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FITT FORUM

Newsletter of Foundation for Innovation and Technology Transfer, Indian Institute of Technology, Delhi

Welcome 2008

Team FITT wishes all its corporate members, various stakeholders and friends a joyous new year 2008. While we can look back at 2007 with a sense of satisfaction, more interesting has been the culmination of 60 eventful years of India's independence. Yet, as we move forward, the issue of comprehensive and inclusive growth in the midst of serious environmental concerns has to be adequately addressed. And, even while the country tries to sustain a high economic growth rate, it also has to reckon with rapidly changing market dynamics. Our knowledge economy which is seen more as an outcome of telecom and IT revolution continues to grow, despite fears of global slow down and some currency woes. Much of this can also be ascribed to robust domestic demand and suitable tweaking of businesses. But, it has to be sustained over a long term in the global context.

Each year brings technology-driven changes (a large number from IT / ITeS sectors) – some breakthroughs but, mostly incremental and we believe that a good balance between the services and the product models would help us secure and maintain technology leadership and economic stature. This would also call for creation of world class knowledge resources. In this respect, the leading research-based academic institutions can play a vital role – only if enough confidence is shown by the industry. We at FITT in IIT Delhi not only keep pushing knowledge networks and foster innovations but, also prepare people for knowledge based economy and society. Our 15 years of an exciting journey since inception has seen reinforcement of the industry-institute interaction albeit, in different formats. Our experiment in creating knowledge enterprises through academic spin-offs (primarily IT-based in the early years) is beginning to be noticed. We derive satisfaction from our efforts to see job seekers turning job creators even when the going is tough. Host of start-up successes with strong VC involvement is helping trigger entrepreneurial interest even in the traditional technology areas in India! We believe that strengthening the incentive structure to foster business models that encourage product innovation and development in the high technology verticals would propel a new generation of product enterprises that would help establish our real technological prowess. And in this process academia can be seen playing a significant role, preferably in partnership with industry and other organizations.

Anil Wali

Prof. S. Prasad, Director IITD, addressing the Convocation 2007

FITT invites Proposals from Industries for Collaborative R&D and Customized Training Programmes

For information please contact
Managing Director
FITT, IIT Delhi, Hauz Khas
New Delhi - 110016
e-mail: mdfitt@gmail.com

FITT invites corporate memberships from Industries and R&D organisations

Contact:
Mr. Partha Bhattacharya
e-mail: parthab@fitt.iitd.ernet.in

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Service Oriented Software

We all know that IT systems are needed to support all types of business. The use of IT is increasing as organizations are finding that use of good IT systems helps improve efficiency and effectiveness in whatever they do.

Though an organization may have an elaborate IT system consisting of many software applications (running on a network of diverse servers), most of the times these IT systems have evolved, not created together. Not only were they incrementally built, they were generally not built as per a major "master plan", as it is not possible to have a master plan in IT that will guide the development for long periods of time.

So inevitably most organizations have a situation where different systems are written using different software products and systems, perhaps running on different hardware systems. It is quite possible to have Peoplesoft for managing personnel, SAP for managing accounts, and supplier management built using Oracle, and yet another system running SQL server on Windows.

Diverse systems are also a result of mergers and acquisitions. Even if the a company uses all software and technologies that cleanly interoperates, if two companies merge, this uniformity will go away as different companies will clearly have different systems. Hence, diversity of systems has to be dealt with – we cannot plan to remain homogeneous.

With diverse systems, how does one build a new application to support a business process that needs to perform operations in different systems eg if a business process requires some data from SAP and some system based on flat files, running on different hardware, how does the application deal with these? If the application has to run on a UNIX server, how do we ensure that programs can easily interact with diverse existing programs to do their job?

This is a hard problem. Through networking, we know how to send data and files from one machine to another, and if all systems are same, we also know how to access files and other resources over the network. However, accessing diverse programs written in different languages and using different types of software products and running on different hardware is not easy. One can do it by writing highly specialized programs for doing this, but the job is clearly complex.

Recent development of Service Oriented Architecture (SOA) and Web Services (WS) has offered an alternative. Each application can be packaged as a web service, through which it defines a set of operations that can be accessed through the internet by other applications that may want to use this application using well defined standards and formats, which are mostly based on XML. So, by putting a "wrapper" around an existing application, it can be made into a web service with well defined operations available for other applications.

A very important attribute of SOA and WS is that they are based on HTTP, the protocol that is used for regular web browsing and web applications. The reason why this is critical is that now the network infrastructure in organizations is largely being determined by needs and specifications related to HTTP and network architectures are designed to easily allow HTTP based communication. At the same time, limits security and other such threats these networks often result in networks being very restrictive on other kinds of traffic. Hence, technologies that require special protocols for communication between different applications will find it hard to work painlessly in all environments (e.g. CORBA).

With the SOA model, applications are designed around using services from different smaller applications or components. It raises the level of programming for building applications from low level code development in some programming language to coordination and orchestration of different services being offered. This is another aspect of SOA that is quite exciting – it raises the level of abstraction at which an application designer has to operate.

With SOA and WS it is, for example, possible for an application that requires operations from different government departments to be automated without requiring all the different departments to accept some common technology or product suite. Even if the departments have evolved and built their internal software systems using a diverse range of technologies, by exposing their services as web service, they can be integrated with other applications.

So, for example, with WS it becomes possible for a passport office application to interact with police information system for verification, and tax department for tax clearance, and a university for verifying that the person indeed has a degree. Something that has to be otherwise done by non-automated processes even if all the departments have internal IT systems in which they keep their data, due to difficulties in integration. It is this power of allowing integration of diverse systems to build richer applications that is driving the rapid acceptance and use of SOA and web services.

Pankaj Jalote, Microsoft Chair Professor, Department of Computer Science and Engg.

Pervasive Sub-access Networks

The world of telecom networks usually starts with and ends on a addressable device on the customer – typically a access network segment which ends in a smart mobile phone or a PDA. For most of our communication purposes, this level of penetration into our telecom space is adequate – given that our typical mode of communication today is restricted to a voice call or a email (voice/data push or voice/data sink).

There is, however, a wealth of personal customer specific information available beyond this customer device – the so-called sub-access network – which could be of tremendous value for developing value added services. While wearable and communicating devices spring naturally to mind, recent developments in body area networks allow us to contemplate a world beyond mere wearable devices. This has gained more legitimacy recently - in Dec, 2007, IEEE approved the formation of the IEEE 802.15.6 Working Group for formulating BAN standards through its New Standards Committee (NESCOM) and the supervisory body, the IEEESA Standards Board.

As an example, we may consider what we could do if we could monitor aspects of personal information / vital signals monitoring like body temperature, heartbeat rate, levels of glucose / sodium or other electrolytes / oxygen, Electroencephalogram (EEG), Electrocardiogram (ECG), Electromyography (EMG) etc. Such information would allow several pre-emptive value-added applications to be developed – it would, obviously be valuable to be able to predict the onset of a epileptic seizure, or a impending cardiac episode, or a falling oxygen level in a patient with obstructive pulmonary disorder or a the onset of diabetic coma due to a falling blood sugar level.

Apart from the most obvious applications in healthcare, there could be several useful applications in personal entertainment / personal multimedia frameworks and personal authentication and validation which could come if these networks were ubiquitous or, at least, more wide-spread.

Several real-world issues arise when we look at any network located within or around a human body. These issues are centered, primarily, around whether the nodes are non-invasive / degree of non-invasion and if they can co-exist (as per 802.19 TAG) with other network elements, whether a high level of proximity is mandated between nodes, whether multihop routing is possible (or if each node must communicate point-to-point with a wearable gateway), what is the minimum node density we may require and the maximum node density we may achieve, the cost of each node , the energy efficiency and energy scavenging capacity of each node, whether nodes are simplex or not and, finally, if heterogeneous nodes may be allowed with multiple self-advertised and self-discovered capabilities.

While a low level of transmitted power is desirable – both to minimize interference and to address human health related concerns, it is to be noted that the human body presents a non-intuitive channel model to wearable / implanted devices.

One other concern is that of packaging - a inside-the-body network node (either swallowed and allowed to move through the GI tract, injected and allowed to move in the circulatory system or implanted in a organ of the body) which may then travel freely or transmit information needs to be packaged in a zero-fault mode.

Almost pressing concern is that of communication. While a wireless mode of communication would seem most desirable, it remains unclear if that is the most acceptable. Today, ultra wideband communication (IEEE 802.15.3) is emerging as an alternative to Zigbee (IEEE 802.15.4) and is a viable choice in some implementations. While the traditional concern in RF communication is to maximize the data rate to, say, 10 Gbps – in a typical body area network, the relevant issue in the Body Area Network (BAN) is to achieve a data rate of 100 kbps to 10 Mbps and to formulate a suitable channel model, specifically antenna radiating patterns which are more appropriate for the human body (specially around the head-ear region) and medically safe (in terms of the Specific Absorption Rate or SAR) for the UWB BAN.

The most desirable configuration would naturally be that of a set of heterogenous multihop nodes, either within or worn on a human body but not necessarily body-centric, with different capabilities which are both self-advertised and auto-discovered by other nodes on the network. As an example, we could consider a typical BAN consisting of three devices - an e-wallet, a ring based address book and a heart beat monitor. If a fourth device is inserted into this BAN system, say a swallowable pill-CAM which spends about four hours taking photographs of the GI tract and of possible ulcers before being finally excreted, we might want the pill CAM to be recognised automatically and made a part of the other BAN devices for those four hours it spends within the body.

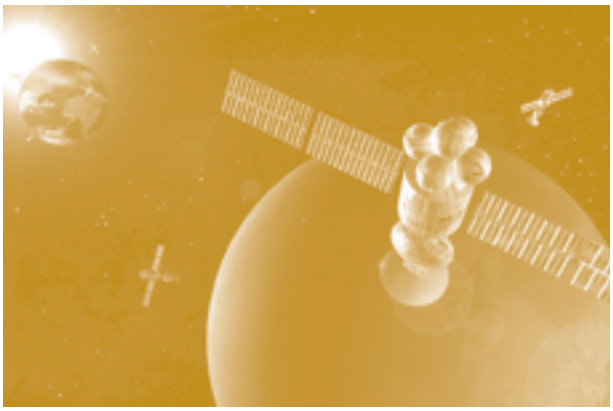
A few 'thought' applications serve to highlight how versatile these sub-access networks can be. A wearable diagnostic band is given to asthma patients in a doctor's waiting room to monitor vital parameters and then those requiring immediate attention are automatically prioritized for medical attention. A delegate tag in a conference allows your interest in being associated with particular working groups to be pre-marked – when one walks into a room for that work group, one's contact details are automatically exchanged with all other delegates in the room. A sub-cutaneous node implanted in a diabetic patient monitors blood sugar levels - at the onset of hypoglycaemia, in the middle of a busy street, it alerts the patient, a medical response team and discovers and summons the nearest doctor in the vicinity.

With the right application, and the right standards in place, and with the right inter-working protocols in place with the other WPAN technologies (such as 802.15.1-Bluetooth-1,802.15.2-Bluetooth-2 and 802.15.3-WiMedia) the sub-access network – enabled by the complementary developments in sensor networks, body area networks, personal area networks – should be a intriguing and fertile way of making technology personal again.

Subrat Kar
Professor, Dept of Electrical Engg & Bharti School of Telecommunication Technology and Management, IIT Delhi
subrat@ee.iitd.ac.in

Delhi Plays Catch-up in IIT Start-ups Race

Dressed in casual faded jeans and T-shirts, 27 year-olds Shishir Kumar Gupta and Vishal Chandra are not a typical chief executives of high-tech start-ups. What makes them different is that their companies have been incubated at the Indian Institute of Technology (IIT) Delhi. Gupta's Mechartes Researchers Pvt Ltd, which optimizes ventilation and air circulation services in buildings and readies designs to make them shockproof in the event of an earthquake, and Virtual Wire Technologies Pvt. Ltd, a wireless data company that Chandra leads, are attracting attention to an in-house tech incubation programme. Both are part of what is called a Technology Business Incubation Unit at IIT Delhi. The programme, running since 1999, typically allows young entrepreneurs to draw on the technical expertise at the IIT, research facilities and space, Internet, phone, fax and other



facilities at subsidized costs for three years. Also on offer is financial backing in the form of a seed loan of Rs.15 lakh at a nominal 3% interest. In return, the institute requires a technology based product or service that has the backing of a professor and a 5% equity stake. At Mechartes, which uses its software to design air circulation systems in urban settings, Gupta's team specializes in optimally placing fans and cooling systems to reduce costs and ensure air quality and human comfort. The company is close to signing a joint venture agreement with Swedish Ventilation company Systemair AB to take its services into global arena. Other services offered include vibration and shock isolation technologies that prevent damage to tall buildings and bridges during, say, an earthquake or a bomb attack. Revenues are not big at two-year-old Mechartes (it had a revenue of Rs. 35 lakhs in the year ended March), but its targets are ambitious. "This fiscal, we are expecting revenues of Rs. 1.25 crore," says Gupta, who gave up an admission at the Indian Institute of Management, Lucknow, to start Mechartes after working in the auto industry for two years.

Chandra's VirtualWire Technologies, which moved out of the IIT Delhi incubation programme, until this year had been focused on services for clients including the Indian Army, Shyam Telecom Ltd and state-owned Bharat Electronics Ltd, some of which work resulted in patents for its customers. Now, it wants to own such intellectual property. A 30-member team at VirtualWire is gearing up for a September 2008 launch of its first so-called ultra-wide band chip for short-range wireless applications for personal computers and laptops, which will, for instance, help stream video from a video player to a television set without cables. The prototype will be ready for venture firms by the year end; Chandra plans to present it as proof of concept ahead of a venture funding of up to $10 million (Rs.39.6 crore) in April. VirtualWire is the second successful start-up from IIT Delhi after Kritikal Solutions Pvt Ltd, a firm into computer vision and image processing. "Success begets success," says K.K.Roy, technical and administrative manager of the incubation programme at the institute. Occupancy at the incubation unit picked up after the success of Kritikal Solutions, which moved out of the unit in 2005. The Programme has incubated 19 firms to date and currently hosts eight start-ups.

(Source: Mint, 25-10-2007)

Tensor Technologies, ZestADZ to Launch Hindi SMS Service for Advertising

Tensor Technologies Pvt Ltd, a technology-based company in Delhi, has joined forces with ZestADZ, India's first mobile advertising marketplace, to launch an ad-supported Hindi SMS Solution called MeghDoot. MeghDoot uses mobile transliteration technology application which enables users to send Hindi SMS to almost any phone using an English Keypad. "MeghDoot is a milestone in local language messaging and it will take SMS messaging to the masses" said Shekhar, CEO of Tensor Technologies Pvt Ltd. MeghDoot has the world's first intelligent Mobile Transliteration Technology and runs on almost any type of phone. It sends hindi messages in the form of text or in the form of picture messages from one phone to the other. Users incur just the cost of a single SMS as priced by the operator, while sending messages to other users. The users receiving messages need not have T6 installed to receive hindi messages. ZestADZ is the advertising partner of MeghDoot and will enable the delivery of text and banner ads within the application thereby monetizing the application for T6India. The ads will be highly relevant, targeted, region specific and based on handset used by the user. "This partnership is a part of our effort in creating an open ecosystem of services to the subscriber which will be monetized through mobile advertising" said Asif Ali, Chief Technology Officer, mobile-work. " Such services is a win-win for both the subscriber and the publisher and an ad-supported model in the Mobile space is here to stay," he added.

(Source: The Economic Times, 10-10-2007)

Appin Security Group

Appin Security Group(ASG) is an Information Security Consulting and R&D organization and provider having a research and development centre in IIT Delhi. Some of the USPs of ASG are (i) Partnerswith Telecom consulting giant Telcordia for security services; (ii) served telecom clients including the PSU's MTNL and BSNL; (iii) High end technical implementation and auditing team with expertise in complex NOC's across different industry verticals; (iv) Vendor Neutral Consulting practices; (v) SOC to carry out technical penetration tests and ethical hacking exercises with MAC, Linux and Window servers to carry out attacking; (vi) Patent filed for Vulnerability Management System to ensure multilayered/multi platform testing for best results and removal of false positives; (vii) Patent filed for technology for next generation authentication systems for critical applications on the web. As regard to Appin's state of art SOC(Service-Oriented-Communication), it may be stated that ASG is the only SOC to have Apple MAC, Windows, Linux Servers; Scalable SOC to allow tunneling of Applications hosted in other organizations to allow remote testing of applications; Runs multiple softwares for application security testing for a comprehensive setup; Can test multiple applications simultaneously; Backup and Disaster Recovery implemented. A summary of achievements till now for ASG are (i) Security Assessment of Network Operations Center; (ii) Vulnerability Analysis and Penetration Testing of NOC's; (iii) Vulnerability Analysis of Web and Client facing Applications; (iv) Vulnerability Management and Patching Security critical IT assets of the NOC (Servers, Network devices, Applications); (v) Performed Business Impact Analysis; (vi) Modified the architecture of NOC to make it more secured; (vii) Developed Policies for Remote access, Operational Procedures & (viii) Reduced spending on Security devices and softwares.

For further information contact:
Mr. Anuj Khare
TBIU Block – I, IIT Delhi
E-mail: anuj.khare@appingroup.com

Silicon Valley VCs eye non - IT Startups in India

It's good news for Indian companies, especially, start-ups in non-IT sectors like speciality retail, financial services, media & entertainment and health care services. Moving away from their traditional haunts of IT and internet-related areas for investing in the US and other countries, some Silicon Valley tech-focused venture capital firms (VCs) are now looking at non-IT emerging sectors to invest in India.

(Source: Economic Times, 25-11-2007)

EnNatura Technology Ventures (P) Ltd.

EnNatura is committed to developing products and technologies in the energy domain with a keen focus on environment. The company intends to help reduce the dependence of the global economy on conventional raw materials and energy sources and to help make a transition towards a greener and cleaner future. In line with the company's vision, the team has developed their first product offering, "Environment Friendly Printing Inks".

The team has been actively involved in the development of vegetable oil based environment friendly inks for the past 10 months. Under the aegis of FITT, the organization has received a grant from the Department of Science and Technology (DST) for the lab scale process development of these inks. The company has successfully completed the process development for the bench-scale production of multi-colour (CMYK) inks and are currently engaged in pilot scale process development and commercialization of these inks under the brand name – Litho-Natura Inks.

Product offers following health and economic benefits:

- Litho-Natura Inks are free of any Volatile Organic Compounds (VOCs) that are present in the conventional petroleum based inks, ensuring a cleaner pressroom and safer environment.
- Vegetable oil based inks are washable with a properietary "VOC free wash solution" as opposed to hydrocarbon solvents that are used as wash solutions for conventional inks, making it the only VOC free ink in the country.
- Being developed on a renewable raw materials platform, ink costs and printing costs are lower vis-à-vis petroleum based inks.

For Further information please contact:
Mr. Sidhartha K. Bhimania
CEO, EnNatura Technology Ventures (P) Ltd
TBIU, IIT Delhi
E-mail: skbhimania@gmail.com

Care Pro Biotechnologies

Care Pro Biotechnologies (CPBt), incubated in TBIU, IIT, Delhi is a company engaged in technology development and research collaboration for product development. The company with the aid of latest technologies and research team is dedicated for the development of biotechnology based products mainly atrributed for the betterment of agriculture and environment. It has developed working relations with some key R & D Institutes in the country.

The main focus of CPBt, currently is development of:

- Fermentation based high yielding/quality microbial products for agriculture sector.
- Microbial consortium for sodic soil reclamation.
- Enzymes to be used in animal feed
- Isolation, enumeration and screening of petroleum degrading population.
- Application of the potent strains to the contaminated site to clean up the petroleum contamination.

LeadInvent Technologies

LeadInvent Technologies Pvt. Ltd is a spin off company from IIT Delhi's premier Supercomputing Facility for Bioinformatics and Computational Biology (SCFBio) (www.scfbio-iitd.res.in). Started by industry experts and faculty, scientists from SCFBio in November 2006, the company has evolved into a knowledge based company. LeadInvent (LI) vision is to provide cutting edge R&D solutions to life science industry. Company core strengths are its proven molecule simulation technologies in areas such as three dimensional protein structure prediction and lead molecule discovery. Considered to be pioneers in high performance bio and chemo informatics, LI team brings with it extensive research experience in life science fields with core Chemistry, Biology, IT and Mathematics knowledge.

Binging out medicine in the market is a costly and time consuming process. LI leverages the power of computer aided drug design (CADD) to reduce such time and cost for a typical drug design activity. The team employs computational biology strategies in high performance compute environment to design and develop lead like molecules that could be realized as therapeutic medicines. The technology has been demonstrated to be highly successful in distinguishing drug molecules (active molecules) from non drugs in various international journals. It is a highly customizable knowledge with application in faster & better design of targeted drug libraries. LI offer R&D service around such scope of work and is under process of developing stand alone simulation products that could be deployed at client side.

For predicting protein structures LI offers a complete high performance compute simulation approach to predict three dimensional structures of proteins. The methodology is unique in its non dependability on databases to model new protein structures. The application has tested on several compute platforms including blue gene supercomputer from IBM.

For further information contact:
LeadInvent Technologies Pvt. Ltd.
TBIU Module 5 & 6
IIT Delhi, Hauz Khas,
New Delhi-110 016
Ph: +91-11-26581524 extension: 6
Mob: +91-9910122566
Web: www.leadinvent.com,
www.scfbio-iitd.res.in

Mecharte's Researchers

Mechartes provide services and develop software products in the domain of Computer Aided Designing (CAD), Finite Element Methods (FEM) and Computational Fluid Dynamics (CFD).

Services

Mechartés uses a combination of analytical and numerical tools to simulate real life phenomenon and compare them with experimental observations.

The company's focus is on providing following services :

1. Thermal & Flow Analysis
2. Acoustic Analysis
3. Crash Analysis
4. Vibration and Modal Analysis
5. Structural and Stress analysis

The organization's services have applications in following sectors:

1. Automotive, Railways and Aerospace
2. Heat Ventilation and Air Conditioning (HVAC)
3. Constructions and Infrastructure
4. Defense and Space
5. Oil and Natural Gas
6. Power Sector

Products

Software products by Mechartés are complimentary to company's service portfolio. The products automates repeated activities in providing certain kind of services. These products we call them as Customized Simulation Packages (CSP's), can simulate completely specific mechanical components. These packages use analytical and numerical methods on a single platform along with experimental database. So far we've developed CSP's for Disc Horn (Acoustic simulation), Shell & Tube Heat Exchanger (Thermal Simulation) and Silencer/ Muffler (Acoustic Simulation)

Mechartés is currently developing a generic CAD tool, *Triaami* which seamlessly integrates modeling and analysis environments utilizing the web interface. A powerful modeling environment that enables modeling of complex constructs. The products by Mechartés use Open Graphics library for graphics interface along with numerical and analytical algorithms for developing products. The company extensively utilize large number of open source resources for quick development times.

For further information, please contact:
Shishir Kumar Gupta Mechartés
Researchers Pvt. Ltd. Module 2, TBIU Block,
IIT Delhi, Hauz Khas, New Delh
Tel: +91-9810972971
E-mail: shishir@mechartes.com
Website: http://www.mechartes.com

On Yo Mo

On Yo Mo provides search over and accompanying services for structured data. It consists of a platform that implements the search and an application that uses the implementation. The application validates On Yo Mo's platform. It enables search on consumer categories. The consumer search is available for Indian cities. The company has entered innovative co-marketing tie-ups with leading consumer brands to increase visibility.

For further information, please contact:
Shailesh Mehta
On Yo Mo
TBIU, Block –1, Extension, Suite 7
IIT Delhi, Hauz Khas, N.Delhi-110 016
E-mail: info@onyomo.com

PM Pledges More Funds for Science and Tech-Scholarship for Innovation, Higher Education on the Cards

The Prime Minister. Dr. Manmohan Singh, has reiterated his assurance to increase the annual expenditure on science and technology from less than one per cent of GDP at present to 2 per cent in the next five years. He made the promise in Andhra University here after inaugurating the 95th Indian Science Congress on Thursday. "After the last Science Congress, I gave you my assurance that we are willing to double the expenditure on science and technology. The assurance stands," he told the delegates. Dr. Singh said a programme would be launched to give science innovation scholarships of Rs.5,000 each to one million students over the next five years and scholarships for higher education, providing 10,000 scholarships per year of Rs 1 lakh apiece, to attract talented students to graduate and post-graduate courses in science. In general, said the Prime Minister, his Government was committed to more in education, especially science. " The allocation for education has been stepped up from 7.7 per cent of gross budgetary support in the Tenth Plan to over 19 per cent in the Eleventh Plan. We are planning to fund 30 new Central universities, five new Indian Institute of Science Education and Research, eight new IITs, seven new IIMs, and 20 new institutes of information technology", he said.

(Source: The HINDU Business Line, 04-01-2008)

Entrepreneurship Can't be Nurtured in Classroom

Entrepreneurship cannot be taught in the classroom but can be imbibed only in a practical environment. This was the message that entrepreneurs and academicians strongly endorsed at an international conference on global entrepreneurship organized by SRM University, Chennai. The four-day meet, in which ET was a media partner concluded on Saturday. Teams from different colleges took part actively in the business plan competition. The meet also had panel discussions on subjects such as women entrepreneurship and social entrepreneurship. MindTree Consulting co-founder and CMD Mr. Ashok Soota said that entrepreneurship is a far more attractive career option now. While conserving cash was important, he felt entrepreneurs should not be over-defensive. "The entrepreneurial education should not be theoretical. It's all about timing, inclusive growth," Mr. Soota said. Mr. Soota further said that entrepreneurs should not dilute their share too much in the flagship company they own. Also, instruments such as communication and empowerment can help in retaining employees. ISB, Hyderabad professor Kavil Ramchandran was also of the view that Entrepreneurship Education should not be taught as a theory paper, rather student should have hands on training in simulating environment to develop fresh ideas.

(Source: The Economic Times, 23-12-2007)

Idea + VC = Fortune Formula

Money is power but idea rule the world. Or so goes the common wisdom. But what really is the worth of an idea today and how do you measure it? Is it enough to just come up with that cracker of an idea and leave the execution to others or does money have an important role to play to get that idea to start producing revenues? Sunday ET spoke to an entire canvas of VCs, professionals and entrepreneurs to find out which way the wind is blowing. A few wannabe entrepreneurs with an idea, that SundayET spoke to, feel that they are not being given a respectable share in equity. Similarly, another start-up entrepreneur says that VCs takeover the management and divert the idea to an entirely different direction. In still other cases, the company is valued very low from the start, which creates a problem for the entrepreneur later. And although they would have you believe that the VC industry operates in an organized fashion, but in reality, most valuations, projection and targets of revenue potential of ideas is done on a very arbitrary basis. That is what the entrepreneurs or the ones with the ideas would have you believe. But VCs have a different take on it. "Idea is just a conjecture. What the VC look for today is a great team which can perform under any circumstances. Idea may evolve or change over time," says Praveen Gandhi, President of the Mumbai chapter of TiE (The Indus Entrepreneurs) and managing partner SEEDFund, which has stakes in AgencyFaqs, Redbus, Printo and Carwale. Sandeep Singhal of Nexus India Capital agrees, "An idea is often not enough. We have to see whether the person with the idea has the resolve to leave the job he is working on and can form a team with specialists looking at various functions", he pointed out.

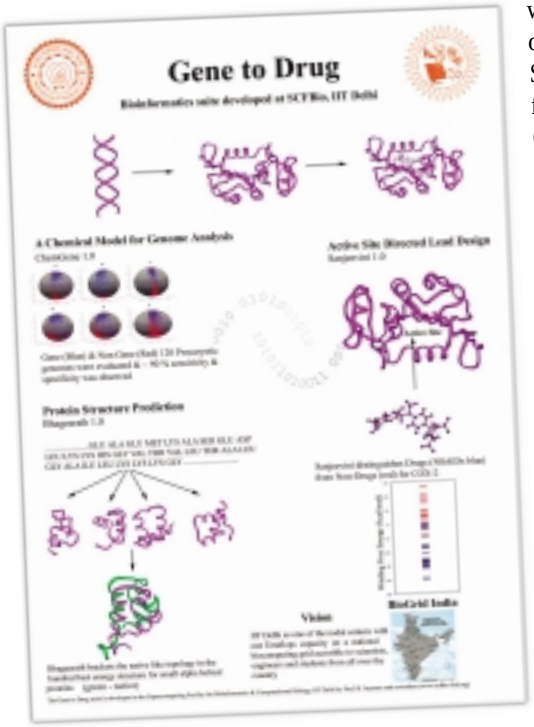
(Source: Economic Times, 23-12-2007)

Focus on Distinguished Faculty of IIT Delhi

Dr. Jayaram joined IIT Delhi as a faculty in the Chemistry Department in 1990. Prior to this, he obtained his Ph.D. in Chemistry from the City University of New York (1986) under the guidance of Prof. David Beveridge, a renowned quantum chemist and one of the world's leading experts in DNA modeling. Dr. Jayaram's thesis work was concerned with developing methodologies to model nucleic acid constituents at atomic level under aqueous conditions on what was then one of the largest computer installations of IBM in mid-town Manhattan. After his Ph.D., he took up a Post Doctoral assignment with Prof. Barry Honig, a pioneer in Biomolecular Electrostatics and Bioinformatics, at Columbia University, USA. Dr. Jayaram's contributions on electrostatics of DNA have eventually found their way into Delphi software of what was formerly Biosym and now Accelrys. Subsequently he worked as a Senior Research Associate with Prof. Beveridge at Wesleyan University where he developed methodologies to help understand the energetics of Biomolecular recognition.

Dr. Jayaram's thesis work was concerned with developing methodologies to model nucleic acid constituents at atomic level under aqueous conditions on what was then one of the largest computer installations of IBM in mid-town Manhattan. After his Ph.D., he took up a Post Doctoral assignment .

At IIT Delhi, he started building the infrastructure to carry out biomolecular modeling and creating the science and the software pursuing the dream of developing indigenous *in silico* solutions for personalized medicine (individual specific drugs with no side effects). A result of these efforts is the Supercomputing Facility for Bioinformatics & Computational Biology (SCFBio) at IIT Delhi, and the *Gene to Drug* suite of softwares (www.scfbio-iitd.res.in). The SCFBio currently hosts about 200 processors with a compute capacity close to 750 GFlops and four terabytes of storage and is made freely accessible to the student and scientific community from different parts of the country. The *Gene to Drug* software suite, accessible over the net freely, comprises Genome Analysis programs (*Chemgenome*), Protein Structure prediction programs (*Bhageerath*) and computational tools for Drug Design (*Sanjeevini*). *Chemgenome* is a novel successful step towards deciphering the language of DNA from an energetic perspective. *Bhageerath* is one of the very few *de novo* protein tertiary structure prediction web-servers for small proteins across the globe. The *Sanjeevini* protocols are of immense value in new drug discovery. The SCFBio website is accessed by users from more than 30 countries (www.scfbio-iitd.res.in/usage).



Prof. Jayaram published and presented over 100 papers in refereed international journals of high impact and in national and international conferences. He has supervised 12 Ph.D. students (9 completed, 3 in progress) and several M.Tech., M.Sc. and B. Tech. Project students. Prof. Jayaram has been a consultant to HCL Life Sciences Division and Dabur Research Foundation. *Leadinvent* (www.leadinvent.com), a start up company based on *Sanjeevini* for customized computer aided drug design for Pharma industry, formed by his former students and project scientists is currently under incubation under the aegis of FITT at IIT Delhi.

Jay as he is lovingly known in the West, believes that he is close to understanding the language of DNA, that the protein folding problem, the holy grail of molecular biology, unsolved for the last 55 years, is an Indian problem and that there would be an Indian solution soon. He is proud of being instrumental in creating children's parks in IIT Delhi. A flutist by passion and a long distance runner, he intends to participate in New York Marathon and dreams of climbing Mt. Everest one of these years.

Prof. Jayaram was awarded the CRSI (Chemical Research Society of India) medal in 2000 for contributions to research in Chemistry. He is a member of the National Task Force on Bioinformatics of the Department of Biotechnology, Govt. of India and Bioinformatics Task Force of the Ministry of Information Technology. He is a Vice President of the Indian Biophysical Society. He is a member of the Programme Advisory Committee for Physical Chemistry (2004-2006) and Organic Chemistry (2006 onwards) of the Department of Science and Technology. Prof. Jayaram is also a member of the national committee of IUPAB.

Prof. Jayaram B. Ph.D. (CUNY, USA)
Professor & Head, Department of Chemistry& Coordinator, Supercomputing Facility for Bioinformatics and Computational Biology
Email: bjayaram@chemistry.iitd.ac.in
Website: www.scfbio-iitd.res.in

Focus on Distinguished Faculty of IIT Delhi

Shiban K Koul received the B.E. degree in Electrical Engineering from the Regional Engineering College, Srinagar in 1977, and the M.Tech. (1979) and Ph.D (1983) degrees in Microwave Engineering from the Indian Institute of Technology, Delhi, India. He served as a Senior Scientific Officer (1979-1988), Associate Professor (1988-1991), Professor (1991-), Head Centre for Applied Research in Electronics (C.A.R.E) (1993-1996,2002-2005), Chairman Advisory Committee of Library (1997-1999), Head Computer Services Centre (1999-2002) at the Indian Institute of Technology, Delhi. Currently, he is a Professor at Centre for Applied Research in Electronics at IIT Delhi. He has held several visiting assignments abroad: Senior Visiting Fellow at the Department of Electrical Engineering, National University of Singapore (Dec.1996-Dec.1997); JSPS Fellow at the Tohoku University, Sendai, Japan (July 1995-Sept 1995); Visiting Scientist at the Tohoku University Sendai, Japan (Oct. 1994-Dec.1994), and British Council Fellow at the University of North Wales, UK (July 1984-Dec 1984). He is the author/co-author of 130 Research Papers; 7 state of the art books, *Stripline-like Transmission Lines for Microwave Integrated Circuits* (Wiley Eastern Ltd., 1989); *Analysis, Design and Applications of Fin Lines* (Artech House, 1987); *Microwave and Millimeter Wave Phase Shifters, Vol. I- Dielectric and Ferrite Phase Shifters; Vol. II - Semiconductor and Delay Line Phase Shifters* (Artech House, 1991); *Finline CAD for DOS-Analysis and Design Software for Millimeter Wave Integrated Circuits* (New Age International Publishers, 1996), *CAD of Millimeter Wave Finlines- Analysis and Design Software for Windows*(New Age International Publishers, 1997), *Millimeter wave Dielectric Integrated Guides and Circuits* (John Wiley & Sons, 1997) and a Chapter on *Materials and Technology for Microwave Integrated Circuits* in a book Microwave Materials (Ed. Murthy et al, Narosa, 1993). He has guided 4 PhD thesis, more than 85 M.Tech thesis and 4 B.Tech / MSc thesis. He has delivered more than 100 invited talks in India and abroad in the last 10 years.

Prof. Koul has received Gold Medal by Institution of Electrical and Electronics Engineers Calcutta (1977); S.K.Mitra Research Award (1986) from the IETE for the best research paper; Indian National Science Academy (INSA) Young Scientist Award (1986); International Union of Radio Science (URSI) Young Scientist Award (1987)

Prof. Koul has received Gold Medal by Institution of Electrical and Electronics Engineers Calcutta (1977); S.K.Mitra Research Award (1986) from the IETE for the best research paper; Indian National Science Academy (INSA) Young Scientist Award (1986); International Union of Radio Science (URSI) Young Scientist Award (1987); the top Invention Award (1991) of the National Research Development Council for his contributions to the indigenous development of ferrite phase shifter technology; VASVIK Award (1994) for the development of Ka- band components and phase shifters; Ram Lal Wadhwa Gold Medal (1995) from the Institution of Electronics and Communication Engineers (IETE); and Academy Excellence award (1998) from DRDO (Ministry of Defense) for his pioneering contributions to phase control modules for Rajendra Radar. He is a Fellow of the Indian National Academy of Engineering (INAE), Fellow of the Institution of Electronics and Telecommunication Engineers India, Fellow of the National Telematics Forum, Senior Member of the IEEE, Member of the New York Academy of Sciences, Member of the Micro and Nano Technology Foundation (MANCEF), USA, Member of IEICE (Japan), Member of the Indian Society of Smart Materials (ISSS), Member of the General Advisory Committee (GAC) of Micro and Nano Technology Foundation (MANCEF), USA and Chief Delegate for world Micro machine Summit from India. He is the chairman of the Editorial board of IETE Journal of Research, a member of the National Committee for URSI Commissions B&C, academic expert member on the board of smart materials and research (B-smart) and a member of the national committee of COSPAR-URSI-SCOSTEP. He is on the Editorial boards of Journal of IETE, International Journal of RF and Microwave Computer-Aided Engineering and the Microwave and Optical Technology Letters, John Wiley, USA. He has served as the Chairman of IEEE ED/MTT Chapter, India Council in (1988,89, 1992,93,94,95). He is a consultant to several Government organizations and private industries in India and abroad. He has successfully completed 95 major sponsored, consultancy and Technology Development Projects. He holds 6 patents and 3 copyrights. He is on the board of Directors of M/S Astra Microwave Pvt. Ltd, a major private company involved in the Development of RF and Microwave systems in India. He is currently handling projects on the development of novel millimeter wave components at 140 GHz and RF component development using MEMS technology at 17 and 35 GHz.

The RF and Microwave Group under the guidance of Prof. Koul has successfully transferred know-how on two educational Kits, Advanced Microstrip Trainer Kit and Antenna Trainer Kit, to private industry in India for production. Current research areas of Prof. Koul include microwave and millimeter wave circuit design using suspended stripline and dielectric integrated guides, RF MEMS, planar antennas and device modeling.

Prof. S. K. Koul
Centre For Applied Research in Electronics (CARE) IIT Delhi
Email: skkoul @careiitd.ernet.in

Automated Security System for Vehicle Entry-Exit Control

A security system for vehicle entry-exit control was developed at IIT Delhi with a funding of Rs. 132 lacs from the Ministry of Communication and Information Technology. The system has two parts —a vehicle underside scanner and a vehicle authorization system, which can be used independently as well as in conjunction with each other.

Vehicle Underside Scanner (VUS)

This is a camera based system for viewing the underside of vehicles in order to detect undesirable objects such as explosives. As compared to the traditional approach of mirror based inspection, this system has the advantages of being faster and more accurate. Further, it provides a complete and comprehensive view of the vehicle underside in one go.

This system basically deals with the problem of how to see the entire undercarriage in spite of limited field of view of an individual camera, poor illumination below the vehicle body and the requirement of capturing images while the vehicle is in motion. The system has two parts – a Vehicle Scanning Device

and a Gate Station Unit. The Vehicle Scanning Device (shown above) consists of four identical units mounted in a row, each having a cameras and an arrangement of LEDs. The LEDs illuminate the undercarriage and the cameras capture images as a vehicle moves over this device.

The Gate Station Unit is equipped with a PC which receives video frames from the four cameras. Frames from each video are stitched to form partial images (vertical stitching) and then the four partial images are stitched together to form a complete picture (horizontal stitching). The reconstructed image is displayed along with a reference image for inspection by a security guard. The system provides the convenience of zooming and panning of the image.

The key IP developed here is a sophisticated computer vision algorithm for vertical and horizontal stitching of video frames, ensuring quality of the overall image. It exploits multithreading, multiprocessing and pipelining for achieving a high speed of operation required to process nearly 300 images in 5 sec. Additional critical issues that have been handled are synchronization of video streams within 1 ms, alignment of cameras within ±2 pixels in 320x240 frames and control of the light intensity.

In comparison to single camera based scanning systems, use of four cameras reduces the blind zones formed due to occlusion. The single camera systems typically use a line scan camera which is susceptible to image distortion if the vehicle speed is non-uniform. Also, a single camera system requires a wide angle lens leading to a non-uniform resolution. Other multiple camera based systems either have no image stitching and display raw videos giving constantly changing views, or have incomplete stitching, resulting in images which are difficult to interpret and draw inferences.

The system can be deployed either below the ground surface (in a pit) forming a permanent installation for security of important buildings/premises, such as Parliament, Vidhan Sabha, Defense establishments, Govt. offices, Embassies, Airports, etc., or above the ground surface (with ramps) forming a temporary installation for important events, e.g., public meetings, conferences, exhibitions, VVIP visits, etc.

Vehicle Authorisation System (VAS)

This system can be used to restrict the passage through entry/exit gates of a premise only to authorized vehicles driven by authorized drivers. As compared to the usual card/token based systems, it is much faster, more secure and less error prone. It can provide controlled access to external users while causing least obstruction to regular users. Thus it can help in security

of the premise as well as prevention of vehicular theft.

Our solution involves a database of registered vehicles/drivers, a device with unique ID installed in each registered vehicle and a control unit on each gate. Each registered driver carries his/her ID in a smart card which is readable by the vehicle device. The adjoining picture shows a vehicle device with a smart card inserted in it. The authorization check is carried out using a dual Authentication mechanism in which both user and vehicle are authenticated. Each vehicle is authorized to be driven by specific driver (s) and each driver is authorized to drive specific vehicle (s).

The control unit on a gate interrogates the vehicles as they approach the gate and the response received from the vehicle device, if present, is checked against the database of registered vehicles and drivers. Checking at entry gates is to prevent unauthorized entry and checking at exit gates is to prevent vehicle theft. The control unit is shown in the adjoining picture. The communication between a control unit and a vehicle device is infrared based and uses DES encryption for security. Use of infrared makes it easier to have a reasonably narrow beam (as compared to RF communication) so that closely spaced vehicles are properly resolved. Wireless / contact less operation between the control unit at a gate and vehicle device + smart card in the vehicle permits unhindered passage of registered vehicles at reasonable speeds. Since the vehicle devices are powered by dry cells and smart cards derive power from these devices, the design of these devices (hardware and firmware) has been done to conserve energy.

The following companies have contributed to the development of this security system - Kritikal Solutions, Expert Software Consultants and Net Globe Technologies. The Cabinet Secretariat supported field trials of the prototype system.

Prof. Anshul Kumar
Department of Computer Science & Engineering (CSE) & Head, Department of Mathematics, IIT Delhi
E-mail: ansul@cse.iitd.ernet.in

MBA @ IIT Reloaded

The Department of Management Studies (DMS), Indian Institute of Technology (IIT), Delhi, has resumed admission to its part-time MBA programme this year, after a gap of two sessions. "According to Prof. Surendra Prasad, Director, IIT-D, "Emerging market requirements show a need for technicians who are also adept at working out the cost involved in various stages of production. Engineers with expertise in management and finance are definitely an asset to any industry, and are paid better salaries than those with just technical skills." IIT-D's part-time MBA programme focuses on technology management, a combination technology and management. Explains Prof. S.S. Yadav, head DMS. "The management of technology comprising two things – first, the management of a collection of systems, infrastructure, and information, and second, the management of information technologies as a business function; hence the focus of our programme."

"Working professionals with a BTech/MSc degree or a Master's in economics, commerce or any other relevant subject, may seek admission for next year's intake," adds Yadav.

(Source: Education Times, 20-08-2007)

Award

Prof. Alok Ray, Centre for Biomedical Engineering has been awarded "Tata Innovation Fellowship" for the year 2007-2008. The award is given in recognition of his outstanding research contribution in the area of material used in Human Medicine and Surgery.

Achievement

Prof. A S Brar, Department of Chemistry, IIT Delhi has been appointed as the New Vice Chancellor of Lucknow University.

In the Offing: a New Technological Model to Reduce Queues for Service

Applicants for visas or those planning to selling their cars usually need to go through long queues to get official attestations on multiple copies for verifying the authenticity of identity proof(s). The process becomes increasingly frustrating as a bagful of documents needs to be carried to government offices, apart from praying for the mercy of the coveted signature. An IIT-Delhi professor

Dr. Pankaj Jalote is now working on a model which would help cut short such long waits. Once the model is implemented, any authorized person can check records at the registration office, the bank and the police department and clear the sale, the professor said. The model is very robust as this information exchange will happen over the internet and will be available through web browsers like Internet Explorer and Mozilla. "The model, however, is not without roadblocks". Softwares used by various departments and corporations today are tailor-made for their own operations. The departments also use different operating systems like Windows, Sun or Linux, and different hardware," says Jalote. The proposed model is thus being designed to enable information sharing without modifying existing softwares.

(Source: Express Newsline, 29-08-2007)

Smart Fabrics are in, IIT Delhi to Make it Fashionable

The textile technology department of the Indian Institute of Technology (IIT), Delhi, has bagged a Rs.17-crore grant from the Department of Science and Technology, Government of India, to develop and research smart textiles. The premier institute, with an additional investment of Rs.3 crore from the industry is now set to start a state-of-the-art research facility on campus to carry out research and development on next-generation textiles. The institute is already working on smart textiles- some are self-cleansing, some thermo-regulated, some odour-resistant and there are others meant for use as filters in the automotive industry. Now, textiles with these specifications will be developed in collaboration with the Indian Industry and the technology will be scaled up for commercialisation of the products. An IIT team headed by Dr. Ashwini Agrawal and

Dr. Manjeet Jassal is also working with Dr. Radhika Tondon of the All-India Institute of Medical Sciences (AIIMS) to develop ophthalmic implants using some of these nano-materials. "This is the largest project of its kind for IIT Delhi in terms of finances as well as industry involvement, a result of two years of hard work. It is set to give a boost to the textile technology industry. We are already under threat from other countries such as China in this sector," said Dr. Agrawal, an associate professor at the institute's department of textile technology. He explained: "Smart textiles can be used in almost every industry, besides apparel. Uniquely designed nano-particles are being developed, particularly for self-cleaning and odour-resistant fabrics. When sunlight falls on these nano-particles applied to fabric, thy will break down dirt or microbes." The project team includes 23 staff members and students, including those pursuing a PhD, and in the M Tech and B Tech streams.

(Source: Express Newsline, 16-11-2007)

Workshop on "Environment Management in Thermal Power Stations"

A workshop on "Environment Management in Thermal Power Stations was held under the aegis of FITT in the Centre for Energy Studies, IIT Delhi. The co-ordinator of the Workshop was Prof. D. K. Sharma of the CES, IIT Delhi. The Workshop was held from October 03-05, 2007. There were 21 participants for the course from Thermal Power Stations, Industries and Academic Institutions.

Workshop on "Trends in Image and Video Processing"

A workshop on "Trends in Image and Video Processing" was held under the aegis of FITT in the "Department of Electrical Engineering, IIT Delhi. The co-ordinators of the Workshop was Dr. Brejesh Lall & Dr. Sumantra Dutta Roy of the Department of Electrical Engineering. There were 30 participants for this workshop from Industries and Academic Institutions. This workshop was held from Dec 12-15, 2007.

Achievement

Mr. Jaideep Bihani, MD, Bihani Manufacturing co. Pvt Ltd, received the "National Award-2006" given to Small Scale Entrepreneurs. He received the award at a function which was held on 30th August 2007 at Vigyan Bhawan, New Delhi. Mr. Bihani is the former Governing Council Member of FITT. Bihani Manufacturing is the Corporate Member of FITT.

Short Course on "Analysis, Design and Construction of Structures"

A short course on "Analysis, Design and Construction of Structures" was held under the aegis of FITT in the Department of Civil Engineering of IIT Delhi from 21-23 December 2007. The coordinators of the course were Dr. Suresh Bhalla and Professor B. Bhattacharjee from the deptt of Civil Engg, IIT Delhi. There were 25 participants for this course from Industries & Academic Institutes.

Dr. Suresh Bhalla delivering a lecture at the workshop

Why Nano is a Great Example of Innovation

According to Professor Vijay Govindarajan, the Earl C. Daum 1924 Professor of International Business and director of Tuck's Center for Global Leadership, Tata's Nano is a landmark event for a variety of reasons. Its innovation points to a whole new set of consumers, who did not have access to the car earlier. In a way, he thinks that it is like a revolution that the PC and Apple's iPod sparked. It is as important an event as India winning its independence or India launching its first satellite. Professor Govindarajan also like to think that it is going to fundamentally change the way the automobile sector functions. And here is why. For the first time, thanks to Tata's Nano, India has been established as an R&D leader, and not just a low-cost hub known for cheap labour. It has shown to the world that India can be a technology leader. According to him when we talk of Tata's Nano, we are not just talking about low-cost, we are talking about high technology. Even a DVD player in some US cars are priced over $2,000- this just goes to explain the significance of the Tata Nano. The Tata Nano will certainly find big takers in India. However, it can have a market in the US, as well. If the car is enriched with high technology functions to mark it an intelligent car, many in the US will look forward to own it. An intelligent car at $3,000 would be a good bargain after all, for many Americans. Tata's Nano shows that there is a huge opportunity for Indian companies to build profitable low-cost products and then take them to the US. Prof. Govindrajan thinks that Tata Nano has fundamentally followed the Forget, borrow, learn' model of innovation. It forgot the way it made money or operated in its earlier businesses. It realized that to innovate it would have to embark on a completely new theme. Its borrow challenge was to put some of its effective capabilities to use-selectively use its current technology for the breakthrough project. Finally, it also learnt to test and resolve the many assumptions that go with such an ambitious project. The Tatas realized that for a poor country like India, there was a need of an ultra-low cost product and they offered it by leveraging the power of technology. The volumes are all there in India, one needed someone like Ratan Tata to overlook the thin margins but invest in world-class technologies to offer an affordable good product to the market. Most of all, Tata's Nano is a great innovation, because innovation is all about thinking of the next decade and not the next quarter.

(Source: Hindustan Times, 15-01-2008)

Some ICT technologies available with IIT Delhi

S.No.	Patent Title
1	A gun diode oscillator in suspended stripline configuration with evanescent guide termination
2	Flat Antenna to transmit and to receive the circularly polarized signals
3	Suspended Stripline to Non-Radiative Dielectric Wave Guide Transition
4	Hybrid Integrated non-radiative dielectric wave-guide coupler
5	Random number generation using chaos function
6	A system and method for error correction using trellis codes
7	A system and method for preventing hacking of digital information
8	A cryptographic apparatus and method thereof
9	An apparatus and method for accessing computer data and surfing the Internet by a display unit using wireless communication
10	A smart communication system for OFDM/OFDMA and SCFDE and Method of operation thereof
11	A system and method for achieving contention free beacon transmission
12	A system and method for achieving low power consumption in ad-hoc wireless LANs
13	A system and method for achieving high throughput in ad-hoc wireless LANs
14	A System and method for blind multi-users (MU) detection of BPSK-DS-CDMA signals
15	A dispersion compensated broadband optical communication link
16	Segmented-clad fiber design with tunable leakage loss
17	Tracking of mobile target with a selected pair of sensors
18	Technology for multi-perspective video analysis
19	A system & method for non-destructive characterization of composites

Patent Rule Change to Aid Biodiversity Protection

An October proposal at the Council of Trade Related aspects of Intellectual Property Rights, or TRIPS, of the World Trade Organization (WTO) that suggested compulsory declaration by patent applicants world-wide of the source of origin of any data related to natural resources is expected to substantially help India to protect its vast biodiversity and traditional knowledge from being exploited by private organizations that don't share the benefits with local communities where the products originated. The proposal, mooted by Peru and supported by several countries, including India, Brazil and Tanzania, has now led to an amendment to the TRIPS rule. A deadline for the amendment has also been extended to end-2009 as it requires the ratification of about 100 countries.

(Source: Mint, 26-11-2007)

Indian Patent Office Gets Global Recognition

The Indian Patent Office has been recognized as the International Searching Authority (ISA) and International Preliminary Examining Authority (IPEA) by the World Intellectual Property Organisation (WIPO) consisting of more than 170 member countries. This would enable Indian companies to apply for global patents by filing their applications in India only. As an ISA, major functions of the Indian Patent Office will be to approve or establish the title and conduct international searches. The patents granted would be applicable in all the WIPO member countries.

(Source: The Hindu Business Line, 29-12-2007)

Overhaul India's Patent Processes

Acknowledging systemic problems with India's patent offices, the National Knowledge Commission, under the chairmanship of Sam Pitroda, has called for a complete overhaul in the patent examination system. As per the commission's recommendations, patent examination procedures, practices and decisions in patent offices should be streamlined. It also suggested that a new detailed manual for examining patents should be created. The recommendations were made after consulting industries, lawyers, scientists and technocrats.

(Source: Mint, 03-01-2008)

List of Patents in the Pipeline since June 2007

S. No.	Title	P. I. & Deptt./Centre
1	Direct Ethanol based Alkaline Fuel Cell	Dr. S. Basu, Chem. Engg.
2	An Induction Motor based High Efficiency Fan	Prof. K. R. Rajagopal, DEE
3	A novel voltage and frequency controller for a 3-phase 4-wire autonomous wind energy conversion system A novel voltage and frequency controller for a 3-phase 4-wire autonomous wind energy conversion system	Prof. Bhim Singh, DEE
4	Crude Glycerol from Bio-diesel production as a processing aid for industrial explosives	Prof. L. M. Das, CES
5	Block Manifold without construction plugs particularly for low pressure fluids applications	Prof. P. V. M. Rao, DME
6	Design and Development of a system to weave 3-D performs with carbon fibres	Dr. R. Alagirusamy, DTT
7	Force Sensor using a novel functionally graded material	Dr. P. M. Pandey, DME
8	A novel design of pilfer proof, collapsible, secure, light weight currency carrying FRP box	Dr. Naresh Bhatnagar, DME
9	A process for the preparation of Silver Nanogel and Structures thereof	Prof. Bhuvanesh Gupta, DTT
10	A PCM formulation for low supercooling, high stability and low transition temperatures	Prof. A. K. Agarwal, DTT
11	A system medium for production of chemohetrophic plant growth promoting Rhizobacteria	Dr. Vikram Sahai, DBEB
12	A novel Rack & Pinion System design to overcome Aetermann's error	Prof. P. V. M. Rao, DME
13	Biphasic Reaction of CLA and process for implementation in saponification	Prof. A. N. Bhaskarwar, Chemical Engg.
14.	A process for inducting anti-microbial and anti crease property in Textile material and the material thus produced	Dr. Mangla Joshi, Textile Tech. Deptt

FITT Participation

FITT participated in "INNOVATE INDIA," an Exhibition and Conference organized by NRDC during 15- 16 October, 2007 at The Stein Auditorium, India Habitat Centre, Lodhi Road, New Delhi. Over 100 delegates from Industries, Institution & from abroad visited the FITT stall.

FITT participated in "ELCOMP INDIA 2007" at Pragati Maidan, New Delhi, during 12-14 September 2007. FITT stall displayed the Products of TBIU Companies of IIT Delhi, in the area of Electronics.

5th Global Knowledge Millennium Summit

FITT was the knowledge partner of ASSOCHAM during the 5th Global Knowledge Millennium Summit – Nano technology & Biotechnology held from 18-21 September 2007 at New Delhi. Prof. A Ganguly & Dr. Aditya Mittal from IIT Delhi were among the Distinguished Speakers at the Summit.

Lecture

Prof. Martin Heming from Centre for Technology and Innovation Management, Leiden University, Netherlands, delivered a lecture titled "Struggling for early-stage VC funding in India- What entrepreneurs need to know" at IIT Delhi on December 06, 2007. The lecture was organized under the aegis of FITT.

Technology Transfer Agreement

A Technology Transfer Agreement was signed between SICO & FITT, IIT Delhi on November 02, 2007. The Technology Transferred was Antennae Trainer Kit. The Transfer Comprised 2 parts viz., Knowhow transfer agreement & Handing over and taking over of documents/devices as part of the knowhow transfer agreement.

Annual Convocation of IIT Delhi

IIT Delhi celebrated its 38th annual convocation on 11th August 2007 in the Dogra Hall of the Institute. Mr. Montek Singh Ahluwalia, Deputy Chairman, Planning Commission was the Chief Guest. Degrees were awarded to 1381 graduates that included 140 PhDs, 716 post-graduates, 55 MBAs and 470 undergraduates. A large number of awards and medals were given to the meritorious students. Institute also recognized three alumnus with Distinguished alumni awards and two more with Distinguished alumni service awards. These alumni were recognized for bringing laurels to the Institute through their work and for contributing to the cause of development of the Institute. Apart from this, Prof. U.R. Rao was presented with the degree of Honoris Causa for his contribution to science & technology.

Technology Development Projects (June 2007- November 2007)

Sr. No.	Title	PI	Dept	Client
1	Design & Fabrication of five micro-strip patch antennas at 2.45	Prof. S. K. Koul	CARE	Vidyut Yantra Udyog, Meerut
2	Noise and Vibration Measurement and analysis for 80 NB Diaphragm	Dr. G. S. Yadava	ITMMEC	Saxena-Marine Tech(P) Ltd, Noida
3	Development of Pharmaceutical Ingredients/Products of Interest to Martin and Harris Pvt Ltd., New Delhi	Prof. H. M. Chawla	Deptt of Chemistry	ASG Biochem Pvt Ltd., New Delhi
4	Identification of Interesting Video events	Prof. Santanu Chaudhury	Elect. Engg	AOL Online India Pvt Ltd., Bangalore
5	Development of Optimization Techniques for Product Design	Prof. Anoop Chawla	Mech.Engg	Mitsubishi Heavy Industries Ltd., Japan
6	Development of Abrasive Fabrics	Prof. R. Chattopadhyay	Text. Tech	Fore Bros Tools(P) Ltd., Ghaziabad
7	TYROO CLICK FRAUD CONTROLS	Prof. Naveen Garg	CSE	Tyroo Media Pvt Ltd., New Delhi
8	Medium and Fermentation Operation Condition Optimization for Growth of Consortium-micro Organisations for soil reclamation and generation of samples for large	Dr. Vikram Sahai	DBEB	Care-Pro-BioScience (P) Ltd., New Delhi

Training Programmes

Since June 2007, 13 customized HRDd programmes were held under the aegis of FITT. A list of some HRD programmes completed/forthcoming are given below:

HRD Programmes (Concluded)

Sr. No.	Title	Date & Venue	PI/Deptt.	Sponsored/Participation
1	Construction Management for Operational Efficiencies	19th to 21st June, 2007, IITD	Dr. K.N. Jha, Civil Prof. B. Bhattacharjee, Civil	Nagarjuna Construction Company Ltd, Hyderabad
2	Workshop on Advances in Multimedia Processing	18th July –22nd July, 2007, IITD	Prof. Santanu Chaudhury, EED Dr. Brejesh Lall, EED	Participation based
3	Training Programme on "Water Pollution and Waterborne Diseases for CPCB	Aug 30 to Sep 1, 2007, IITD	Dr. A. K. Mittal, Civil Engg.	CPCB, New Delhi
4	Training on "Data Structure & Algorithms	7th to 10th August, 2007, Cadence, Noida	Prof. Naveen Garg, CSE	Sponsored from Cadence, Noida
5	Workshop on Environment Management in Thermal Power Stations	3-5 October, 2007, IITD	Prof. D. K. Sharma, CES	Participation based
6	Short Course on "Computer Graphics"	6-7, October, 2007, Adobe, Noida	Dr. Subodh Kumar, CSE Prof. Prem K Kalra, CSE	Sponsored from Adobe, Noida
7	Training Programme on "GIS & Its Application in Civil Engineering"	Sept. 27 to 1 Dec. 2007, IITD	Prof. A. K. Gosain, Civil	Sponsored from LD College of Engg., Ahmedabad
8	Short course on "Workshop on 'Steam Generation at NTPC Singrauli"	10-12 October, 2007, NTPC Singrauli	Dr. P.M.V. Subbarao, ME	NTPC Singrauli
9	Short course on Analysis, Design and Construction of Structures	21-23 December, 2007, IITD	Dr. S. Bhalla, Civil Engg. Prof. B. Bhatacharjee, Civil Engg.	Participation based
10	International Course on Transportation Planning and Safety: Impact and Biomechanics	10-16 December, 2007, IITD	Dr. Geetam Tiwari, TRIPP Prof. Dinesh Mohan, TRIPP	Sponsored & Participation based
11	Short course on "Diagnostic Maintenance & Machine Condition Monitoring"	10-12 December, 2007, IITD	Dr. Ashish K. Darpe, ME.	Participation based
12	Workshop on "Trends in Image and Video Processing"	December 12-15, 2007, IITD	Dr. Brejesh Lall, EE Dr. Sumantra Dutta Roy, EE	Participation based
13	"Pneumatic Conveying Technology" (Application to Flyash, Cement and Alumina)	January 9-11, 2008, IITD	Prof. V. K. Agarwal, ITMMEC	Participation based

Forthcoming Programmes

1	Certificate Course on Embedded Systems and Applications	7 February to May 7, 2008, IITD	Dr. I. N. Kar, EE Dr. Kolin Paul, CSE	Participation based
2	International Workshop on Advances in Asbestos-free Friction Composites-II (IWAAFC-II)"	7-8, February 2008, IITD	Prof. J. Bijwe, ITMMEC	Participation based
3	Training Programme on "Environmental health Efects for CPCB	12-14, February 2008, IITD	Dr. Girjia Jayaraman, CAS	CPCB, New Delhi
4	Workshop on "CDM, Carbon Management (CO_2 – Sequestration and Storage) and Current Environment Management Issues"	27-28, February 2008, IITD	Prof. D. K. Sharma, CES	Participation based
5	National workshop on Health Monitoring Nano Destructive Evaluation and Rerafitting of Structure	7 & 8 March, 2008, IITD	Dr. Suresh Bhalla, CE Prof. B. Bhattacharjee, CE	Participation based
6	Workshop on Laser Spectroscopy and Nanophotonics	14-15 March, 2008, IITD	Dr. R. K. Soni, Physics	Participation based
7	Training course on Acoustic Survey of Gangetic Dolphins in Brahmaputra River Systems	To be decided	Prof. R. Bahl, CARE	OIL India Ltd.

Foundation for Innovation and Technology Transfer
(A Regd. Society)
Indian Institute of Technology, Delhi, Hauz Khas, New Delhi-110 016
Tel: 26857762 / 26581013 / 26597164 / 26597289 / 26597153
Fax: 91-11-26851169 Website : www.fitt-iitd.org
Compiled by: Mr. Partha Bhattacharya
e-mail: parthab@fitt.iitd.ernet.in