

**Event Report of
Training Programme on
Technology Diplomacy**

November 14-18, 2011, Jaipur, India



CUTS International

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Contents

1. Executive Summary

2. Inaugural Session 1

3. Session 2 & 4.....

4. Session 3

5. Session 5

6. Session 6

7. Session 7 & 8

8. Session 9

9. Session 10

10. Session 11 & 12

11. Session 13

12. Session 14

13. Session 15

14. Session 16

15. Session 17

16. Session 18

17. Session 19

18. Closing and Evaluation.....

Executive Summary

CUTS CITEE¹ organised a training programme on “Technology Diplomacy” from November 14-18, 2011 in Jaipur 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 and will play a vital role in the economic development of countries. Given the increasing inter-connectedness between the nation-states, technology acquisition/promotion has become an important part of international relations. In recent years, the pace of technological development has increased manifold and it has significant implications on international trade. More than 60 percent of today’s trade occurs between firms (intra-industry trade) and it is proved that technological advancement is the most important driver of intra-industry trade.

Given this importance of technology in our future economic development and the increasing level of India’s outwardness, it is important to develop the skills and knowledge of our negotiators (especially those who are engaged in negotiating comprehensive economic agreements in general and technology agreements in particular) on various aspects of technology diplomacy.

Unlike their counterparts in developed countries, negotiators and policy makers in developing countries often lack understanding underpinning science and technology promotion and agreements therein. It is true that science and technology is a specialised subject and most of our negotiators come from a general knowledge background. The question is how we bridge this gap.

One approach of bridging this gap is to develop the skills and knowledge of our negotiators (mainly from foreign affairs and trade ministries) on various aspects of technology diplomacy (technology promotion/acquisition, etc). Second is to get inputs from our scientists and technologists on their areas of expertise and then blend them with the nuances of technology diplomacy.

This programme, supported by the Department of Science & Technology, Government of India and implemented by CUTS International, is an endeavour which is based on the second approach of bridging the gaps between our scientists and technologists and those who are engaged in international (bilateral, regional and multilateral) negotiations on comprehensive economic cooperation agreements, in general, and technology agreements, in particular.

Ideally, this programme should be a blend of participants from among the scientific/technologist community and the negotiating community. However, and for practical reasons, it is targeted to our scientists and technologists who are working in various ministries/departments of the Government of India and their affiliated institutions. CUTS takes the responsibility of sharing the inputs (on technology acquisition/promotion and related matters) from our scientific/technologist community with our negotiating community.

Over a period of five days, this programme will cover a range of issues – from basics of technology diplomacy to technology promotion, technology sourcing and assessment to the application of

¹ CUTS Centre for International Trade, Economics & Environment (CITEE) was established in 1996 with an aim to be 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

intellectual property rights (IPRs). Case studies and simulation exercise will be conducted to impart practical skills and knowledge. A number of subject-specific experts will be engaged to deliver this programme.

Session 1: Opening and Inauguration and Understanding Participants' Expectations

Bipul Chatterjee, Deputy Executive Director, CUTS International & Head, CITEE

Bipul Chatterjee welcomed the participants to the training programme and introduced CUTS International. He shared with the participants the journey of CUTS which started in 1983, as an organisation to protect consumer interest and since then has moved on addressing a gamut of issues. International trade is one of CUTS main focus areas, especially in the field of IPR, regulations, environment among others, based on CUTS wide experience in this area the Department of Science and Technology entrusted CUTS with this programme.

Chatterjee introduced the distinguished resource persons who would be conducting the training programme and requested participants present to share their expectations from the programme.

Anthony De Sa, Director, United Nations Industrial Development Organisation (UNIDO) Centre for South-South Industrial Cooperation, mentioned that the training programme would give a context to all the knowledge the participants have on technology diplomacy. Over the next five days, participants would get a chance to see different viewpoints which would help broaden the understanding.

Deepak Bhatnagar, Head, Centre for International Trade in Technology, congratulated CUTS for conducting the training programme. He mentioned that this programme is more about sharing experiences and learnings from each other, rather than a discourse on technology diplomacy.

Expectations of participants are summarised below:

- To catalyse technology development and commercialisation through collaborative research
- To better understand and negotiate technology acquisition and development
- To gain knowledge of patents in general, drafting and filing of the same
- To gather information and understand technology sourcing and related issues
- To gather information about IPR and related documentation
- To better understand the intricacies of technology transfer and negotiations.

Session 2 and 4: Basics of Technology Diplomacy and its Importance in International Relations & Interface between Technology Diplomacy and Political/Economic Diplomacy

Anthony De Sa, Director, UNIDO Centre for South-South Industrial Cooperation

Anthony De Sa, in his presentation discussed various aspects pertaining to diplomacy, including meaning and need of technology diplomacy – its importance in international relations, tools, techniques; advantages and disadvantages; and various parameters.

He mapped out the changing role of diplomacy in geo-politics. The period after World War II, the focus of diplomacy was security; transfer of war technology was the thrust during this period. It then moved to financial aid, primarily through Bretton Wood institution, understood the economic aspect of diplomacy. This trend moved to trade through the WTO and the rise of FTAs in the world order. Following which is the new trend is now based on input of science and technology cooperation. Importantly, this new trend has moved from assistance to cooperation.

Sa stated the importance of understanding global concerns which shape diplomacy. He discussed that technology diplomacy and diplomats combined together, should seek to achieve these basic objectives of transfer of technology; flexibility for use of technology in accordance with national priorities; and international norms and standards setting. He further discussed the importance of communication between various ministries and the science department, to provide solid scientific data to back up claims to better negotiate. He stressed, that technology diplomats along with participation in the

international sphere there is a need for greater participation in domestic policy making, to make our efforts more credible in international negotiations. He focused on the need of technological diplomat upgrading their knowledge to be at the cutting edge of their field, this better help negotiation.

Sa discussed how the scope of technology diplomacy has expanded with the advent of technological progress and today it covers much wider issues in variety of areas than before. This has led to new areas of concern at the international level such as environment, e-sphere, food security, education and energy. Other areas of work for technology diplomacy include security, industry and health.

He introduced the participants with the UN system and its various institutions such as United Nations Environment Programme, United Nations Educational, Scientific and Cultural Organisation, UNIDO, Institute of Asian Studies, International Telecommunications Union, Food and Agricultural Organisation, and others which are playing the role of a diplomat/facilitator to promote cooperation among countries on emerging issues. He also explained commonly used economic and trade jargons (multilateral; plurilateral; bilateral; North-South; South-South; emerging economies; economies in transition and others) and global trading system which have gained prominence these days, and how the tasks of diplomats have become more challenging now as they have to deal with different types of negotiation requirements. He then elaborated the difference between a developed and developing country, although there is no precise demarcation which exists, this is largely self-designated, within the group of developing countries; there are least developed countries which have special privileges.

While discussing the global trading system, he touched base on the Doha Development Agenda, which addressed the developing country concerns at the WTO and issues pertaining to agriculture, non-agricultural market access, environment and Trade Related Aspects of Intellectual Property Rights (TRIPs) at the WTO multilateral negotiations.

He went ahead to point out the factors limiting the technology of transfer and the positive and negative impact of standards, as standards can either raise or lower barriers and can speed up the diffusion of technology or constrain it depending on the ulterior motives behind setting up of standards.

He pointed out science and technology play a role in both diplomacy and development by finding viable approaches and solution backed up by hard scientific data and can reap peace dividend. Anthony De Sa concluded by pointing out the emerging issues in technological diplomacy in India as below:

- Need for a technological diplomacy policy
- Dislocation in a technology back up
- Reforming the diplomacy apparatus, and
- Track 2, technological diplomacy

Session 3: Historical Perspective and Approaches to Technology Diplomacy

Deepak Bhatnagar, Head, Centre for International Trade in Technology

Deepak Bhatnagar began his presentation by pointing out the importance of technology, which forms the link between the scientific lab and the industry. Technology is the thread which translates an invention to an innovation, which can be used by the industry. He explained that diplomacy is not only about negotiating but spreading the knowledge. In his presentation, 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. He then stated technology diplomats of India in recent times have emerged as important players in global technology diplomacy and mentioned few names of the diplomats such as Dr Sanjay Gupta, now with the 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 Chandrashekar and Venkataraman.

He further discussed the beginnings of science in India, the shift from 'food-gathering' to 'food-production' and the positive influence of foreign invasion and trade on the development of science in India due to the intermingling of races.

In his presentation, he pointed out the need for technology diplomacy in India, as the perspective of India changing from a cultural hub to a business hub, the projection of India's technological capabilities have been subtle so far and the trend is that negotiation plays a key role in major science and technological fields.

He discussed the role of science and technology in international diplomacy and trade. Bhatnagar underlined two key features in international negotiations: i) Scientific knowledge becoming increasingly specialised demands greater expert input into international negotiations; and ii) the application of science and technology to development requires the ability to integrate the divergent disciplines to solve specific problems. Young scientists need to have both specialisation and the ability to integrate divergent technologies.

Bhatnagar pointed that the discipline of science is consistent across all geographical boundaries; hence there is a need for collaborative research. Conducting joint research is one of the biggest challenges for technology diplomacy today. He also informed the participating scientists that the Government of India has several programmes under various departments to promote excellence in research-related activities and young scientists should prepare themselves to exploit such opportunities. He also oriented participants with various collaborative efforts such as India-EU 'India Gate' project, joint ventures of cooperation in science and technology with US and various other initiatives.

Bhatnagar congratulated CUTS for its effort to promote training on this subject and enumerated various initiatives undertaken by several inter-governmental bodies such as United Nations Cooperation on Trade and Development, United Nations Commission on Science and Technology for Development (UNCSTD) in technology diplomacy.

He pointed out the importance of science and technology cooperation in international relations, and cited the example of Indian Space Research Organisation in Mauritius which helped generate employment and transfer skill and technology from India to Mauritius, highlighting the positive spill over effects of technology on an economy. He concluded the discussion by highlighting the issues of flow of 'useable' knowledge between north to south and policies should foster Indian scientists to be at the forefront of technological invention and innovation.

Session 5: Technology Promotion – Role of Ministries, Departments, and Missions

Ambassador Bhaskar Balakrishnan, Former Ambassador to Greece

Ambassador Bhaskar Balakrishnan, in this session, discussed the ways in which science and technology can work with the rest of the government machinery to increase the efficacy of technology diplomacy. He said that technology is a crucial determinant of national competitiveness in geo-economics and politics, technological advancement can vastly increase military and economic strength of a nation. Technology is a moving paradigm hence it is an on-going process of invention and innovation which is protected by the IPRs.

Balakrishnan mentioned that the international relations have evolved over the years it is beyond political affairs to a gamut of organisation and countries get involved, the role of the diplomat has widened and involves interactions with a wide body of people, through track one and two diplomacy.

In his presentation, he further elaborated on the conceptual framework of the Indian foreign policy that was laid down by Nehru, the basic idea was India should not be entangled with any one bloc, should have the freedom to develop its international relations in its own way and should promote development objectives of hers' through international relations. The framework which Nehru

developed worked well, but had problems, principally with our two neighbours Pakistan and China. Today, with new poles of power emerging, EU, Japan, China and new issues which are to be addressed which have posed some challenges to the existing framework. He then discussed the inter-linkages between international relations and technology. Power, both hard and soft plays an important role in international relations and technology plays a key role in determining power of the nation.

Balakrishnan discussed the pre-conditions to determine technological strength, the need of educated skilled human resource, practical application of scientific knowledge, requires mastery over hardware and to have the ability to apply and innovate and think beyond limits. There is a need to change teaching method to foster innovation among their human resource.

He pointed out the challenges for developing countries and developed countries and the need of collaborative research. He highlighted the importance of technology promotion which plays an important role in technology management. Technology and diplomacy are intertwined especially for sensitive technologies, to prevent technology leakages to hostile states and entities among others. With the signing of the TRIPs agreement has further strengthened the bargaining power of owners of technology. In this complex world of technology, international relations and diplomacy, he said it is important to harness synergies, to deal with dissemination of technology. He discussed the roles national entities, Ministry of External Affairs and Missions abroad have to play to promote technology. He presented some of areas science and technology which are emerging and needs coverage. He discussed in detail specific problems pertaining to nuclear technology, missile and aerospace technology, chemical weapons convention, IT and security issues, technology control, IPRs, biological weapons convention, biotechnology and the ICGED, biosafety and GE issues, environmental issues, and nanotechnology.

Balakrishnan cited various examples of science and technology systems used by the US, the UK, Italy and Denmark. He highlighted the importance of collaboration in technological progress and cited the example of CIM (Cuba) and Biocon a JV where bio-pharmaceuticals facility was set up, the product BioMab EGFR launched in 2005, is a novel monoclonal antibody against head and neck cancer and other cancers of epithelial origins. He also cited examples how restrictive practices can hinder technological innovation and progress.

He further discussed the importance of international scientific collaborations and elaborated on various examples of the initiatives which are taken by the international scientific community, like the EU's Seventh Framework Programme for Research (FP7) among many others.

Balakrishnan sketched out a framework of bilateral cooperation and concluded by highlighting the increasing role of technology issues in India's foreign relations as India is growing as a producer and consumer of technology and is participating in more collaborative research, this would require closer collaboration between foreign affairs and scientific and technical establishments and global issues will have to be taken into account.

Session 6: Negotiations of Technology Transfer

Ashok Jain, Vice President, Research and Academic Development, EMPI School

Ashok Jain stated that the objective of his presentation was to simplify the entire jargon around technological diplomacy and give a framework in which different aspects of technology diplomacy can be analysed. He said that the goal of negotiation is to have a win-win scenario, the two parties should not only know their own strengths but also the strengths of the other party, if these are unknown, possibility of negotiations to fail is greater. He explained that technology is about "know-how", but to make it work, one needs to understand the feasibility of it. Capability of the technology developer and of the person applying this is an integral part of negotiation. To go unprepared about different actors who are involved in the negotiations is one of the basic mistakes which make negotiations to fail, hence one has to be thorough in his/her homework.

Jain elaborated that negotiations are held at the macro level (which is the national level) and the micro level (which is the individual organisation/industry level). Negotiating is a win-win game involving different actors and understanding of each other's capabilities and stage of development they are placed will only help bridge the macro and micro divide.

In negotiations, there are several elements that need to be linked with each other in order to have a successful outcome. These linkages are sometimes termed as the national innovation system. While categorising, he further explained that the top segment is the manufacturing industry, where the technology is being applied; the middle segment (science research) is important as it connects R&D with manufacturing; and innovation falls between these two segments; at the bottom is the science and technology infrastructure and human resource that carry out the scientific research. In negotiations communication between different levels and their different actors is quintessential for inventions to transform in technology and innovation. Linkages between these segments need to be strong in order to serve the national interest especially in international negotiations. In international negotiations Embassy plays an important role in transferring information at the high level and with coordination among the levels within the national framework can deliver a positive outcome. Jain cited example of Japanese technology negotiators as having a solid understanding of these linkages, as compared to their Indian counterparts.

In his presentation, Jain discussed the importance of five 'Ms' that go into production. He explained the importance of the need for synchronisation between these Ms and how this can lead to successful negotiations: know-how suppliers (M1), material suppliers (M2), manpower suppliers (M3), financiers (M4) and marketing and servicing agents (M5). He pointed out the importance of understanding the level of technology where the industry is currently poised in negotiations, lack of understanding of the level of technology development in industry often lead to failure as there are expectation mismatches.

Jain further discussed the issues pertaining to the TRIPs and the potential rights such as geographical indication, patents is where India could capitalise, and highlighted the importance of discussing the undisclosed information like human mobility as lot of the knowledge at present is immobile via secrecy clause etc. to foster dissemination of scientific knowledge.

Jain concluded the presentation by highlighting the importance of understanding cultural subtleties especially in international negotiations. He discussed the importance of understanding client's motivation, both as a buyer and a seller to create a win-win situation for both and enumerated these motivations in his presentation.

Session 7 and 8: Simulation exercise on Negotiations on Technology Transfers and Discussion

Ashok Jain, Vice President, Research and Academic Development, EMPI School

In this session, Jain divided the participants into five groups randomly and asked them to discuss among themselves, a technology which they would like to offer as a seller. They would also have the chance to act a buyer to one such technology, which they choose to negotiate. The groups came up with five different technologies, which they were offering as seller, which were: motors (6600V); new generation semiconductors; uranium exploration and mining technology; natural sweetener; and online surface inspection system for steel plants. Then the groups selected as buyers which technology they would like to negotiate and also stated the country from which they belong, to take into account the international spectrum of negotiations.

The groups formulated negotiation strategies and negotiated with the buyers. The major points put forward by the groups provided solutions through carefully planned negotiations for finding new funding sources for their product/industry by taking care of risk factors and making attractive and innovative offers to potential investors. Participants at the end of the negotiations rated the negotiations other than those they were involved which took place in the session as to how it fared. The following scores were calculated on the scale of one to five, one being the lowest and five being

the highest. The motors (6600V) negotiation scored 3; the new generation semiconductors negotiation scored 3.5; the uranium exploration and mining technology negotiation scored 4; the natural sweetener negotiation scored 3.5; and the online surface inspection system for steel plants negotiation scored 3.

In conclusion, Jain enumerated the diversity of negotiations which took place in the session, as consultants, joint ventures, technology transfer and other possibilities in technological diplomacy. He highlighted the importance of considering the five M's in negotiation and breaking down complex problems to have better results. In the end, he urged the participants to put their learning in practice in their respective professional careers.

Session 9: Values, Visions and Stress Management

Vandana Sharma, Soft Skill Expert

Vandana Sharma opened the session with an interactive session, she discussed the case study of the recent incidence of allegations against Rajat Gupta for insider trading, eliciting the views of the participants and highlighted the importance of values in one's life.

Sharma, then carried out a group exercise and requested participants to fill out a 'Vision Setting Sheet', a vision of what they see for their organisation, department and themselves in the coming one year, three years and ten years and further asked them to discuss among themselves these visions briefly. Sharma then opened the floor for each group to briefly discuss their vision and highlighted the importance of communication between the organisation, department and the person for the successful implementation of their vision, the need for a focused approach to the goals they have envisioned and the importance of breaking down a macro-vision at the organisation to workable targets at the individual level.

Next, Sharma, requested the participants to fill out a 'Value Definition Sheet' later to better understand the values of the organisation and the expected behaviour of the individuals working in the organisation. Values play an important role in translating the vision to reality, they give clarity to the goals and clarity is quintessential for achieving the goals.

Vandana Sharma discussed at length about stress and explained the meaning of stress and various reasons behind it. She started out with an exercise of holding out a glass of water at the arm's length using this analogy she explained the three stages of stress - first being the alarming stage, this is the first stage where the body gives initial indications of stress, the second being resistance, where the mind resists to accept these alarming indications and the final stage being exhaustion, where the body is completely exhausted. The basic problem, she pointed out is that one does not identify stress. To help identification, she showed ways to understand stress, symptoms and internal and external sources of stress. Sharma categorised stress into three types: action-oriented, emotion-oriented, and acceptance-oriented. She mentioned that stress causes emotional disturbance which comes from depression, tearfulness, fits of rage, etc. To tackle stress, several activities were suggested such as regular physical exercise, healthy eating, maintaining a work-life balance, yoga and other relaxation techniques. She concluded by highlighting the importance of trust in reducing stress, as most of our stress is caused in the anticipation of inaction by others, learning to trust others will definitely help one in reducing stress in their lives.

Session 10: Technology Sourcing (including Technology Acquisition) and their Assessment

Vinay Kumar, Former Advisor & Head, Technology Management Division, DSIR and Visiting Faculty, IIT Delhi

At the beginning of the session, Vinay Kumar thanked CUTS for inviting him as a speaker and appreciated the initiative of the Department of Science and Technology and CUTS. During a round of self-introduction participants once again highlighted their areas of work and also expectations from

the programme. This session was interactive in nature and the queries raised by participants were answered, as and when they arose.

Vinay Kumar said the market for technology sourcing is more liberated than earlier. Now it is observed that import of technology is allowed by the government, even if a similar technology is available in the country. This is, however, done on some specific ground. Two of these factors used to allow import of technology are (i) it more environment friendly, and (ii) it is more advanced than what is available in the market.

Deliberating on technology sourcing, Kumar said it is evolving at a faster pace and becoming increasingly important for industry. Some of the challenges faced by industries relating to technology are: shorter life of cycle of technology; intense national and international competition; emergence of global market for technology; emergence of quality, cost, delivery, after-sales service, international standards as important issues; IPRs; high risks in investments; shorter time between innovation and commercialisation; growing importance of research and development; growing need for energy efficient and environment friendly technologies; socio-economic issues; and increasing movement of capital across national boundaries.

There are various old and emerging challenges that make science and technology sourcing all the more important. These are also important for the sustenance of human civilisations. Some of these include:

- Increase in number of infectious diseases, environmental concerns, ICT, biotechnology, and use of electronics in crime;
- Growing international trade in commodity and technology;
- International standards setting in the field of trade, safety and environment;
- Growing international cooperation in manufacturing research and development;
- Need for foreign direct investment; and
- IPRs issues

As a result of emerging dynamics, Kumar said, there is a paradigm shift in the way technology is perceived today. The market for technology is getting transformed from sellers' to buyers' market. Today supply of technology has increasingly become integrated with demand from industries and other users. Even R&D centres are acquiring status of business like entities. As a result of this, expectations from R&D have increased substantially.

Furthermore, he apprised that India has been looked upon as an important partner on the global R&D platform. This is because of presence of a large number of laboratories, wide technological network, highly qualified and skilled manpower, growing domestic market, well established corporate infrastructure, strong IT expertise, and strong design and manufacturing base.

Vinay Kumar further deliberated comprehensively on technology sourcing and expressed that there are various routes through which information about technology can be sourced or accessed. These include exhibitions and conferences, international organisations, industry/technical journals, industry associations, government sources, patent literature, international agreements, foreign embassies, experts and consultants, and others.

At the end of the session, Kumar said, technology sourcing is important but more than this it is important to ensure that it is successful and achieves its objectives. Some of the factors that make technology sourcing successful is good agreement and documentation; mutual trust; competence of technology supplier and acquirer; effective training; existence of mutual interests; and proper planning. These need to be properly planned and executed, Kumar said.

Session 11 and 12: Simulation Exercise on Technology Sourcing/Acquisition and their Assessment & Presentations from Simulation Exercise

Vinay Kumar, Former Advisor & Head, Technology Management Division, DSIR and Visiting Faculty, IIT Dehi

At the beginning of the session, Vinay Kumar explained three players in the technology market who lend success to a technology. These include:

- Developers
- Manufacturers, and
- Users

He elaborated on the importance and role played by each of these players in making a technology successful. He mentioned that the need to have proper and effective coordination between these players is essential for a technology to be successful.

Further in the session, participants were divided into four groups and given two case studies to conduct a practical exercise on specific aspects of technology sourcing/acquisition and their assessment. While two of the four groups acted as buyers, the other two presented themselves as sellers. Each of the groups presented its position with its counterparts separately. The presentations made by each of the groups highlighted major areas of discussions leading to agreement/disagreement. This exercise focused on seller and buyer of dishwasher technology. The presentations made by the participants covered the following points:

- Identification of need for technology by the technology receiver
- Make or buy decision for technology by the receiver
- Assessment of technology
- Assessment of technology supplier and technology receiver
- Exclusivity/ non-exclusivity of transfer
- Duration of the agreement
- IPRs issues
- Price of technology
- Dispute settlement mechanism, and
- Supply of components

The session, overall, was highly interactive and interesting.

Session 13: Trade and Technology Transfer with Simulation Exercise

James Paul Daniel, Senior Expert, Investment and Technology Transfer Promotion Unit, UNIDO

This session by James Paul Daniel provided participants with a practical viewpoint on trade and technology transfer. It focused on four key aspects and covered issues such as organisations engaged on the subject and their efforts for technology promotion; economics of technology; international trade trends; and technology policy and diplomacy.

He began with a brief introduction of UNIDO methodology relating to technology acquisition and transfer so as to provide practical understanding on issues. He explained five issues that need to be considered in assessing the need for technology acquisition and transfer. These are identification of sectors; technology needs survey; technology awareness programmes, financial evaluation; and international matchmaking.

Daniel shared his real time experience on technology acquisition and transfer in footwear industry. He also gave an account of projects that were carried in the area of technology acquisition and transfer with respect to Indian footwear industry.

He summed up his presentation by highlighting the major trends in technology acquisition and transfer. He further underlined following key issues under the prevailing conditions. Some of these include:

- Economics play a key role in diplomacy
- There are certain technology providing countries and certain buyer countries

- Usually companies enter into contract to access/share technology
- Technology acquisition and transfer is guided by different factors such as technology price, labour capital ratio of the technology, environmental hazards, etc.
- Training the industry associations in identification of needs of SMEs, and connects them to right technology provider and investors.

Session 14: Overview of Intellectual Property Rights and their Role in Technology Diplomacy

T C James, Director, National Intellectual Property Organisation (NIPO)

In this session, T C James provided an overview of IPRs and the role played by IPRs in transfer of technology. The session began with the meaning of IPRs, followed by history of emergence of IPRs. While explaining the concept of IPRs, James described the meaning in general of the term ‘property’ and then went on to elaborate on the definition and nature of intellectual property. He explained in detail various conventions and treaties which cover IPRs such as Paris Convention for the Protection of Industrial Property 1883, Berne Convention for the Protection of Literary and Artistic Works 1886, International Union for New Varieties of Plants (UPOV) 1961, 1972, 1978 and 1991, Convention on Biodiversity, 1992, Agreement on TRIPs 1994 and Internet Treaties 1996.

James elaborated on various categories of IPRs which are broadly covered by various mentioned Conventions and TRIPs Agreement - Copyright and Related Rights, Industrial Property which includes Patents, Industrial Designs, Trade Marks Geographical Indications, Layout Designs/Topographies Integrated Circuits, Trade Secrets and Protection of New Plant Varieties. James thereafter explained in detail each of the above IPRs viz definition, characteristics, term of protection, exceptions by citing appropriate examples. He further explained the two organisations dealing with IPs the World Trade Organisation (WTO) and the World Intellectual Property Organisation (WIPO).

The next part of the session focussed on the role of IPRs in transfer of technology. He explained technology transfer as an assignment of technological intellectual property, developed and generated in place to another through legal means such as technology licensing or franchising. Some of the relevant provisions contained in the TRIPs Agreement on technology transfers and IPRs were discussed. Further, James explained about licensing and technology transfer *vis-à-vis* IPRs and expressed that licence is a permission granted by an IP owner to another person to use the IP on agreed terms and conditions, while he continues to retain ownership of the IP. It creates an income source and establishes a legal framework for transfer of technology to a wider group of researchers and engineers.

James called technology transfer as an investment and mentioned that investors are guided by economic rationale of maximum returns. They do not want expropriation of the technology and will try to prevent competition. He said that accessing technology is not difficult as it is available on the internet. In this context, he cited examples such as a US survey of 1988 shows that 42 percent firms considered patents very important and 27 percent moderately important in technology transfer. Other factors like economic environment, capacity of domestic firms to absorb technology and market conditions are also very important.

In conclusion he also pondered over if licensing is profitable and quoted several examples of profitability and licensing agreements of various companies such as IBM, Texas Instruments and so on.

Session 15: IP Asset Valuation and IP Audit

T C James, Director, National Intellectual Property Organisation (NIPO)

TC James gave a general introduction of the concepts of IP Valuation and Audit. He briefly explained IP valuation and definitions of assets, IP assets, value and IP valuation, the difference between various methods deployed to value IP assets, IP audit, the preparations, procedures and results of an IP audit.

James defined an asset as a resource controlled by the enterprise which is a consequence of past events and from which future economic benefits are expected to flow to the enterprise. There are two types of assets, tangible and intangible. He apprised that IP assets come under the intangible assets and are more knowledge based.

James elaborated in detail on the factors driving the IP. He said IP derives its value from a wide range of significant parameters such as market share, barriers to entry, legal Protection, IP's profitability, industrial and economic factors, growth projections and new technologies. He also touched upon the risks involved with IP assets and the means of handling it.

He further explained the various uses and benefits of IP valuation such as it can provide a better idea of the overall value of the business, can be a tool to measure and manage assets, provide security and backing for lenders, taxation benefits (taxation deductions) and so on. He further broadly explained the valuation methodologies - Transactional/Market Approach, Cost Approach and Income Approach.

In last part of his presentation, he discussed the topic of IP audit and expressed that overall purpose of an IP audit is to identify and assess all of the company's intangible assets in order to conduct a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis to determine the valuable core assets and optimise their usage through a systematic long-term strategy."

According to James, IP audit is a systematic review of the IP assets owned, used or acquired by a business. He said the objective of IP audit is to uncover underutilised IP assets, identify threats to a company's bottom-line, and enable business planners to devise informed strategies and maintain and improve the company's market position. The five steps involved in IP audit are Investigation, Identification, Categorisation, Itemise external or market influences and examine enforceability. He said an IP audit report should include inventory issues, rights issues, ownership issues, infringement issues, strategic issues and deficiency issues.

He further explained that an IP Audit should be carried out as a part of an on-going IP asset management programme, when a business is being bought and sold and when a person is enforcing or defending his IP rights. In the end he focussed on the need of IP Valuation, Audit and an Asset Management strategy to optimise income and profit.

Session 16 Excursion Tour

By CUTS International

These two sessions consisted of an excursion tour to local tourist places in Jaipur. The tour enabled the participants to understand nuances of old and new technology. Thus it was a useful exercise and the efforts of the organisers were well appreciated by the participants.

Session 17: Patent Application

By Chitra Arvind, Principal Associate, Rajeshwari & Associates

Chitra Arvind in her presentation covered patenting inventions and the challenges faced by the scientists. She explained the concept and protection of IPRs and its commercialisation. She stated the general problems faced by scientists/technologists/academicians such as lack of time for patenting because of time required to obtain patent, funding problem for their organisation and so on. She further explained the importance and the advantages of the patenting to the participants and the loss incurred by not protecting the invention by citing various examples.

She explained that obtaining patent is important as it provides recognition to the ownership of an inventor over the innovative idea. A number of new inventions have wonderful prospects of making profit for the inventor, unless they are used in an unauthorised manner that can prevent the inventor from making fair profits for his time and labour given on his invention. In fact, a patent ensures protection to the commercial rights of the inventor as well as to the core idea for a certain span as decided by the government.

She also discussed about the myths of IP. She explained to participants that if one need his/her invention to be protected in different countries, one needs to register patent in each of the country as patents are territorial rights and so it is essential to file it separately in each country where it is desired.

She deliberated on the general and specific challenges faced in terms of publication and patenting of invention. She mentioned that it is important to understand that it is a myth that publication is sufficient and there is no need to obtain patent. She expressed that many universities require their students to obtain patents in place of publishing their innovation. In this context she explained three simple steps for an inventor – invention, application for obtaining patent and then publication. Accordingly, she said patenting of an invention is an effective way as it covers a broad area of invention under its ambit and protects the invention from being misused in an unauthorised manner.

She comprehensively explained the advantages of patenting an invention as it not only protects the invention but also provides awards for invention in terms of royalty, lump sum, or on licensing basis and is useful in keeping the competitors at bay. Patents also consolidate market position for the invention and many other practical examples of the advantages were discussed in the session.

The session further elaborated on the patentability criteria and the subject matter that can be patented. She explained that a mere arrangement or rearrangement of known devices functioning independently in a known way or method of agriculture/horticulture, mathematical/business methods, method of playing games, essentially biological process etc. cannot be patented. It was comprehensively discussed the concept of patent portfolio creation and the steps required thereof.

Once the concept of patent was explained and made clear to the participants, Chitra Arvind went on to discuss the key points that should be considered while filing a patent. Some of them are mentioned below:

- Always maintain a lab notebook.
- Be aware of the prior art or the invention which already exist which relates to your invention.
- Differentiate your invention from the prior art and mentioning novelty, inventive step, and industrial applicability over known art.
- Give a complete scope of your invention.
- After filing of all possible research outcomes, publish it.

She explained after getting the patent, following should be considered while licensing or quoting a fee for an invention:

- Time spent for invention
- Labour involved to invent
- Instruments used for invention
- Add 100 percent for intellectual property

After considering the above points one should quote a fee for his/her invention. She also explained that not only patents can protect the invention from unauthorised usage but other IPs such as copyright, trade marks, trade secrets, industrial design registration; geographical indication can also provide the best claims for their innovations.

Interestingly towards the end of this session, she divided the participants into two groups and provided them with two products as models. One group was provided with a bottle of sanitiser and other with a Lip balm. The participants were then requested to identify the characteristics of each of the props and also required to ascertain all types of IPRs that could be applied to protect the product in hand.

Session 18: Simulation Exercise on Patent Drafting

Chitra Arvind, Principal Associate, Rajeshwari & Associates

This session conducted by Chitra Arvind was interactive in nature and focused on developing an understanding of drafting a patent application. She emphasised on the contents of a patent drafting and matter to be disclosed and excluded from the application while applying for a patent. She explained the concept of patent and expressed that it is a right to exclude others from misusing an invention.

In her presentation, she not only explained the definition of patents but also discussed the ingredients required for grant of patent viz novelty, inventive step and industrial applicability as required under Indian Patents Act, 2005. Arvind explained in detail on ways to spot the invention and to identify features that distinguish invention over prior art, and the invention itself. This was done by citing various examples. She said that patent claims need to be broader so as to exclude all the others and protect the invention in widest sense. Furthermore, the session also discussed if a particular invention is patentable and the broad guidelines specifying the list of 'not patentable' invention.

Thereafter, the focus of interactive presentation was directed towards drafting process of a patent application, and discussed in detail various parts of an application like title, field of invention, background, prior art, objects of invention, detailed description of invention, drawings and claims. This entire process of drafting the patent application was explained through various examples and participants were engaged in the related simulation exercises. She also explained that to prevent competition for one's invention, it is better not to give the title which can be easily understood. If any one wants to know what exactly one has invented, he will need to go through your entire patent drafting to understand about your invention.

Arvind explained various part of a patent application by way of examples and explained various aspects while drafting a patent application such as whether it satisfies written description requirement; discloses the invention enough so as to make the claim successful. She mentioned that patents reward disclosure, rather than secrecy and elaborated on steps required to file a patent application include: identifying invention; assessing patentability; drafting application; and patent filing and prosecution – grant.

She underlined the importance of drafting a patent application and skill so required as it passes through different sets of people from different field like - the application is generally assessed by the patent examiner/controller, licensee looks into it to buy it, competitor goes through it to have a idea of an invention, in case of infringement it is examined by lawyers and judge and of course it will be read by general public to know about new invention. Hence, the patent must be drafted in a manner that it addresses and satisfies all the constituencies, if need arises.

An inventor should always keep in mind while filing a patent, he/she should mention the prior art of the invention, how his invention is better than the prior art and how it is solving the problem which exists in the prior art, its industrial applicability, independent and dependent claims.

In addition to the delivering the mentioned documented information on patent application, the presentation also provided certain tips for filing patents. Also, with a view to ensure that the participants learn actual drafting of the patent application, various practical examples such as a hair-drier with iron, tea pot was discussed and so on were discussed at length in the session, which

clarified the whole process further to the participants. The queries of the participants reflected that the exercise was well-received and the members of the training workshop gained from it.

Session 19: Presentations from Simulation Exercise

Chitra Arvind, Principal Associate, Rajeshwari & Associates

In this session, the participants were divided into two groups with a spokesperson representing their group for the presentation of their simulation exercise. Thereafter, Chitra Arvind explained the participants about the simulation exercise and its expected outcome. Participants were given two different products for drafting a patent for those two different items. Group I was provided with the travelling tooth-brush and group II was given a normal tooth-brush.

The two groups discussed within the group about the invention provided to them and had to draft claims for the product. Once the two groups drafted their main and other claims, their spokesperson presented and shared it with all. Chitra Arvind then discussed the actual patent application for tooth-brush drafted by various well known companies such as Colgate etc. and compared the claims prepared by the participants. She also pointed out some major positive points of the claims and some lacuna, where the participants need to be careful. This helped participants to improvise on the drafting skill. In conclusion, participants gained a good practical experience from this exercise and were acquainted with number of specifications to be considered while drafting a patent application.

Session 20: Closing and Evaluation

Archana Jatkar, Coordinator & Deputy Head, CUTS Centre for International Trade, Economics & Environment

In the closing session, the importance of technology diplomacy and the necessity to organise such training programmes was reiterated especially in the context of India. During the five days programme it was felt that in spite of technological developments in this field, there is still a room for a lot of activities to be carried out especially in India and this field offers great opportunities for promoting our growth and development.

Further, the participants were requested to provide the feedback on the training programme. They opined that the training programme provided them with a 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 programme. The participants also thanked the Department of Science & Technology and CUTS for organising such a knowledgeable training programme for better understanding of the subject and implication on their work. Most of the participants expressed their interest to attend similar training programmes of longer duration in the future.

In her concluding remarks, Archana Jatkar thanked all the participants and resource persons for their valued participation and contribution in making the programme successful. She also thanked the Department of Science & Technology for assigning this programme to CUTS. She also thanked to her colleagues for their immense support to make this programme successful.