



TECHNOLOGY INCUBATION CENTRE

Technology Incubation Centre (TIC) provides an environment that attracts and nurtures technology based start-up companies transforming them into commercially viable enterprises. TIC, the first model technology incubator in Pakistan was established under NUST to encourage, facilitate and support the engine of innovation of our university environment.

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Message of Director General



Air Cdre (R) Mansoor Malik
Director General
Technology Incubation Centre

Technology Incubation is an idea that has thrived in the developed countries for decades and is credited as the major factor behind the level of technological development these countries have reached today. The start of the last century saw the revolution of socio-economic progress from Agricultural Economy (based on Land, Natural Resources and hardworking Labour) to Industrial Economy (based on Machinery, Capital and efficient Management). Already we are passing through another revolution and it won't be an exaggeration if we call the time we are living in, the era of Knowledge-based Economy (or the K-Economy) built on the elements of Science-Technology, Innovation and Entrepreneurship.

Technology Incubation Centre (TIC) at National University of Sciences and Technology (NUST), the first model technology business incubator in Pakistan formed with the objective of establishing links between commercial world and the university. TIC assists engineers/technologists in learning the much needed entrepreneurial skills to get the much deserved reward for their efforts and guides them in the basic techniques of setting up a successful business through encouraging a culture of commercially viable R&D. This can only be accomplished if scientists, researchers and engineers are very well familiar with the challenges of today's cut-throat competitive global business environment.

We, at TIC provide a platform to promote knowledge-based enterprise development and boost economic growth by fostering cluster development and establishing linkages between academia and industry. Technology Incubation exemplifies the triple helix model of university- industry-government relations.

We have moved into our second premises with increasing number of new technology based start up companies. TIC facilitates to breed and nurture startup companies thus contributing towards the economic growth as these new enterprises create jobs which stimulate economic growth. NUST-TIC takes pride in growing global by out-reaching the venture capital firms in the Silicon Valley, USA in May, 2007. One of the Pakistan-American leading venture capital company has shown interest in three of our start-up companies to the tune of investing more than US \$ 50 million.

Our next challenge would be when we move into our custom built campus in H-12 sector where we have provisioning of incubating nearly 80 high tech start-up companies and establishing the first Technology Park in Pakistan.



Introduction

The concept of business incubation has been successfully applied around the world. It can offer better returns on investment for successful business creation, job and revenue growth with measurable direct and indirect economic impact.

Technology Incubation Centre (TIC) is an initiative of National University of Sciences and Technology (NUST), established to facilitate & support the innovation engine of university environment. TIC has restructured its different roles. Now, TIC is focusing on facilitating technology based start-up companies and transforming them into commercially viable enterprises. NUST Consulting has undertaken five Collaborative Projects of TIC in its fold and Professional Development Centre, a recently approved project of NUST has been established to conduct various training courses and workshops of all NUST colleges/centres/institutes. Air Cdre (R) Mansoor Malik is heading all the three organizations. The new mission statement of TIC is "We provide an environment that attracts and nurtures technology based start-up companies

transforming them into commercially viable enterprises". TIC has the following new goals and objectives after restructuring between these three NUST institutes:

1. To help potential entrepreneurs such as students, NUST faculty and general public to incubate their technology based companies.
2. To provide support to NUST colleges/institutes/centres for patenting their research and development work.
3. To liaison with private/public sector enterprises and funding sources, govt. agencies, industrial associations, chambers and FPCCI to provide facilitation and networking for incubatee companies.

TIC has the aim of creating successful companies through relationship it has created with its network of experienced entrepreneurs, professional service providers, economic development partners, small business service providers, university experts as well as a dedicated staff. TIC provides the incubation services through Admin/Physical Support, Investment Management and Enterprise Development.

Seminar at Sialkot Chamber of Commerce & Industry

Dr. Amir Azam Khan, Head of Material Sciences Department, Centre for Chemical Engineering and Material Sciences (CCE&MS), NUST, delivered a lecture on "Plasma Surface Coatings in Engineering Applications" at Sialkot Chamber of Commerce & Industry (SCCI) on the 6th of February 2007. The Seminar was arranged by Technology Incubation Centre (TIC) in coordination with SCCI and was attended by about 25 Chief Executives and Representatives from various leading industries including Sublime Sports, Saga Sports and Quench Age.

NUST-Technology Incubation Centre decided to organize this seminar in order to bridge the gap between industry and academia. It was an effort to gain some knowledge of the problems facing the Sialkot Industry and then solving these problems through consultancy. Mr. Mansoor Ali, Business Development Manager TIC also accompanied Dr. Khan in order to liaise with the reps from various Industries at Sialkot.

Dr. Khan has an extensive research and consultancy experience in the field of Plasma

Spraying. He worked for General Electric Medical Systems, USA, during his PhD where he produced and characterized Tungsten and Molybdenum coatings for their high energy X-Ray targets. He also provided consultancy to leading organizations in Pakistan such as ICI, Allan Dick, Treet Corporation and AWC. During the seminar Dr. Khan gave a detailed account of modern coating processes and their relative importance vis à vis present and future industrial needs of the industry.

He also provided relevant data about the technical problems, installation and running of a plasma spraying facility which can be adapted according to the local needs. The seminar generated a lot of interest for the attendees, mainly from the sports and surgical industries. There appeared to be a scope for a University-Industry linkage programme through NUST-TIC and SCCI collaboration.

NUST-TIC looks forward to organize more seminars/lectures at various leading Chambers for creating awareness of NUST capabilities and capacities in order to make best possible use of the available knowledge base for present and future challenges to the nation.





National Science & Technology Expo, 2007

Science and Technology Expo, 2007 was inaugurated on 24th March, 2007 at National Memorial Museum. The exhibition was entitled under "Shaping the Future". It was organized by Pakistan Science Foundation (PSF) to highlight the achievements of the public sector research organizations. The exhibition was arranged with the aim of creating awareness and to popularize science and technology in the country. The expo was open for public from 25th March, 2007 to 23rd April, 2007.

Twenty public sector science and technology organizations including NUST participated in the exhibition. Among these were NESCOM, Khan Research Laboratories (KRL), Pakistan Atomic Energy Commission (PAEC), Pakistan Science Foundation (PSF), Pakistan Council for Scientific Industrial Research (PCSIR), Pakistan Council for Research (PCR), Council for Works & Housing (CWH), Pakistan Council of Renewable Energy Technologies (PCRET), COMSATS, Pakistan National Accreditation Council (PNAC), Centre for Applied Molecular Biology (CAMB), National Institute of Oceanography (NIO), Pakistan Standards & Quality Control Authority (PSQCA), National



Institute of Electronics (NIE), Space and Upper Atmosphere Research Commission (SUPARCO), Pakistan Agricultural Research Council (PARC) and National Physical and Standard Laboratories (NPSL). All the participating organizations displayed their products and achievements with the aim of providing an opportunity to general public, particularly younger generation to observe the major research being done in different fields of science and technology.

Technology Incubation Centre was the organizer for the operations of NUST stall at the Expo. Pictorial details of NUST Institutes were displayed on the stall through a story board. Brochures of NUST Colleges / Institutes / Centres were also available for distribution at the stall. TIC displayed different products in the exhibition including the software of "Offline Solution for Remote Monitoring and Data Acquisition Solution" of NUST Institute of Information Technology (NIIT), software of

"Multi Currency Accounting System" of Electrosoft (an incubatee company), Munawar Air-conditioning Tile (MAT) of Munawar Solar Network (an incubatee company), Solar LED lights, CNG Car Kit and Solar Dryer.

The exhibition provided a platform for researchers, planners and policy makers for close interaction and collaboration with other institutes. People from different walks of life especially students showed keen interest in the stalls of participating organizations and were of the view that without technological development no country can compete with the



developed nations of the world. The closing ceremony of the exhibition was held on 23rd April, 2007 at Holiday Inn, Islamabad. Dr. Ishfaq Ahmad, N.I, H.I, S.I, Special Advisor to the Prime Minister was the Chief Guest. He presented the "Shield of Participation" to the participating organizations for their excellent participation and dedication for the exhibition.

New Incubatee Companies Join TIC



TIC is an effort to employ the idea of Technology Incubation for the prosperous future of both technology-related researchers and industries. TIC has moved into the second premises with an increasing number of new technology based start up companies, which are spread over in 3 broad sectors of Engineering, Information and Communication Technologies (ICT) and Services. We are pleased to announce that two new incubatee companies have joined TIC recently. Their brief profiles are as follows:

1. Software Bridge

Software Bridge facilitates in overcoming the challenges in managing and operating IT business, especially in the domain of software engineering and quality control. By the virtue of long term association with the IT industry, Software Bridge combines its expertise and experience with innovative thinking to assist the customers to define a long term strategy in terms of software design processes and utilize tools to provide best possible solutions. Its current focus is in the field of Data Cleansing, which is an integral part of Data Warehousing. Software Bridge is also planning to develop their new product line in the field of Data Warehousing. The approach of Software Bridge is to develop a deep understanding of client's business in terms of needs, challenges, parameters, available or desired technology and ultimately corporate goals before providing solutions. Furthermore, the dedication towards research and development

enables to anticipate the needs, improve quality and reduce costs and maximum return on investment to the valued clients.

2. Dual Matrix Corporation (DMC)

Success in automation demands insights into customer needs, experience with industry best practices, and inspired execution. The DMC team has won plaudits from international corporate leaders for enabling organizational excellence through automation. DMC is a young company but its Team has a tremendous record of providing information technology services and developing world class software for Fortune 500 and Global 2000 organization that achieved business targets and created customer delight.

The DMC Service Model excels at identifying, articulating and addressing customer needs. It leverages years of experience with leading organizations in the application of industry best practices and avoids common pitfalls. Key dimensions are OVTM (One Virtual Team Model), the focus on Business Benefit, and the use of Rigorous Processes. DMC offers Services designed to individually add value and in combination to achieve bottom line business impact. DMC offers the following services:

a. Enterprise Content Management Consulting

If unstructured information like letters, invoices, forms, policies and documents is accumulating faster in your company than your ability to handle it then you are a candidate for Enterprise Content Management (ECM). ECM enables you to store, access and process unstructured information, automate business

processes and integrate silos of applications. DMC provides the services to study your requirements, identify key processes and data, recommend a strategy including policy, practices and resources, help select a vendor & technology, define the architecture and monitor implementation.

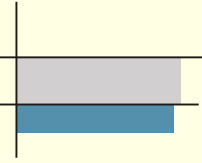
b. Organization Effectiveness Profiling (OEP)

Even if you are GE or Microsoft or otherwise awash in cash, your company may have areas of relative weakness that can drag you down in the next business down cycle. OEP is an online revolutionary way to quickly and lucidly gauge the health of your organization's most important facets strategy, culture and systems using feedback from your most important resource people. OEP identifies areas of excellence, strength and of concern so that remedial work can be initiated. The entire process takes a few days.

c. Web 2.0 Advertising

There are four million educated and relatively high income Internet users in the country increasing at more than a million a year. With Web 2.0 advertising you will be able to place your ads in front of people most interested in them and likely to become customers. You will pay only when interested leads actually click on your advertisement. We provide the services to understand your company and its offerings, understand your target audience, know your budget limitations, design your online advertisement strategy, identify your key word identifiers, design your online ads and provide feedback.

New Role of NUST Consulting



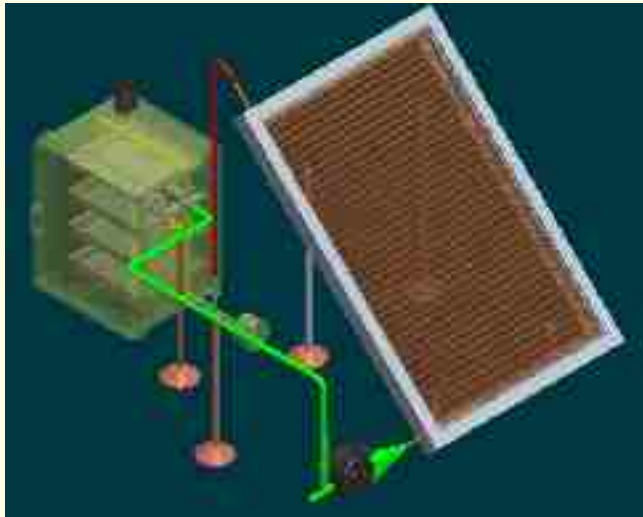
NUST Consulting (NC) is a semi-autonomous subsidiary set up by NUST on 1st July, 2002. NC was given another dimension as TIC's anchor incubatee company in December 2004 and recently, it has been placed under Director General TIC with the vision: "To emerge as a centre of excellence for technological and managerial solutions to Industry and Community". The mission of NC is: "To foster University-Industry linkages through commercialization of applied research projects and extending consultancy services for sustained socio-economic development". The focused areas of NC are Renewable/Alternate Energy Technologies Development and Implementation, Automotive Technology Development, Healthcare Programs and Applications, Environmental Engineering Applications and Civil / Mechanical / Electrical Engineering Consultancy. The details are as follows:

1. Renewable Energy Technologies

NC is involved in the projects related to renewable/alternate energy. Work has been carried out in solar water pumping, solar home electrification in villages, solar space heating, industrial and residential water heating and gasifier development to name a few. The details are given below:

i. Solar Dryer

Hybrid Solar Dryer is very effective, inexpensive, and quick method of drying fruits and vegetables. Hybrid solar drying systems



utilize Electrical Energy to supplement solar dryers and thereby eliminating or reducing the weather dependence of solar only drying systems.

ii. Solar Water Heating for Industrial Application:

Among all renewable energy sources, solar radiation available in great abundance is the most promising future source of energy. On approaching earth, its peak value at sea level is 1kWh/m^2 amounting to 102×10^{12} GW per year. This value is more than 10,000 times the current total of all types of energy that the world is using today. Considering different constraints such as location and availability of land to install solar collectors, the net potentially useable energy is at least 125 times the current world energy consumption.

Solar water heating system must be used where available fraction of solar energy matches with the load. There is a match between solar energy fraction and the load in commercial and industrial applications. The main focus of this project is to address the industrial sector where there is huge consumption of furnace oil or gas. In this regard, solar water heating system will

be installed using evacuated solar collectors at Siddique Leather Factory, Lahore. The funding for this pilot project is provided by HEC. The monitoring system will also be installed including meters and temperature sensors to analyze the performance of the system and to create a model project so that this technology can be wide spread on large scale in industrial sector.

Completed Projects:

- a. Solar Water Heater for Cadet College Hostel, Sihala.



- b. Solar water pumping in a village in Kurram Agency, FATA; duly funded by International Fund for Agriculture Development (IFAD).
- c. Solar/Gas hybrid home water heater for commercialization.
- d. Solar home electrification and water pumping in a village in Balochistan; funded by USAID-SARI Program.
- e. Solar water pumping in 6 FATA villages; funded by HEC/MoST/USAID.
- f. Energy efficient homes.

- g. Development of training book on "Solar PV and Water Pumping Systems"; funded by GTZ and UNESCO.



- h. Solar hybrid water heating system for industrial application; funded by HEC.

2. Automotive Technology Development

i. Indigenous Development of CNG Car Kit

In recent years the Compressed Natural Gas (CNG) has emerged as alternate fuels for vehicles in many countries including Pakistan. The CNG is an indigenous, smoke-free, and clean fuel. In past, there have been some efforts by the public and private sector in Pakistan to develop CNG conversion kit for vehicles, but could not bear fruit for certain reasons. The focus is to utilize the design engineering, material sciences, and precision manufacturing techniques to develop the product for commercial use.

ii. Light Weight Three Wheeler 4-Stroke Slim Car/Rickshaw Utilizing Composite Material

The purpose is to design and develop a 4 stroke rickshaw using composite material. Due to the

2-stroke engine, the rickshaw in the current market has inferior emission and fuel efficiency. In this project, a product would be developed by using 4-stroke engine, which would improve its fuel efficiency and contribute to emission reductions.

3. Electrical/Electronics Engineering Applications

i. Super Energy Light Bulb

When compared to incandescent and fluorescent lights bulbs, LED (Light Emitting Diode) lights produce negligible heat, operate



for a much longer life, less prone to failure in high vibration environment, operate safely under wet conditions, low maintenance, consume far less power/electricity, and save



more money in the long run. NUST College of Electrical and Mechanical Engineering is involved in this project. In this regard Solar Panel and Paddle Generator based LED Lighting Systems have been developed which can be very effectively utilized in remote rural areas, where electricity is not available. It can also be used as stand-by arrangement in case of load shedding. Currently this application is going through its commercialization phase.

ii. LED for General Lighting Purpose

Power LEDs are being used to develop LED lights for general lighting purposes. These LED light clusters can be used to illuminate various places like streets, gardens, lobbies etc. Another industry specific light requirement would also be fulfilled using these LED configurations. The efficacy of the LEDs is not sacrificed with the use of power LEDs as the power consumption of the LED configurations would still be in the range of 30-40 Watts whereas it would produce a light comparable to a 300 Watt halogen lamp.

4. Healthcare Programs & Research Projects

NUST Consulting with its Healthcare Department has not only imparted short-term post-graduate training to over 600 health professionals in the innovative areas of hospital management, occupational health, health systems management, pharmaceutical marketing, nursing management, healthcare waste management, etc., but has also undertaken significant public health projects in the areas prioritized by the government. These included:

i. Post-intervention KABP study on HIV-AIDS among Industrial Sector & LDTD in Pakistan

funded by ILO

- ii. Hospital Waste Management Project funded by Ministry of Environment
- iii. Mid-term Evaluation of PM program related to interventions in Primary Health Care in Pakistan funded by UNDP
- iv. Implementing HCWM Guidelines in HCE funded by EMRO, WHO
- v. Projects in development stage are: (Concept paper forwarded to HQ NUST for necessary approval)
 - a. R & D in Pharmaceutical Sector & Integrative Medicine
 - b. Hospital Waste Management Project: An integrated model
 - c. Attachment of recognized panel of Radiologists / Sonologists with NC mediated Ultrasound Evaluation Board
 - d. Safe & Health Plus Foods
 - e. Comprehensive School Health Initiative
 - f. Hospital Consultancy & future health sector development projects of HQ NUST focusing on paramedics, medical technologists, pharmacists, epidemiologists, etc
 - g. Health Systems Research Centre (HSRC) under NUST addressing all above areas as an integrated unit

Demonstration of "LED Rural Application" at Nandher

TIC team with the collaboration of Pakistan Poverty Alleviation Fund (PPAF) and Sarhad Rural Support Program (SRSP) visited Nandher village (Mansehra) to display the LED Rural Lights application in the earthquake-affected area on 4th April, 2007. The application specifically designed to provide a lighting solution in areas where there is no electricity was installed and displayed to the local community who are without electricity and use other sources of energy to illuminate their homes. The locals (Nandher and other surrounding villages without electricity) currently use coal, gas, oil and wood as resources to produce light. All these inputs have their drawbacks, as coal and wood produce smoke which is hazardous for lungs while oil and gas are not readily available in the area and villagers have to travel a long way to go and procure them. The cost of these items to the villagers also runs high.

The LED Rural Lighting application is designed & developed by College of Electrical and Mechanical Engineering (EME), NUST to provide light with the help of Solar Panel and Paddle Generator. The first solution consists of LED based lamps, solar panel, battery, charge controller and down converter. The process works, when the battery gets charged during the day through the solar panel. Once the battery gets charged, the LED lamps can be used during the night time operated through the charged battery. The second displayed module was LED lamps operated with the help of a paddle generator. The module consists of a paddle generator (cycle), battery, charge controller and LED lamps. This solution can



work anytime and is not dependant on the solar light. The paddle generator charges the battery when the cycle is operated and the lamps get illuminated through the battery.

The local villagers appreciated the lighting solutions and expressed their interest in both the modules. The TIC team comprised of Project Engineer Mr. Amer Malik, Research Associate Mr. Adnan and Technician Mr. Allah Yar, was well assisted by PPAF-Mansehra and SRSP that arranged the demonstration. The demo was attended by local people, some of which had traveled from surrounding areas.

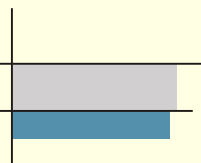
Promotional Activities

The concept of business incubation has been successfully applied throughout the world. It can offer better returns on investment for successful business creation, job and revenue growth with measurable direct and indirect economic impact. Starting a new business is not an easy task as it usually requires a large number of resources and versatile capabilities. A person or a group may have a brilliant idea to

enter the market but may not necessarily possess the needed skills to develop a business plan or prepare a marketing strategy and it just might be too costly to procure all the resources needed to run the business. TIC helps individuals/groups to establish their company and can nurture their company into a fruitful, profitable business enterprise. When the company is mature enough to stand on its feet and work on its own, TIC can facilitate their move from its premises into the industrial parks or a relevant market sector.

Currently TIC is using print media and other resources for the awareness of Technology Incubation and to impart entrepreneurial knowledge to NUST faculty/students as well as general public. TIC has given brief presentations to NUST faculty/students, HEC recognized universities and other esteemed organizations. Currently TIC is planning to expand its promotional activities through electronic media. In this context TIC is working on the preparation of a NUST documentary. The documentary will be of international standard, having coverage of all NUST colleges, institutes and centres.

Professional Development Centre



NUST has a newly established Professional Development Centre (PDC) to cater to the challenge posed by the ever increasing pace of technological development in a professional's career. The centre would provide to the working professionals an avenue to improve on their knowledge, skills and creativity. The centre would mainly concern in improving quality of human resource in the country, especially those involved in engineering, medical, IT, management and sciences. PDC, in close collaboration with NUST colleges / institutes /

centres, will offer the following type of courses:

- i. Short courses for professional engineers, doctors, managers and IT professionals ranging from a day to a week; Certificate courses ranging from few weeks to about three months; Postgraduate diplomas in specific technological areas.
- ii. Conversion courses for engineers, doctors, managers and IT professionals who require fulfilling the conditions of PEC/PMDC.
- iii. Structured courses for engineers, doctors, managers and IT professionals who wish to acquire degrees (in consonant with the academic requirement of the university and accreditations requirements).

TIC/NC offers the following Professional Development Courses that will now shift to PDC:

i. **Six Sigma Course**

Six Sigma is a fast growing management approach for the improvement of products and processes of any business. The course of Six Sigma which is a green belt certification is especially beneficial for those, who are responsible for spadework and implementation of cutting edge technology to enhance customer satisfaction and operating efficiency of their business processes.

The sixth course on "Six Sigma: Concept, Tools and Implementation" was offered by TIC on March 20-22, 2007. It was attended by professionals of leading organizations like National Database and Registration Authority (NADRA), Khan Research Laboratories (KRL), Carrier Telephone Industries (Private) Limited, KSB Pumps Co. Ltd., Nokia Networks, Pakistan Mobile Communication (Pvt.) Ltd., Pakistan Software Export Board etc. Mr. Zulfiqar Ali and

Mr. Muhammad Raza Ahmad Khan General Manager TIC conducted the course. Both of them have management and consulting experience in implementing leading edge techniques for quality & productivity improvement. (PDC may be contacted for further details about the next course)

ii. Peachtree Computerized Accounting Course

Compliance Management System (CMS), an incubatee company of TIC offers computerized accounting course. The course is designed keeping in view the requirements for the people who are working or want to work in the accounting and finance departments of various organizations.

The program covers the modules of general ledger, accounts receivable, accounts payable, inventory, payroll solutions and financial



statements. The Participants included students, accounting & finance professionals and entrepreneurs, were from NUST colleges/institutes/centres, Allama Iqbal Open University, Federal Urdu University, MNP Database (Guarantee) Limited, ESOLPK Pvt Ltd, Interactive Conversions, NGOs and other leading organizations.

CMS has offered six successful computerized accounting training programmes. CMS offered its sixth course in its state of the art lab. It is newly established at TIC-Park II for practical training of the participants. PDC and CMS will offer this course on regular basis.

iii. Lean Production Management:

Lean Production Management is a two days training programme, conducted by Mr. Raza Ahmad Khan, General Manager TIC who has the experience of implementing cutting edge tools in different U.S and Pakistani companies. The course contents are designed to increase the competitiveness of organizations and to prepare them for challenges of globalization. The implementations of lean production management results into slash inefficiencies cut costs and enhance productivity. (PDC may be contacted for information about the course)

iv. Professional Courses in Health Disciplines:

The details of services in health disciplines are as follows:

- Hospital Management (Nine courses offered in Rawalpindi - Islamabad, Peshawar & Lahore)
- Nursing Management / Commission in Graduate Foreign Nursing School (CGFNS)
- Pharmaceutical Sales & Marketing Management
- Health Systems Management
- Healthcare Management Information System (HMIS)
- Occupational Health, Safety & Environment

Several collaborative clinical programs have been offered in Diagnostic Ultrasound and seven batches of Professional Diploma in



Diagnostic Ultrasound (PDDU) have been completed till now by NC. Award ceremony in honour of successful participants of Professional Diploma course on "Occupational Health, Safety & Environment" (OHSE-Batch II/Rawalpindi) was held at HQ NUST on 10th May, 2007.

Fifteen successful participants of second batch of "Occupational Health, Safety & Environment" were awarded professional diplomas in a simple, but graceful ceremony conducted at HQ NUST on 10th May, 2007. Air Cdre Muhammad Ismail, Director Quality Assurance (NUST) graced the occasion as a Chief Guest.

Engineering Services at TIC

CAD/CAM cell at TIC facilitates the local industry for their product design management (PDM) solutions, skill development, and Product life management (PLM) solutions. This cell provides industrial, manufacturing and reverse engineering solutions. TIC has the relevant human resources in the form of in-house CAD/CAM/CAE expertise and access to R&D resource persons at NUST colleges/institutes/centers.

TIC has offered six successful CAD/CAM/CAE training courses in collaboration with Synthetic

Products Enterprises (Pvt.) Ltd. (SPEL) and DELCAM. Recently TIC conducted internationally certified ANSYS training program in collaboration with SimCon International Pvt Ltd. SimCon is an authorized representative and trainer of ANSYS Inc.

The Course was designed according to the requirements of graduate/diploma engineers, product designers and technicians involved in finite element analysis of mechanical components/products. ANSYS training program using CAE Applications consists of six modules. The training program was divided



into two courses. First course was held from June 4-9, 2007 and second from July 9-14, 2007. The modules of the training program covers the following:

- Introduction to ANSYS Intro I
- Introduction to ANSYS Intro II
- Advanced Contacts and Fasteners
- Basic Structural Nonlinearities
- Advanced Structural Nonlinearities
- Dynamics

The frequency of conducting the ANSYS training program at TIC is twice a year. (TIC may be contacted for further information about the course)

TiEcon 2007: The New Face of Entrepreneurship

TiE is a global, not-for-profit network of entrepreneurs and professionals, dedicated to nurture entrepreneurship globally. Since its founding in 1992, TiE has grown to become the world's largest organization for entrepreneurs and professionals, with membership spread across 45 chapters, in 10 countries. There are over 1500 experienced entrepreneurs and business executives as Charter Members, over 10,000 aspiring entrepreneurs and professionals as Members. Top Venture Capital firms, fortune 500 corporations, and professional service providers are among TiE sponsors.

TiEcon 2007 was scheduled on May 18 -19, 2007 at Santa Clara Convention Centre, Santa Clara, CA. TiE attendees included more than 4,000 people from across the world. Participants from Pakistan, Bangladesh, China, India, Indonesia, Islamic Republic of Iran, Malaysia, Philippines, Singapore and Thailand attended TiEcon 2007. Attendees span the spectrum from CEOs of mature companies to first time entrepreneurs creating new companies, financial market experts, government policy makers and eminent personalities from academics and media.

TIC participated in the TiE events held at its Karachi and Lahore chapters from 2006 onwards. Now TIC is yearning to start a TiE chapter in Islamabad. For that Air Cdre (R) Mansoor Malik, Director General Technology Incubation Centre-NUST attended TiEcon 2007 and personally submitted TIC-NUST's case for opening a TiE chapter in Islamabad which was very well received by TiE Global senior members. TIC has planned to launch the

Islamabad TiE Chapter by the end of 2007.

TiEcon 2007 brought together a complete ecosystem for accelerating the full cycle of a company's development, from funding to launch to growth to success. TiE's main goal was to generate and nurture the entrepreneurs of the next generation. TiE provided the opportunities to listen to some of the best keynote speakers in the world, network with industry experts, peers, and serial entrepreneurs, discover the latest trends and hottest business opportunities, hear the experiences of emerging start-ups, schedule meetings with leading VCs, Lawyers, Bankers and meet future business partners.

TiEcon 2007 carried forward two events of Distinguished Speaker Series and Entrepreneurship Bazaar. The Entrepreneurs Bazaar at TiEcon was a one-of-a-kind "must participate" event for savvy entrepreneurs scheduled on 18th May, 2007. The event format was designed to provide attendees with feedback and critique to evaluate their ideas and to take them to the next level. From NUST, Director General TIC availed a valuable opportunity to have high quality one-on-one interactions with venture capital firms and had several face-to-face meetings with other top-notch firms. A Pakistani-American leading venture capital company showed his interest in three start-up companies of TIC-NUST.

TiEcon had two action-packed days of learning, networking, and partnering. TiEcon explored today's business environment and discussed the big issues facing industry and entrepreneurs. Keynotes, panel discussions, and case studies focused on various business ecosystems including networking, semiconductors, software, storage, security, Internet, hospitality, wireless, life sciences and other emerging businesses.



NUST TIC and Stanford University Networking

NUST-TIC had several fortunate meetings with the senior staff members of Stanford University in the month of May, 2007 during the TiEcon 2007 Conference in Silicon Valley. NUST-TIC is looking for International Entrepreneurship Collaboration with Stanford University. Two scheduled meetings were held with School of Engineering i.e. US-Asia Technology Management Centre and US-Japan Business Innovation Centre, San Jose and two meetings with the Graduate Business School i.e. CES (Centre for Economic Studies) group and Ms. Barbra L. Harley, Founder and Executive Director (retired) of International Business Incubator of Stanford University and presently, Chairperson Harley Consulting Group. In these

valuable meetings the topics of Technology Incubation Management and Technology Park Management were discussed and presentation on TIC model was given by the Director General TIC-NUST. The following five areas of interest were also discussed during meetings:

- a. Entrepreneurship Development
- b. Transfer of Technology Office
- c. Intellectual Property Rights Office
- d. Technology Incubation
- e. Technology Park

NUST-TIC has the aim to bring Entrepreneurship and Technology Incubation/Park Management Collaboration at international global level for establishing best practices and bench marking for Pakistan in this new and exciting field.

Intellectual Property Rights Office

I PRO at TIC provides legal advice, consulting services and access to patent/equity related resources to researcher and scholars. The main objective of I PRO is to provide services related to evaluation of products / innovations, providing legal services to researchers & innovators and to create a knowledge base to share information at the national level to facilitate jump start technological innovations. During the last six months researchers have filed 5 patent applications, making it a total of 20 patent applications filed through TIC-I PRO to date.

Recently, a consultative meeting “WIPO Advisory mission on GI (Geographical Indications) Legislation” was held on 7th June, 2007. Geographical Indication is a sign used on goods that have a specific geographical origin and possess qualities or a reputation that are associated with their place of origin. Meeting was held with a group of stakeholders at Intellectual Property Organization (IPO) Headquarters, Islamabad.

Prof. Dr. Atta-ur-Rahman, Chairman Higher Education Commission (HEC) and Mr. Yasin Tahir, Director General Intellectual Property Organization (IPO) Pakistan nominated Air Cdre (R) Mansoor Malik, Director General TIC from NUST to participate in the deliberations. Mrs. Miyuki Sahashi, Consultant Technical Assistance and Capacity Building for Asia & the Pacific and Mrs. Francoise Simon Vianes, Senior Programme Officer Economic Development Bureau for Asia & the Pacific participated in the Advisory Mission on the behalf of World Intellectual Property Organization (WIPO).

Visit of Rector-NUST at TIC

Lt Gen (R) Syed Shujaat Hussain (Rector), Rear Admiral (R) M. Mushtaq (Pro-Rector), Mr. Sheikh Mehmood Ahmed (Project Advisor), Brig (R) Dr. Muhammad Nasrullah Khan (Registrar), Air Cdre Salman Absar (Director R&D) and Brig Muhammad Salim (Dir E&A) visited TIC on 9th June, 2007.



Air Cdre (R) Mansoor Malik, Director General TIC gave a presentation on TIC’s background and restructuring of TIC’s current activities through a new framework of TIC, NUST Consulting (NC) and Professional Development Centre (PDC). He briefed about TIC’s incubatee companies, TiEcon successful visit and the interest of Venture Capital firm in



the three projects of TIC's start-up companies.

Rector NUST suggested that all the key personnel of NUST colleges should visit other NUST colleges to explore the potential of joint collaboration. Pro-Rector was of the view to contact bright resource persons abroad to be placed at NUST and to conduct the Entrepreneurship courses on regular basis. At the end Rector NUST applauded the efforts of TIC.

Entrepreneurship Workshop

TIC conducted four days workshop from June 4-7, 2007 on "Harnessing the power of Entrepreneurship-A workshop for the entrepreneur and the entrepreneurial Manager". The workshop held in collaboration with Dr. Nauman Farooqi who is an Associate Professor in the Department of Commerce at



Mount Allison University, Sackville, Canada. Dr. Farooqi has won several awards including the Paul Pare' Excellence Award 2005 and 2006 by Mount Allison University for excellence in research and teaching. He has also conducted various workshops all over the world. He is an experienced teacher, trainer and senior



manager, specializing in finance & financial management with more than thirteen years of professional experience in Canada, United States, the Middle East and South Asia.

The target audience for the workshop was faculty/post graduate students, who were looking for necessary skills and knowledge to start new high tech ventures. The workshop aimed at providing hands-on experience to the scalable venture creation and enhancement process.

Mr. Zubair Malik, Former Zonal President, The Federation of Pakistan Chambers of Commerce & Industry (FPCCI) graced the occasion as a chief guest. The keynote speaker of the workshop was Mr. Qazi Emad, Managing Director, SPEAR Technologies (TIC's incubatee company). Certificate distribution ceremony of the workshop was addressed by Rear Admiral (R) M. Mushtaq, Pro-Rector NUST. The participants were required to present their business plans and ideas which were evaluated by the panel of judges including Air Cdre (R) Mansoor Malik, Director General TIC, Mr. Khalid Qayum, Senior Vice President, Askari Leasing Ltd. and Mr. Nauman Farooqi, resource person of the workshop. TIC has planned to conduct entrepreneurship workshops with the frequency of twice a year through HEC sponsorship.

Silicon Valley Re-Visited & The Pakistan's Case

Within the first three years of the start of my public career in 1978, I had the opportunity to visit Stanford University, Palo Alto and Menlo Park. After a gap of nearly 30 years, in the month of May, 2007 I re-visited the same area again after attending the TiEcon SV-07* at Santa Clara, California, USA. The whole area had gone through a metamorphosis with the green fields around the Sand Hill Road and Menlo Park converted into the world's largest and most expensive high-tech real estate—commonly now known as the Silicon Valley. With the most vibrant University Campus of Stanford on the one side and the biggest 'Venture Capital firms on the other side of the Sand Hill Road, Stanford has taken us to a new era of our times which is known as the Knowledge and Innovation Economy.

The disruptive technologies created by this knowledge and innovation engine fueled by the free floating dollars from the venture capital have given rise to the new players of the Fortune-500 Companies. Microsoft, SUN, CISCO, e-Bay, ORACLE etc; are some of the companies which have now become a household name but there are hundreds of other such companies, both start-up and maturing companies which are gearing to take-off in directions which are beyond our perceptions to-day.

The most heartening thing in the Silicon Valley to-day is the number of Asian-American CEOs' running these hi-tech companies very professionally and competing at the highest global level. A very large number of employees belong to our South Asian region with a majority of them from India and Pakistan. Most of these employees and their CEOs' are young people in their late 30's and early 40's which is

* TiEcon SV-07 stands for The Indus Entrepreneurs Conference, Silicon Valley- 2007

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Engr. Mansoor Malik holds masters degree in Electronics Engineering from University of Southampton, U.K. with a specialization in Control Engineering Systems. He has more than twenty years experience in public sector R & D institutes and Academia. He was the founding programme manager of Air Weapons Complex (AWC) and Advanced Engineering Research Organization (AERO). He is the founding Director General of Technology Incubation Centre-NUST, the first of its kind in the country.

very encouraging. All we have to do is to create an "Enabling Environment" for these technopreneurs to establish a bridge-head between their Silicon Valley ventures and Pakistan to start reaping the benefits of the Knowledge/Innovation Economy.

NUST Technology Incubation Centre (TIC) has been successful to make in-roads into the Graduate Business School and the School of Engineering of the Stanford University to start our own modest 'Silicon Valley' programme in Islamabad. Some of their experts are likely to collaborate with TIC Management to put up the best practices and bench marking standards for Technology Incubation/Technology Park Management at the new Smart NUST Campus coming up fast at Sector H-12 Islamabad. This

collaboration between the old Silicon Valley management (Stanford University) and the eager TIC management (NUST) would give a big boost towards the growth of our modest Silicon Valley Programme.

Islamabad is ideally placed to start Pakistan's 'Silicon Valley' programme around the new NUST Campus at H-12 Sector. Within a few years time, this campus would have more than 10 post-grad research institutes alongwith their Research Centres in the midst of the sprawling Islamabad city. The Technology Incubation Tower being built in the H-12 Sector could accommodate more than 80 hi-tech start-up companies and alongwith it a reasonable piece of land has been earmarked to establish the first Technology Park in Pakistan in this NUST Campus. All the decision makers and supporters of this endeavor whether in the HEC (Higher Education Commission), MOST (Ministry of Science & Technology-S&TR Div) or the Ministry of IT and Telecom are based in Islamabad. This would create a beacon of hope and a source of attraction for overseas Pakistanis as well as other entrepreneurs from China (MoU signed with IBI Beijing), Europe and America to facilitate their market access in Pakistan.

Some of the early start-up companies of our Technology Incubation Centre are in the process of maturing out and graduating in FY 07-08. For this purpose, the undersigned tapped several venture capital firms on Sand Hill Road and Menlo Park, California USA. To our good fortune, one of the Pakistani-American Venture Capital Firm Chairman picked up three of our company's projects for industrialization through venture capital support to the tune of more than US \$50 million investment opportunity. These projects are:

- a. Design, development and production of a complete UAV (Unmanned Aerial Vehicle) System consisting of the bird, auto-pilot, up-

link/down-link telemetry system, ground station and test equipment/ground support system.

- b. The Bionic Artificial Arm which operates through the signals generated by the brain. (Biocybernetics)
- c. Nanomaterial development for immediate stoppage of excessive bleeding in humans hurt in accidents/injuries.

The companies/projects picked up by the venture capital firm are from three diverse sectors, namely: Aerospace/Avionics, Medical Electronics/Mechatronics and Life-Sciences. Some of these companies would graduate out from our Technology Incubator into our country's first Technology Park at H-12 Sector and may create hundreds of new job opportunities in our city. Each of these projects could fetch billions of US. dollars revenue during their life cycle, if managed professionally. This would give impetus to our home-grown 'Silicon Valley' programme and introduce Pakistan to the global knowledge/innovation business circle.

Alongwith the NUST efforts in establishing the first Technology Incubation Centre and now moving towards the first Technology Park in its new campus at H-12 Sector, Islamabad, the IT and Telecom. Ministry has established the IT Venture Capital Fund to the tune of US\$ 50 million under the Pakistan Software Export Board (PSEB). All these endeavors of the government are likely to boost our high-tech industry and create new entrepreneurs with thousand of new job opportunities in the 21st Century technologies. Pakistan, would thus be put on the global map of emerging technologies country and a new Silicon Valley from Islamabad would emerge fully supported by the overseas Pakistanis and our friendly countries in the region.

Courses/Workshops
Schedule:

Courses/Workshop Calendar 2007

Month	Course Title	Duration	From	To	Venue
January	Computerized Accounting Using Peachtree	2 Weeks	31st Jan	10th Feb	TIC Park I
March	Six Sigma	3 Days	20th March	22nd March	TIC Park II
	Real Time Managerial Skills	4 Weeks	28th March	20th April	TIC Park II
April	Computerized Accounting Using Peachtree	2 Weeks	9th April	20th April	TIC Park II
May	Computerized Accounting Using Peachtree	2 Weeks	7th May	18th May	TIC Park II
	CAD/CAM/CAE (Power mill & Power Shape Pro)	2 Weeks	21st May	2nd June	TIC Park I
June	Workshop on "Harnessing the power of Entrepreneurship"	4 Days	4th June	7th June	TIC Park II
	CAD/CAM/CAE (Ansys)	1 Week	4th June	9th June	TIC Park II
July	CAD/CAM/CAE (Ansys)	1 Week	9th July	14th July	CCT&SM
	Computerized Accounting Using Peachtree	3 Weeks	30 th July	17th August	TIC Park II
August	Real Time Managerial Skills	4 Days	14th August	17th August	TIC Park II
	CAD/CAM/CAE	1 Week	20th August	25th August	TIC Park II
September	Workshop on "University-Industry Linkage"	1 Day	3 rd September	3rd September	HEC Auditorium
	CAD/CAM/CAE	1 Week	10th September	15th September	TIC Park II
	Computerized Accounting Using Peachtree	2 Weeks	17th September	29th September	TIC Park II
October	CAD/CAM/CAE	2 Weeks	1st October	13th October	TIC Park II
	Real Time Managerial Skills	4 Days	22nd October	25th October	TIC Park II
November	Lean Production Methods	2 Days	13th November	14th November	TIC Park II
	Computerized Accounting Using Peachtree	2 Weeks	12th November	23rd November	TIC Park II
December	CAD/CAM/CAE	1 Week	3rd December	8th December	TIC Park II
	Six Sigma	3 Days	11th December	13th December	TIC Park II
	Entrepreneurship Course	2 Days	31 st December	3 rd Jan 2008	TIC Park II

Confirmed:

Tentative:



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