific needs. It is important that the actors and agencies and policy regimes involved in the negotiations match with the overall purpose of negotiations. For international negotiations to be successful, linkages between the stakeholders within a country should be well oiled. In other words, success in negotiations between segments within a country should precede successful international negotiations and conversely internal mismatch will lead to negotiations with outside.

It is also important that the negotiations progress in stages. Firstly, technology collaboration agenda must be arrived upon. Issues like segments should be prioritised and taking stock of political and economic environment should be sorted out. **Jain** took real examples from early technology negotiations by India to demonstrate the importance of careful planning before negotiations. He also used an arbitrary case of negotiations between India and Africa to explain the fact that technology negotiations can be successfully undertaken where other benefits like earning goodwill may feature in besides technical advancements and cooperation.

Session 11: Negotiations of Technology Transfer

Ashok Jain, Vice-President, Research & Academic Development EMPI School

Continuing the ideas shared in Session 10, **Ashok Jain** taught the nuances which are specific to technology negotiations. Apart from the difference between objectives of technology negotiations between states and industries, there could be other differences in objectives, based on different segments. He explained different segments categorised according to objectives, using a schematic diagram. Lower segments, which usually involve the interests of state, deals with development of human resources in science and technology and higher segments, which are of interest to industry, are categorised by usage of technology in developing new products and utility services.

Jain further explained in detail the major differences in objectives of different segments.

- Lower segment aims basically at human resource development, in particular, support for technical education, internship and academic exchange programmes. Visa restrictions and international laws, including World Trade Organisation (WTO) General Agreement on Trade in Services (GATS), governing free flow of professional services feature in such negotiations.
- Middle segment's aim is basically technology innovations. Patent laws, including WTO's Trade Related Aspects of Intellectual Property Rights (TRIPs) Agreement, support for collaboration in R&D for developing and sharing global public goods in the areas of agriculture, health, environment, etc., are the major aspects of negotiations in this segment.
- The upper segment is absorbed in commercial applications of innovations, product development and negotiations and basically deals with the commercial interests of manufacturing/industry and services sectors.

Getting into more specifics of the upper segment, **Jain** introduced the 5 Ms of organisation of production, viz., Machine/Know-how, Material, Manpower, Money and Markets. Corporate operates by synchronising these Ms. Using the visual tool of "Smile Curve", he showed risk minimisation behaviour of the upper segment throughout their sequencing of activities, starting from R&D, prototyping, manufacturing, selling and servicing. Using the example of India's negotiations with Japan, it was explained that getting the frontier technologies may not be the objective of the industry, but they would be better off by acquiring commercially viable options. This is particularly evident in the case of negotiations on automobile technology, which resulted in collaboration with Suzuki Inc.

In conclusion, Jain emphasised the importance of TRIPs negotiations under the WTO for technology negotiations of India in future. He identified the following areas which the participants should take note of. These areas were selected keeping in view their respective profiles and, therefore, are most likely to come across their professional life:

- R&D units of foreign companies and sourcing spin-off R&D capabilities;
- Employee embodied knowledge, trade secret laws and freedom for switching jobs; and
- Restrictions on reverse engineering.

In this interactive session, the participants raised several questions, including the issue of overlaps between IPR laws and open sourcing. The discussion threw light upon the latest trends in open sourcing of technologies and highly technology-embodied products and their implications for future negotiations.

Session 12 and 13: Sectoral Case Study – Pharmaceutical Sector

Ashok Jain, Vice-President, Research & Academic Development EMPI School

Combining Sessions 12 and 13, **Ashok Jain** involved the participants by giving a practical exercise on searching out and prioritising issues for a particular sector which needs technology negotiations. He selected the Indian pharmaceutical industry for this purpose and distributed a research article, entitled 'India's Health Biotech Sector at crossroads', which appeared in Nature Biotechnology (2007) Journal's Volume No: 25. This article deals with current issues and problems faced by small and medium-scale pharma industries in India, based on extensive case studies. Participants were asked to form three groups amongst themselves and each group was assigned to discuss the case separately and present their respective cases for negotiations.

The article touches upon all aspects of Indian pharma industry, including business goals, nature of products and services offered, product development, contract services, partnership for innovation, local and international collaborations, financial environment and business models. It finds that developing an innovative health product remains a precarious venture for India's biotech entrepreneurs. Investments in domestic biotech firms remain small, although some local investors are beginning to move into the life sciences arena. According to the article, the main barriers to development are the following:

(i) Multiple regulatory agencies delay commercialisation;
(ii) Shortage of advanced training programmes and scarcity of qualified personnel;
(iii) Public-private collaborations lack overall effectiveness;
(iv) Few Indian academics show entrepreneurial ambitions in research;
(v) Dearth of financial resources and burdening bureaucracy;
(vi) Lack of national prioritisation diverts focus from domestic health needs; and
(vii) High costs associated with domestic distribution.

The participants were divided in three groups, with a chief negotiator in each group. Each of the three groups spent one hour to deliberate amongst themselves to cull out the major issues which calls for internal and external technology negotiations for the development of India's pharma industry, so as to solve the above mentioned barriers in a systematic manner. The major negotiation platforms for the same were also identified and for external negotiations TRIPs agreement was considered. After deliberations, three chief negotiators selected from each group presented the negotiation strategies formulated by their respective groups.

The major points put forward by the groups provided solutions through carefully planned negotiations for finding new funding sources for the nascent pharma industry, by taking care of risk factors and by making attractive and innovative offers to potential investors. These innovative methods include use of venture capital, various forms of PPPs, providing access to global primary and secondary markets, usage of international insurance products, partnership formation with successful international firms by way of subsidiaries, foreign direct investment (FDI) and other forms of shared ownerships. Several novel ideas for using negotiations under the TRIPs agreement were also presented.

Commenting upon the presentations, **Jain** lauded the efforts of the participants and said that these kinds of ideas must come from the scientists and should become inputs to trained international negotiators. For this to become a reality, the scientists must keep themselves informed and updated about both the requirements of technology negotiations in their respective fields as well as the developments in the platforms for negotiations. In conclusion, he answered several questions raised by the floor regarding recent developments in national level negotiations and also encouraged the participants to put their learning into practice in their respective professional careers.

Session 14: Simulation Exercise Case Study

Atul Kaushik, Adviser (Projects), CUTS International

The session focused on practical application of the knowledge disseminated to the participants in the previous days of the workshop about negotiations. During previous day's session, the participants had been divided in two parties: Indico Company Limited (Indico), an inventor firm based in Mumbai, India, and Chemical Formulations Incorporated of Florida, US (Chemical), leading pharmaceutical firm which is trying to buy out Indico's newly invented method of coating microscopic components. The aim of the activity was that these two groups discuss within group and negotiate with other group and exchange language which can be put together as an agreement. By the end of a one-and-a-half hour discussion, they should have a mutually agreed upon deal.

Before starting the negotiation process, the teams took around 10 minutes to discuss within their groups to finalise their stands. Indico focused on the money deal to be agreed upon by the two parties, whereas Chemical persisted with deciding the framework of the module being patented.

After the rigorous discussion led by the chosen leaders of the two parties, with the Chief Finance Officers and MDs supporting the negotiation, the following *four points of agreement* were reached:

1. For the application of this product, Indico will provide the technology covering only one compound under discussion. Chemical will be preferential partners for other

compounds, or in other fields of applications. Right of first refusal shall be retained by Chemical for subsequent applications and developments.

2. Indico will provide technology, know-how and training to Chemical employees. Indico will carry out testing at laboratory level and explain it to Chemical employees at lab level. Also, the technical know-how will also be disseminated by Indico employees to Chemical employees at industrial level, all expenses borne by Chemical. The warrantees and other responsibilities will be Indico's at laboratory level and post that level will be shared jointly.

3. The raw invention will be patented by Indico, but for any improvements which will be done by Chemical to their product using Indico's product will be patented by Chemicals.

4. A lump sum amount of US$0.5mn and subsequent three percent of the company's revenue from the sale of the product as royalty to be paid by Chemical to Indico for the molecule.

The session was concluded with the evaluation of the negotiating process. Team Chemicals Inc. succeeded in obtaining an agreement at a price lower than the initial offer by team Indico. Also, there was a new development wherein Indico's senior researcher, Sandra Eureka, agreed to join Chemicals Inc., which led to the extended debate about the employment contract and confidentiality contract. The activity assisted the participants in understanding the negotiating process and in appending their own skills.

Also, team Chemicals, which seemed to be less prepared at the initiation of the negotiating process, turned out to be victorious at the end of the process, as they focussed more on the scope of the contract and the rights and privileges that it will offer to their company regarding the product's future as well as were able to crack the deal at a price lower than the initial offer.

Session 15: Analytical Presentation

Atul Kaushik, Adviser (Projects), CUTS International

On the request of the participants, this session was conducted on developing an understanding of *Drafting a Patent*. The presentation first defined patents and the criterion of granting one on the basis of novelty, inventive step and industrial applicability. Then, the focus was directed towards drafting process of a patent application and discussed in detail the various parts of an application like title, field of invention, background, prior art, objects of invention, detailed description of invention, drawings and claims. As was discussed, detailed description of invention is a tricky part of the application, because what applicant discloses at first about invention is important. This information cannot be amended and correction of mistakes is also not possible. Claims in the application are particularly an important section of the application, as it defines the monopoly to be conferred by the patent. Moreover, for the purpose of infringement proceedings, only claims are interpreted to make decisions.

In addition to delivering the documented information on patent application, the presentation also provided certain tips for filing chemical patents. Also, in order to ensure that the participants learn actual drafting of the patent application, a practical example of wooden box with walls and a base was discussed at length in the session, which clarified the whole process further for the participants. The queries of the participants reflected that the exercise was well-received and the members of the workshop gained from it.

Session 16 and 17: Excursion Tour

By CUTS International

These two sessions consisted of an excursion tour to a local industry, namely, Mann Structurals, Jaipur. It is a steel factory and has entered into technology agreements with other country steel industry such as Japan. The participants were taken to the factory premises as well as were introduced to the concerned team of officers who were essentially technically oriented and were responsible for not only advising the technology agreements but also were part of negotiations. The participants also took a tour of the entire steel factory, understanding the various new technologies acquired through such agreements. The tour enabled the participants to understand the nuances of technology as well as the diplomacy involved in the technology agreements, etc. Thus, it was a useful exercise and the efforts of the organisers were well appreciated by the participants.

Session 18 - Values and Visions

Vandana Sharma, Jaipur Finishing School

Vandana Sharma began her very interactive session by stating that as an employee of an organisation, it is important to know about the organisation's values and visions so that the objectives are achieved. There were two case studies to be read for the session. Sharma split the participants into groups of four, so that they could discuss the cases and then present their respective group's views by designating a group spokesperson.

The first case was about the dilemma faced by a recruiter of a recruiting firm which has been appointed by one of the US's leading companies to recruit a President for it. The recruiter sees that the recruiting process is flawed, as the company's Board of Directors has left the decision to the CEO, who seems to be looking for someone who will be deferential towards him – something that will not attract highly qualified people for the position of President. The recruiter speaks to his superior and she advises him against bringing the issue up with the company's Board of Directors. The case study asks what the recruiter should do. The points raised by the groups mostly revolved around the concept of values and the view that the recruiter should, in fact, talk to the Board of Directors.

The second case was about a company called Columbia Motors looking to set up a firm in a foreign country, where people are split up into three groups. The settlers have the most power and wealth; the immigrants have mostly set up small businesses; and the natives have the least wealth and power and were mostly engaged in manual work. There is no interaction between these different groups. The case study questioned what company's policies should be towards workplace facilities, such as cafeterias and rest rooms; pay scales; availability of training programmes for more skilled positions in the plant; promotion policies; benefits programmes, such as health coverage or tuition reimbursement; and charitable donations to community projects (CM likes to make charitable contributions in the countries in which it has plants). Almost all the participants agreed that there should be some favourable policies for the natives. Sharma pointed out that organisational values are important and vary from organisation to organisation and these are inextricably linked to business ethics.

Sharma, in her presentation, mentioned that ethics are the ways and means by which the organisation's mission, vision and values are carried out and that they provide a yardstick that can be used to compare present performance and plans with the aspirations. She went on to

define mission, vision and values and describe the relationship between ethics and values. Ethics in negotiations revolves around questions such as: when does puffing become misrepresentation, is it ever appropriate to lie, can silence be unethical and can we remain intentionally ignorant.

A few tips on how to negotiate were also shared. Negotiation in diplomacy is dependent on interests of the parties, options, alternative actions to take if demands not willing to be met, legitimacy in what persuasive criteria can be used, effective communication, relationship building and the type of commitments that should be made. Sharma concluded the session by saying that the mission, vision, values and ethics statements should identify: context of the work, intended outcomes, aspirations, value of the work and principles that guide the work. She said an organisation should make informed planning decisions and make an assessment of success, while it was the individual member's responsibility to express and perpetuate the culture of the organisation through one's work.

Session 19 – Stress Management

Vandana Sharma, Jaipur Finishing School

Sharma, in this session, distributed the participants a case study about a single parent with an eight year old daughter. The case study was about how the parent balances home and work responsibilities and requested each of the participants to record notes on his stress and the ways in which it can be reduced. The discussion that ensued highlighted the major factors causing stress as being time management issues, high expectations from self, being stressed about the upbringing of the child, dissatisfaction at work but unable to do anything about it due to uncertainty, social obligations and long commutations to and from work. Some of the suggestions on how the situation can be improved were: manage time better, the need to appreciate self more, shifting residence closer to work and yoga and meditation.

Sharma, in her presentation, looked at the general awareness required to manage stress, such as understanding stress, symptoms and internal and external sources of stress, etc. The major approaches to handling stress were action-oriented, emotionally-oriented and acceptance-oriented. Stress caused emotional disturbance (depression, tearfulness, fits of rage, etc.), disruption of thought processes (memory lapses, confusion and disorientation, etc.), physical discomfort (nausea, dizziness, infections, palpitations, etc.), and behavioural changes (loss of appetite, nail biting, increased intake of alcohol, nicotine, etc.).

There are positive effects of stress where stress can spur motivation, provide stimulation to coping with challenging situations and there are negative effects of stress where it can be a contributory factor to minor conditions such as headaches, insomnia and digestive problems. The ABC strategy on handling stress was discussed, where A=Awareness, B=Balance and C=Control. Ways in which one could de-stress were suggested. Some of these were physical exercise, healthy eating and drinking, relaxation techniques and diversions.

Sharma, while concluding the session, hoped that the participants benefited from her sessions.

Session 20 – Evaluation of Programme and Suggestions

Atul Kaushik and Archana Jatkar, CUTS International

In the closing session, the need to have strong technology diplomacy in developing countries like India was reiterated. Although a lot of development has occurred in this field, yet a lot needs to be done, especially in India, and this also offers great opportunities for promoting our growth and development.

Participants were requested to provide feedback on the training programme. They were of the opinion that the training programme provided them with better understanding and exposure to technology diplomacy and related issues. They appreciated and acknowledged the rich experience and expertise of resource persons, quality of resource material and overall administration of the training programme. Most of the participants expressed their interest in attending similar training programmes of longer duration in the future.

At the end of the training programme, Atul Kaushik and Archana Jatkar thanked all the participants and resource persons for their valued participation and contribution to the success of the training programme. They thanked the Department of Science and Technology for assigning CUTS this training programme and assured that the future programmes will take into account the suggestions. He also thanked his colleagues for their hard and diligent work.