Future Challenges of the Indian Economy and the Role of IT Industry
Deepak Parekh, Chairman, HDFC
Inaugural Address at 45th CSI Annual National Convention, Mumbai
Call for Proposals from CSI Chapters and Members to Host Technology Appreciation Seminars for the year 2010-11

Prelude: The mission of the CSI is to facilitate research, knowledge sharing, learning and career enhancement for its stakeholders, while simultaneously inspiring and nurturing new entrants into the industry and helping them to integrate into the IT community. The CSI is also working closely with other industry associations, government bodies and academia to ensure that the benefits of IT advancement ultimately percolate down to every single citizen of India. In pursuant to the above mission and objectives of the Computer Society of India, it is proposed to host a series of Technology Appreciation Seminars for building/strengthening Knowledge-communities (TASK) for the year 2010-2011. An indicative list of topics for the seminars is appended hereunder:

<table>
<thead>
<tr>
<th>Indicative Topics (but not limited to these)</th>
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<tr>
<td>Green Computing</td>
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<td>Cloud Computing</td>
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<td>Nanotechnology</td>
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<td>Bio-inspired Computing</td>
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<td>Gaming Technologies</td>
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<td>Geo-informatics</td>
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<td>Software Product Line Engineering</td>
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<td>Network Modeling &amp; Simulation</td>
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<td>Business Analytics and Optimization</td>
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<td>Knowledge Management</td>
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<td>Convergent Communication Systems</td>
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<td>IT Infrastructure Management</td>
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<td>Biometrics and Smart Card Systems</td>
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<td>Information and Storage Management Systems</td>
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<td>Indian Language Computing</td>
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<td>Applications Lifecycle Management</td>
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<tr>
<td>Bioinformatics and Systems Biology</td>
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<tr>
<td>Information Security Management</td>
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<td>Agile Software Development Methodologies</td>
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<tr>
<td>Network Programming and Protocols</td>
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<tr>
<td>Database and Enterprise Systems</td>
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<tr>
<td>Grid Computing and its Applications</td>
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<td>Embedded and Real-time Systems</td>
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<td>Electronic Design Automation</td>
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<tr>
<td>Software Reliability Engineering</td>
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<tr>
<td>Cyber Security and Law</td>
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<td>Data Warehousing and Data Mining</td>
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<tr>
<td>Business Process Management</td>
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<tr>
<td>Software Risk Management</td>
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<tr>
<td>Social Networking</td>
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<tr>
<td>Enterprise Network Architecture and Design</td>
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<tr>
<td>Open Source Software</td>
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<tr>
<td>Mobile, Ubiquitous and Pervasive Computing</td>
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<tr>
<td>Internet and Web Technologies</td>
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<tr>
<td>Systems Engineering Methodologies and Tools</td>
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<tr>
<td>Information Systems Auditing</td>
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</tbody>
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The seminars will be conducted by the CSI Chapters in collaboration with CSI Member Institutions. The CSI-HQ and respective RVPs will extend the necessary support in organizing these seminars such as making available a rich pool of distinguished speakers and offering technical support. The CSI Divisional Chairpersons, CSI-SIG Conveners, CSI’s partner Professional Societies and CSI’s Representatives in IFIP TCs will be collaborating in hosting these seminars, wherever necessary. The seminar topics and delivery will be finalized through consultation among the subject matter experts and keeping in view the current needs of the Business, Industry, Government, Academia, Research and Consultancy. The primary focus will be on to address the “skill gaps” among IT professionals/practitioners, end-users, faculty members and students.

Submission Guidelines: The interested CSI chapters and members may submit the complete details or an outline of the proposed seminar (for hosting by the respective chapters/institutions) on or before 31st January 2011 by e-mail to hq@csi-india.org with a copy to vp@csi-india.org.

The proposals should include the following details:
1. Title of seminar
2. Duration of seminar (one day/ half day and number of tracks)
3. The Topics and Outline of Seminar
4. Potential Partners and Sponsors
5. Target audience and size
6. Preliminary Budget (Estimated Expenditure and Expected Revenue)

Due preference will be given to the proposals following collaborative and cooperative approach, especially the models suggested hereunder:

1. The host chapters collaborating with the respective RVPs, Divisional Chairpersons and CSI SIG Coordinators as well as seeking cooperation of nearby chapters and member institutions.
2. The host chapters facilitating and fostering new collaborative/partnership models to organize value added programmes with active support and participation from CSI’s partner professional societies, national/international science & technology organizations, established industry associations, premier institutes and research organizations.

Based on the proposals received and in consultation with the subject matter experts, a final list of the seminars for 2010-11 will be released after due approval of the ExecCom.

Special Note: The organizers of best seminars will be considered for special recognition including awards and rewards by the ExecCom. The best seminars content, reference material and key resource persons of the above seminars will be shared with the host CSI chapters and CSI student branches for conducting similar seminars, workshop and other educational programmes at their locations across India.

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2010-11/12

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(Back Cover)
The earliest origins of green consciousness can be debated at length, but many point to the publication of naturalist Rachel Carson’s *Silent Spring* as the key event which triggered public awareness and the beginning of environmental activism in its present form. *“Silent Spring”* was first serialised in *The New Yorker* in June 1962, and arrived in the bookstores later the same year.

From *Silent Spring* in the 60’s to the current United Nations Millennium Declaration, people and countries have been increasingly encouraged to achieve better management, conservation and sustainable development of all resources provided by nature. Although views may differ, most scientists would attribute a key role to technology in achieving this. ICT, in particular, can provide monitoring facilities, control systems, intelligent construction models and so on. From a scientific point of view we especially welcome input that considers the promise Service-Oriented Architectures hold as an enabler of sophisticated mechanisms that would support a transition to or monitoring of environment-friendly solutions.

Inspired by the need to take adequate actions against humankind’s rapidly destroying the conditions for prosperity and profit, “Green Computing,” has emerged as a multi-disciplinary eco-domain pushing sustainable development through innovative Information and Communication Technology - ICT and related solutions. These innovations are making an impact on the acceleration of the development of truly sustainable (eco-effective) technologies. Such technologies are making advanced IT solutions facilitate activities of great societal relevance.

Today no day passes without coming across a message or two pertaining to “Green Computing”. The ICT professionals have come a long way from defining “Green Computing” as disposing e-waste in a socially responsible and eco-friendly manner.

One of the most popular practices in “Green Computing” in the recent years is to reduce the power consumption of the devices. Good architectures and solutions to balance the processing power and the load conditions in a manner that minimizes the power consumption and heat generated are now readily available for commercial use.

The U.S. Environmental Protection Agency has estimated that data centers accounted for 1.5% of the nation’s electricity consumption in 2006, and it said that figure could double by 2011. Many companies are facing energy problems in their data centers, as powerful modern servers and the shift to doing business online stretches their power and cooling capacities.

“Consolidation” of the Data Centers in terms of the number of servers deployed to support enterprise wide applications is another good practice in the area of “Green Computing”. The challenge of ensuring scalability and reducing the costs has been tough in this approach. The Green Grid Consortium has announced a “top-to-bottom” design guide called “Data Center 2.0” for building energy-efficient data centers, as well as new metrics for estimating data center productivity.

Virtualization is a more comprehensive solution that provides a marix of CPUs and Storage Devices that can be dynamically configured to facilitate enterprise-wide eco-friendly deployment of high-performance ICT based solutions that are cost-effective.

There are many more innovative topics such as, green design, disposal and recycling, regulatory compliance, eco-labeling of IT products, environment-related risk mitigation, green metrics, augmented reality, green IT lessons (experience, case studies), teleworking, green printing, and green power grid.

“Green Computing” enables companies to meet business demands for cost-effective, energy-efficient, flexible, secure & stable solutions while being environmentally responsible.

On behalf of the CSI ExecCom and the CSIC Team, I thank Dr. Deepak Shikarpur, Chairman, CSI SIG on “Green Computing” for provide a carefully chosen set of articles for the theme section of this issue. I think this is indeed a good beginning for the New Year 2011.

The CSIC team wishes all the readers a Very Happy and Prosperous New Year 2011.

Dr. Gopal T V
Hon. Chief Editor
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This book is widely credited with helping launch the environmental movement.

Some Words that Moved a Nation excerpted from “Silent Spring” are:

The history of life on earth has been a history of interaction between living things and their surroundings. To a large extent, the physical form and the habits of the earth’s vegetation and its animal life have been molded by the environment. Considering the whole span of earthly time, the opposite effect, in which life actually modifies its environment. Considering the whole span of earthly time, the opposite effect, in which life actually modifies its environment. Considering the whole span of earthly time, the opposite effect, in which life actually modifies its environment. Considering the whole span of earthly time, the opposite effect, in which life actually modifies its environment. Considering the whole span of earthly time, the opposite effect, in which life actually modifies its environment. Considering the whole span of earthly time, the opposite effect, in which life actually modifies its environment. Considering the whole span of earthly time, the opposite effect, in which life actually modifies its environment.
Dear Affectionate Members of CSI Family,

Happy and Prosperous New Year 2011 to make your life as beautiful as you can imagine. My prayers to the Almighty, for blessing you wonderful joy, in your continuous attempts for extending voluntary services to the family of CSI.

During December 2010, several conferences/events have been organized by CSI in different parts of the country, by promoting High Quality RESEARCH in several areas.

**National Conference of IT for Defence:**
A National Conference IT for Defense was organized by the CSI Special Interest Group on Information Security (SIG-IS) during 2-3 December 2010 along with Defence Research & Development Organization (DRDO) and Bangalore Chapter of CSI, on the theme: “Emerging Technologies in the Modern Battle Field Scenario”.

The event Chair and Chairperson of SIG-IS, Dr.C.R.Chakravarthy deserve our salute for the over all success of the conference. The Event-Chair, Mr. T Sabapathy – Program Chair, Dr. Anirban Basu – Organising Chair, Mr. Vishwas Bondade - Finance Committee Chair and Mr.T.N.Seetharamu - Registration Chair had excelled in making the events successful. We are grateful to DRDO for encouraging this conference with knowledgeable resource persons. We thank DRDO, M/s. Barco and KPMG, VMware, Intel, RITTS, Public Sector Undertakings - M/s. BEL and ECL for their contributions and sponsorship support. The members of the CSI-SIG-IS and Dr. Rama Subramaniam, IFIP-TC-11 chair had contributed for the success of the event. Dr. R Sreehari Rao, Chief Controller of Research & Development (CCR&D) for Electronics and Computer Sciences of DRDO has inaugurated the conference and delivered the key-note address.

This conference has provided the logistics for Computer Society of India to setup research center(s) in the areas of Information Security at academic Institutions. Dr. C R Chakravarthy would lead the SIG-IS with new research centers.

**AP State Students convention**
1st AP State Students convention at Anil Neerukonda Institute of Technology & Sciences (ANITCS) SB, has been organized with the support of Visakhapatnam chapter on the theme: “Techno progression for Renaissance of IT in India” during 10-11 Dec 2010. About 3000 student delegates had attended and about hundred Technical papers were presented apart from the theme sessions. Heartly Congratulations to Prof. K Rajasekhar Rao, AP Students Coordinator, Mr. P Satyanarayana, Prof P S Avadhani and Prof. Suresh Chandra Satapathy, Mr. V Thapovardhan deserves our appreciation and we thank Infosys and Kenya for their support.

**COMAD 2010**
International Conference on Data management (COMAD) has been organized well at Nagpur during December 8-10, 2010. Prof Sudarshan, Prof Sreenivasa Kumar, Prof Srinri Parthasarathy, Mr. C G Saharsrabudhe and Dr. T V Gopal, have put in commendable effort in organizing COMAD. It had attracted good participation due to excellent resource persons. Special thanks are due to Prof. P S Deshpande and Ms. Meera Dhanu of the Visvesvaraya Technological University, Belgaum.

**National Conference on E-Government & E-Society (NCCEGVS-2010)**
Heartly Congratulations to Allahabad Chapter of CSI on successfully planning and organizing a National Conference on E-Government & E-Society (NCCEGVS-2010) in association with CSI, Division-III (Sc. Applications) & CSI SIG on E-Governance during December 11-12, 2010 at Allahabad. We appreciate the efforts, put in by the organizing Chair Mr. D K Divvedi, SIG convener Gen. Dr.R.K.Bagga, CSI conference Chair Mr. M D Agrawal, Division III Chair Prof. S.Subramanian, Managing Committee of CSI Allahabad Chapter lead by Mr. Zafar Aslam and Mr. Anupam Agrawal and their teams for bringing up the event, involving the practitioners of E-Governance.

**International Conference on Signal & Image Processing**
Seventy Four Research Papers which were selected by the International Editorial team, were presented in parallel Sessions with 200 participants attending the International Conference on Signal & Image Processing during 15-16 December 2010 which was organized by RMD Engineering College and CSI student Branch of RMD in association with IEEE. The management headed by Mr. R.S. Muniratnam Naidu, Mr. R.M.Kishore and Mr. Y.Pradeep had encouraged the event while Prof. R M Suresh has excelled in organizing the logistics with the support of Dr. K Sivaram and Dr. K Dharmalingam. The infrastructure and professional participation is so good that Dr. C R Chakravarthy has assessed and accepted the proposal to start a CSI research Centre on Information Security at RMD Engineering College with the Support of the Management of the RMD group of Institutions.

**Workshop on “Frauds and Crimes in the Digital World”**
Dr. Cyril Raj has organized an interesting workshop on “Frauds and Crimes in the Digital World” with the help of Mr. H R Mohan & Prof. Tamlarasai, in Dr. MGR University on 17th December 2010. CSI Student members had an excellent time to listen to about a dozen experts presenting their papers on the theme. We are grateful to Mr. ACS Arun Kumar for his support and encouragement.

**Workshop on “Applied Computer Science”:**
IIIT, Hyderabad Student Branch had organized a work shop on “Applied Computer Science involving experts on Technologies related to languages, Speech, Security, and Image Processing, e-Governance, Data Engineering, Spatial Informatics and related subjects during 18-19 December 2010. It has been a great Knowledge sharing environment created by Dr. R K Bagga, Prof. K S Rajan and Dr. Suryakant with the support of the humble Director of IIIT- Prof. Rajeev Sangal.

**International Conference on Communication and Computational Intelligence**
Kongu College of Engineering (KCE) has been successful in organizing a High Quality Research conference during 27-29 December 2010 in its attractive campus in Perundurai near ERODE in Tamilnadu. CSI-KCE Student Branch had a regional meet of students to get associated with this conference. Original research contributions in the form of 27 research papers, each in the classification under Advanced Networks & Information Security, 28 papers in Communication and Embedded Systems, 15 papers in Computational Intelligence, 13 papers in Advanced Computing and 8 papers in Internet Technologies have been selected by a dedicated International Editorial and Advisory Committee drawn from a dozen counties and were presented in parallel sessions. An attractive proceedings has been published by M/S. SciTech Publications (India) Pvt.Ltd with ISBN: 978-81-8371-369-6.

Dr. Bala Srinivasan from Australia and Dr. A Alphones from Singapore contributed on theme sessions while Dr. K Karunakaran, Vice Chancellor of Anna University, Coimbatore had inaugurated the conference. We congratulate Prof. S Kuppuswami and his dedicated teams of Professionals for their success in organizing such kind of International Research meet in rural surroundings of the college, developed by the Philanthropy of KONGU families. The services provided to all participants by the KVIT trust headed by Mr. M Murugesan, the President of KVIT and his colleagues: Mr. Sathiamoorthy, Mr. Viswanathan, Mr. Muthuswamy, Mr. Phalaniswamy, Mr. Krishnaswami and other SWAMIs, is worth remembering as KONGU Hospitality.

Prof. P Thirumurthy
President, Computer Society of India
Nature Inspired Machine Intelligence

Deepak Shikarpur

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Few concepts in history have spread as rapidly as that of ‘digital divide’, and with it, the conviction that IT can be used to promote development. Is IT only for classes or for all strata’s of society is a popular topic of debate.

Once unknown ideas, ‘IT for the masses’ and ‘bridging the digital divide’ have suddenly leapt to the forefront of consciousness in the world of development. They are the slogans of the season, the mantras of the year. Literally Crores of Rupees are committed to the belief that IT can enable the Have Not’s to ‘leapfrog’ traditional problems of development like poverty, illiteracy, disease, hunger, unemployment, corruption, and social inequalities so as to move rapidly into the modern Information Age.

Information Technology for many years was perceived to be the tool of the urban rich society and hence considered a technology meant for upper strata of the society. This image needs to change. Look at the mobile revolution in India. Now the mobile technology can be an equalizer amongst all sections. Same is the case with Computers. For this to happen affordable and energy efficient computers need to be made available to all. This is where ‘Green Computing” can make wonders.

Innovation lead inclusive growth can provide many social benefits to people from lower strata of the society. If IT has to really become India’s Tomorrow then Affordable, Hasselfree, Energy efficient Computers must be made available to all. Green Computing is a welcome step in that Direction.

Green computing is the environmentally responsible use of computers and related resources. Such practices include the implementation of energy-efficient central processing units (CPUs), servers and peripherals as well as reduced resource consumption and proper disposal of electronic waste (e-waste). In our country where energy is a scarce commodity, we need to promote Green computing.

While environmentally responsible computing includes controlling pollution in the manufacture and disposal of computer equipment, its focus is on energy efficiency, which has implications for controlling operating cost as well as improving the environment. Reports indicate that as much as 30% of corporate operating budgets go to power costs, and the corporate data center is an intense power consumer.

We at Computer Society of India appeal all our readers to become responsible ITzans and create role models in the community you operate. This issue of Green Computing is an effort in that Direction. In addition to this many events on Green IT are planned all over India though various CSI chapters. Please participate in them whole heartedly.

About the Guest Editor

Dr. Deepak Shikarpur is a Technopreneur and Writer with global repute. He is Director of Autalone Design software Limited, Pure IT, SEED Infotech Ltd. and Member of Global Advisory Board of Saama Technologies and Quality Assurance Institute. He is also part of several Higher Education Bodies in the state of Maharashtra. He has written 15 books on IT in marathi and has won several awards for literature constituted by Government of Maharashtra. He has been nominated as a member of Special IT Task force constituted by the Hon Chief Minister of Maharashtra. He is member of Executive Committee of Computer Society of India.

IT Entrepreneur and writer from Pune Dr. Deepak Shikarpur has been declared elected unopposed as the next District Governor of Rotary District 3131. Dr. Shikarpur hails from Rotary Club of Pune Shivajinagar and is member of Rotary for the past 19 years. He is active in the IT industry for the past 25 years and is currently on the board of several IT/BPO companies as well as IT training institutions. He is a member of the IT Task force formed by Hon Chief Minister of Maharashtra. Deepak is a life member of CSI and is currently member of ExecCom in his capacity as Chairman Division 1.

Rotary International is one of the largest International service organizations on the earth with 33,000 clubs in more than 200 countries and over 12.00 Lakhs members. Rotary District 3131 comprises of 84 rotary clubs in Pune, Raigad and Panvel districts. Every year Rotary spends around ₹ 5,000 crores on service projects all over the world. The Polio eradication program of Rotary provided 220 crores vaccine doses to immunized children in more than 153 countries & has spend more than ₹ 4,250 crores up till now.

Dr. Deepak Shikarpur elected as Rotary District Governor (2013-14)
Green IT Innovation: Leads Environment Sustainability

Vilas Nandavadekar

1. Introduction

Scraps created by massive use of IT has increased tremendously. There is no standard policy to degrade and reuse the scarps at present. The scarp material collected by the low poverty people and they don't know how dispose this material. In regards to this, government or authority should provide clear guidelines to scrap collecting agencies, and needs to provide practical training as per the standards set for disposal. Considering this real fact that Information Technology (IT) has an impact on every individual life & their lifestyle, researchers and developers are becoming innovative in developing ideas and knowledge for conducting their own business or managing others work. The usage of IT applications and peripherals are increasing tremendously in daily life. IT has become an integral part of our lives. In this rat race, businesses are not able to manage the future. This winning race has number of side effects on individuals, Environment, Agriculture and Occupational Health. Due to the large amount of usage of IT applications and peripherals, the impact has made significant difference on this planet and now Air, Water, Soil and overall environment are getting polluted. Its Local and Global effects have started. In this scenario, the products coming into the market day by day either in hardware, Networking, Software etc. is adding to the pollution.

The way for disposal of used electronic items, optimum use of energy, satisfaction of customer or end user and the company invested money should get return on investment. While in use and purchasing the product, we should see that the environmental pollution is avoided at all times in the process of Collection, Utilization, Disposal of e-Waste and manufacturing. Finally, while throwing it out after use or again recycle it for reusage. The whole world is paying attention on this issue and preparing policies on disposal of e-waste or electronic scrap items.

This Green IT addresses initiatives and strategies that reduce the environmental footprint of technology and also produce cost savings in energy use. In this article, the author has suggested and discussed few steps to purchase electronic equipments and peripherals. For example; server virtualization allows businesses to reduce the capital cost of hardware, and the operational costs of energy, management and maintenance.

As we know, we have accept this as challenge and few responsibilities need to carry out by all IT Companies in this regards. The responsibilities are shown in table no. 1. These all are the immediate initiatives that should implement to save mankind from environmental pollution.

Table No. 1: Responsibility to save the society and planet

<table>
<thead>
<tr>
<th>Factor</th>
<th>Responsibility to save the society and planet</th>
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<tbody>
<tr>
<td>Carbon emission</td>
<td>Use eco-friendly equipments to reduce carbon emission.</td>
</tr>
<tr>
<td>Infra Risk</td>
<td>The infrastructures which are harmful to the people should be removed</td>
</tr>
<tr>
<td>Work place</td>
<td>Good working environment should be provided to all employees</td>
</tr>
<tr>
<td>Protection</td>
<td>Protect the environment as well as serve purpose</td>
</tr>
<tr>
<td>Plantation</td>
<td>Plant the trees around the company or organisation</td>
</tr>
<tr>
<td>Energy saving</td>
<td>Use low power consumption servers for data centers</td>
</tr>
<tr>
<td>Configuration</td>
<td>Configure monitors, Hard Disk to power down when it is not in use</td>
</tr>
<tr>
<td>Reuse material</td>
<td>Paper usage and xeroxing should reduce</td>
</tr>
<tr>
<td>Virtualization</td>
<td>Implement virtualization technology</td>
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</tbody>
</table>

2. Impact of Information Technology on Human and Environment

The usage of e-Commerce has increased a lot at present like e-Learning, e-Conferencing, e-Services, e-Mails, e-Cash, e-Business, Internet, Mobile Phone, Web Based Training etc. All the
current IT applications and products have impacts on human life and creates serious issues on environment. We have to identify hazards and its risk associated with human and environment concern and also need to adopt the new methods and techniques to assess the impact of IT on different areas of the society. To analyze them and suggest control measures is the prime necessity of every individual and organization.

Advances in information Technology in the workplace had a major impact on human beings due to long time use of computer it may cause eye and spinal cord problems. Some of the common health risks in using computers like Repetitive Strain Injury (RSI), Computer Vision Syndrome (CVS), Carpel Tunnel Syndrome (CTS), Neck–Shoulder Pain (NSP), Low Back Pain (LBP).

3. Innovative Economy and Green IT

The revolution coming is, Innovative economy. We have to find innovative ways to minimize above mentioned impact on Agriculture, Environment and Occupational Health. Now the time has come to think for both Technology and Environment and also natural resources which are non-renewable. For this all the nations are making green movement in all the fields and new IT revolution started in IT field is called as Green IT which means using resources efficiently without any wastage. Green IT has long term benefits. Various Green IT initiatives comes in mainstream like Conservation of Nature, E-Waste reduction, Efficient collection and disposal of old equipment, Hazard identification & reduction in manufacturing, Better recycling, Encouraging people to print out less material, Virtual working, Pollution controls, Resource allocation, Energy efficiency etc.

4. Reducing and Reusing e-Waste

Electronic waste poses an environmental and human threat by different ways as e-waste contains hazardous materials like lead, mercury, cadmium, phosphorus powders, chromium, barium, and black carbon. Reducing and Reusing e-waste is a good option to minimize the impact of information technology on the environment. Recycling infrastructure needs to be designed and developed in order to stop the accumulation of toxic metals in landfills. Basically waste can be classified in different categories and then to decide for reuse or recycle. A big problem in IT field is disposal.

### Table No. 2: Illustrate Local and Global impact of IT on Human Health and Environment

<table>
<thead>
<tr>
<th>Local Effects</th>
<th>Global Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-waste</td>
<td>Global Warming</td>
</tr>
<tr>
<td>Health Risk (Disease)</td>
<td>Climate Change</td>
</tr>
<tr>
<td>Air Pollution</td>
<td>Level of Ocean raising</td>
</tr>
<tr>
<td>Water Pollution</td>
<td>Temperature Increase</td>
</tr>
<tr>
<td>Land Pollution</td>
<td>Ice Cap to Shrink</td>
</tr>
</tbody>
</table>

Fig. no. 1 indicates serious issues faced by all over the world

<table>
<thead>
<tr>
<th>Human Risk</th>
<th>Air Pollution</th>
<th>Water Pollution</th>
<th>Land Pollution</th>
<th>Environment Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Human Risk" /></td>
<td><img src="image2" alt="Air Pollution" /></td>
<td><img src="image3" alt="Water Pollution" /></td>
<td><img src="image4" alt="Land Pollution" /></td>
<td><img src="image5" alt="Environment Risk" /></td>
</tr>
</tbody>
</table>

Fig. no. 2 indicates different types of waste created by human being on this planet.

<table>
<thead>
<tr>
<th>Plastic Bottles</th>
<th>Cables</th>
<th>Floppies</th>
<th>SMPS</th>
<th>CRT’s</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image6" alt="Plastic Bottles" /></td>
<td><img src="image7" alt="Cables" /></td>
<td><img src="image8" alt="Floppies" /></td>
<td><img src="image9" alt="SMPS" /></td>
<td><img src="image10" alt="CRT’s" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Logic Boards</th>
<th>Monitors</th>
<th>Used Tyres</th>
<th>HSS Scrap</th>
<th>Packaging mtrl.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image11" alt="Logic Boards" /></td>
<td><img src="image12" alt="Monitors" /></td>
<td><img src="image13" alt="Used Tyres" /></td>
<td><img src="image14" alt="HSS Scrap" /></td>
<td><img src="image15" alt="Packaging mtrl." /></td>
</tr>
</tbody>
</table>
of e-waste or electronic scrap items. Every year, it is increasing and creating pollution on this earth.

To design equipment disposal policy and procedure for which can provides guidelines for less cabling could be used to reduce the amount of e-waste production, reduce unnecessary printing of papers, and Xerox copies. All type of plastic and fiber packaging, obsolete computers, printers and electronic peripherals are not dumped and recycled properly which can cause e-waste problem. Monitoring level of e-waste creation, Buying IT equipment that contains lower levels of hazardous waste and recycling design

5. Policy and Management Analysis of e-Waste

There are practical issues with e-waste management like exponential growth of cities, land availability and lack of awareness. The Policy and procedure for recycling and refurbishing are established with strategic guidelines as electronic scrap has been collected and inspected for the equipment, to determine if it has any remaining value in the resale market but repairs or upgrades are made before its resold. If so, the item is refurbished. If the item cannot be sold because it is unrepairable, obsolete, unusable or resale value is completely wiped out or for any other reasons, then items are sorted by category wise as:

- **Organic Waste** - waste substance produced by a living organism containing carbon compounds, mainly the nitrogen, phosphorous and potassium elements that are non-biodegradable. Fig. No. 3 indicates Canteen, Poultry, Food Processing, Animal Droppings, Fruit and Flowers, banana peels, egg shells, corn cobs, apple cores are the waste.
- **Inorganic Waste** - inorganic waste is “garbage” that cannot decompose and it has no carbon. Inorganic waste are highly biodegradable because it has no carbon in it. Fig. no. 4 indicates Wood, Paper, Plastics, optical fibre, wood, metal, furniture, glass, synthetic products are waste.
- **Electronic Waste** - e-Waste is the term used to describe old, end-of-life, obsolete or discarded electronic equipments. E-Waste contains both valuable materials as well as hazardous materials which require special handling and recycling methods. e.g. Floppies, Cables, Power Supply units, Monitors, Logic Board, Keyboards, PC’s, Mobiles etc. pictures are shown in point No. 4.

This category wise distribution of equipments are sent to industrial material recyclers who process the various materials into marketable end-products. Such collection of electrical and electronic equipments allows for more efficient recycling keeping valuable e-waste components in the economy and safely disposes of its harmful components in order to prevent risks to human health and the environment. Therefore innovative recycling technologies at the different steps of the recycling chain can generate genuinely sustainable products. E-waste recycling can be used to create sustainable businesses in developing countries as there is a need to manage hazardous materials while salvaging valuable materials. Better management of e-waste can result in benefits for developing countries, including job creation, improved local knowledge of technology and environmental benefits.

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**Editor’s Choice:**

**How to Do Green Computing**

1. Purchase recycled printer paper.
2. Turn off your computer, printer and other accessories when they’re not in use, to conserve energy.
3. Try not to print documents when it’s not necessary.
4. Donate equipment that you’ve outgrown (but is still in good shape) to nonprofit organizations in your community.
<table>
<thead>
<tr>
<th>Waste Categories</th>
<th>Type of waste</th>
<th>Impact on</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Human</td>
</tr>
<tr>
<td></td>
<td>Floppies</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Cables</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Power Supply units</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Monitors</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Logic Board</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Keyboards</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>PC’s</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Canteen Waste</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Poultry Waste</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Food Processing Waste</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Animal Droppings</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Fruit &amp; Flower</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sewage Sludge</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Paper waste</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Plastic material</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Wood waste</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Metal waste</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Discarded Furniture</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

**Impact Analysis**

Graph No. 1: Impact of various types of wastes on environment on this planet
Human beings must now turn to seek better resources of energy instead of embracing the conventional fuels. Public awareness campaigns must be started to inform people that their minor negligence and excessive electricity utilization is making this planet barren for the future generation. We still have time to control the trouble, but after few years we would not even have a chance to help ourselves out. Most electronic items contain substances that are necessary for their proper operation, including lead, mercury, cadmium and brominated flame-retardants. As a result, disposal of such electronics must be carefully managed.

6. Need of Environment Sustainable IT Architecture

Currently, IT is facing demands for environment sustainable IT Architecture. Unfortunately, the ecological crisis has alarmed us to use advanced technology which has minimal effect on the environment. It is the duty of everyone to protect the world from global warming. We need to design procedures and practices in place for Green Design and Green Disposal. Also re-start nature conservation movement for appropriate utilization of available IT equipments, natural resources and protection of the same i.e. to protect material resources, plant, animal, agriculture and environment. In this, many initiatives should start on immediate basis as –

- Design Energy efficient IT equipments
- Design IT equipment that contains lower levels of hazardous e-waste and recycling design. Don’t design short life products. Suggest to all manufacturing industries to plant more trees around the organisation because one tree provides enough oxygen for two people.

This conservation ethic is sometimes expressed by the Seven R’s:

1. Recycle - Recycling of Ink Cartridges
2. Refurbishing - Refurbishing of used peripherals
3. Reuse - Upgrade Old Computer with new peripherals
4. Reduce - Power Consumption and Energy
5. Return On Investment –ROI based on Advancement of Technology
6. Risk Migration –Environmental, Health and Safety
7. Regulatory Compliance- E-Governance on green IT Front, Statutory requirements. Identify energy conservation strategies and practices. Look at products that offer eco-friendly or reduce packaging. To develop products that fulfills consumer needs for affordable pricing and performance while having minimal impact on environment.

Thus Innovative Green IT addresses environmentally sustainable IT products which moves towards Green Society and Economy. Green IT initiatives that help IT organizations reduce their company’s environmental impact by putting policies and practices in place that make IT infrastructure and operations more energy efficient and environmental sustainable.

7. Green Revolution - Tangible and Intangible Benefits

This initiatives and strategies not only benefits organization, government or environment but is beneficial to all. Some of the tangible and intangible benefits are listed in below table No. 4.

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**Graph No. 2:** This graphical analysis clearly indicates that electronic waste has severe impact on Human and Environment.

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**Editor’s Choice:**

Cut down the length of time a screen saver image appears on the monitor to a minute or less. If the image appears longer than 5 minutes, you’re wasting energy.
Table No. 4: Showing various tangible and intangible benefits of Green IT revolution

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Tangible Benefits</th>
<th>Intangible Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capital Improvements</td>
<td>Environmental Benefits (Pollution Controls)</td>
</tr>
<tr>
<td>2</td>
<td>Maintenance Savings</td>
<td>Economic benefits (Eco-Sustainable Development)</td>
</tr>
<tr>
<td>3</td>
<td>Better &amp; Safer Lighting</td>
<td>Social Benefits</td>
</tr>
<tr>
<td>4</td>
<td>E-Waste Reduction</td>
<td>Secured Temperature/heat disbursement issues Controlled</td>
</tr>
<tr>
<td>5</td>
<td>Energy Efficiency/Saving</td>
<td>Increased User Efficiency</td>
</tr>
<tr>
<td>6</td>
<td>Space Saving</td>
<td>Simple &amp; Reliable IT Infrastructure</td>
</tr>
<tr>
<td>7</td>
<td>Technological Advancement</td>
<td>Testing Application Software on multiple platforms is easy</td>
</tr>
<tr>
<td>8</td>
<td>Travel Reduction (Remote Conferencing &amp; Collaboration)</td>
<td>Emotional risk minimizing</td>
</tr>
<tr>
<td>9</td>
<td>Utilize Resources more efficiently</td>
<td>Behavioral risk minimizing</td>
</tr>
</tbody>
</table>

8. Conclusions

We have to ensure that Natural Resources are conserved and are available for our next generation to continue a way of life that is environment friendly. Design new creative framework useful for Collection, Utilization, Disposal of E-Waste. The strategy and plan for moving Data, System, Transactions, Services, People and Communication requires process and behavior change which can produce an effective green result.

To reduce the pressure on environment International Standards like ISO-14000 and Occupational Health and Safety Standard (OHSAS-18001) on environment management are already designed which needs to be implemented properly. These standards provide a framework and direction for accessing the IT related risk, nature of that risk and required control of measures should follow in day to day usage of all types of electronic devices. These are the good practices for implementation of Green IT initiatives. Everyone should become Green IT Innovator for cultural change and saving mankind from environmental pollution. Scraps created by massive use of IT has increased tremendously. There is no standard policy to degrade and reuse the scraps at present. The scrap material collected by scavengers should be disposed properly. In this regards, government should provide strong guidelines to collecting agencies and if required practical training for disposal as per regulations, so as to maintain Green Revolution in future.

Congratulations!

Prof. (Dr.) A K Nayak, The former chairman (Data Security) and Member Nomination Committee of Computer Society of India shall delivered the most prestigious Platinum Jubilee lecture in the information and communication science & technology (including computer science) section of 98 Indian Science Congress to be held at SRM University, Chennai from 3-7 January 2011. Prof. Nayak a noted scientist and academician in Computer Science and Information Technology and presently Director of Indian Institute of Business Management, Patna has been honoured by many National and International awards, authored / edited several book and technical papers. His has been associated in the academic activities of various Universities of the country as well as worked as an export member and convener of various committees of different statutory bodies.

The Green Grid is a global consortium dedicated to advancing energy efficiency in data centers and business computing ecosystems. It was founded in February 2007 by several key companies in the industry - AMD, APC, Dell, HP, IBM, Intel, Microsoft, Rackable Systems, SprayCool, Sun Microsystems and VMware. The Green Grid has since grown to hundreds of members, including end users and government organizations, all focused on improving data center efficiency.

Mother Nature & Dwindling Natural Resources

Ever since the existence of earth, mankind has been dependent on natural resources for survival and never felt real need for conserving them. As life progressed, mankind invented new means of survival and the next natural step that followed was that of growth - socio-economic growth. As the society grew the needs grew, creating newer industries fueling manifold increase in the consumption of natural resources. Such is the abundance of natural resources that even after billions of years we still continue to enjoy them. But the question is how long can this continue? Are we going to leave anything behind for our future generations?

It is only in the recent past that the world has started realizing the limitations of natural resources and things like global warming, that is severely damaging the geo-economic activities. Looking at the seriousness, worldwide industries have identified actions aimed at controlling this damage.

Globalization & Impact of Information Technology (IT) on the Environment

In this era of globalization and flat world, organizations have managed to thrive and grow, throwing away the limitations of social, economic & cultural boundaries. Technological advancements in Information Technology (IT) are often credited for this growth. Future technological advancements are aimed at leveraging the global skills for producing some of the best results in every sphere of life, making IT an inseparable component of our personal & professional life. The very global nature of today’s businesses is resulting into larger IT facilities. Their demand, including PC’s & server space is growing exponentially.

Most of us are very familiar with the social media tools like, Facebook, Twitter, Blogs and LinkedIn that have changed the way we interact socially. Similarly, the advent of mobile technology has reached even to grass root levels, where it has found place in our day-to-day activities like banking or even agriculture. Technologies like internet, wireless broadband, virtualization and 3G/4G have become significant part of the corporate world.

While IT, also mentioned as Information & Communications Technology (ICT) sometimes, is credited for making life easier and making exponential growth possible, the darker side of this is the adverse impact it leaves on the environment by producing enormous amount of electronic waste. It is therefore time for everyone to wake up to this challenge and start utilizing resources judiciously and managing businesses in a more environment friendly manner.

This is leading the world towards high-tech consumerism. A glance through some of the findings by the United Nations Environmental Program (UNEP) is really shocking.

- Global e-waste generation is growing annually at 40 million tonnes
- US is the unchallenged leader, with China as distant second
- Developing economies like China & India are catching up fast
- China will overtake the US by 2020, as principal e-waste producer
- Next 10 years, India’s e-waste (notably cell phones), is likely to grow by 18 times

In addition to this, there are numerous hazardous chemicals that are used in various electronic devices, like – Mercury, Beryllium, Lead, Brominated Flame Retardant & Hexavalent Chromium, to name a few. These chemicals are toxic in nature and pose severe risks to humans & the environment.

Even though IT is credited for bringing in operational efficiencies, the IT Equipment in-efficiency figures mentioned below are startling. There is tremendous room for improvement in utilizing the IT equipment efficiently and in a more environmental friendly manner.

- Computers & Monitors
  - 50% of desktop power is wasted
  - 90% of PCs have energy saving option disabled
■ Data Centers
   - Average capacity utilization is 12%-15% in working hours
   - 33%-40% power used is wasted
   - Cooling costs are very high
■ Printer
   - Wastes more energy than PCs
   - Most of the printers are not used in duplex printing mode
   - Power management settings are often not enabled

Understanding Green IT
We have seen above how IT has become an integral part of our personal & professional life, so let us understand the definition of Green IT.

■ Green IT which is also called Green Computing, means using IT with minimal impact on environment or environmentally sustainable IT. A more formal definition is - Practices followed during manufacture, usage and recycling or disposal of any IT related device, systems, or processes aimed at minimizing or completely removing damage to the environment.

Every product that we use goes through the lifecycle of manufacture-usage-disposal. This means practically all products that we use leave some impact on the environment during their lifecycle.

Green IT - Key Components
In order to control the IT emission it is important to understand the areas that need to be tackled. Based on the usage and product life cycle the components of Green IT can be broadly classified as,
■ User Interfaces
■ Server Environment
■ Product Lifecycle

IT Emission Sources
IT industry, once considered to be non-polluting industry, contributes close to 3-4% of the global greenhouse gas (GHG) emissions and is likely to grow to 6% by 2020.

If one has to breakdown the IT emission sources, then the picture that emerges out is quite shocking. Unlike popular belief, it is the PC & Monitors that contribute maximum and not servers. The adjacent diagram gives details about the various emission sources within IT. This means PC users have a greater responsibility in using IT sensibly.

Measuring the Emission
Now that we know that every product we use leaves some impact on the environment during its lifecycle, the question is how to measure their emission? It is measured as Carbon Footprint.

A carbon footprint is the total set of greenhouse gas (GHG) emissions caused by organization, event, product or a person. There are six major gases that contribute to the Greenhouse Gas (GHG) effect. They are CO₂, N₂O, CH₄, HFCs, PFCs & SF. For simplicity of reporting, the carbon footprint is expressed in terms of the amount of carbon dioxide or its equivalent of other GHGs emitted (CO₂ equivalent tonnes per annum).

This method is used to calculate the emission during usage and is often divided into two parts - Primary Footprint & Secondary Footprint.

Primary Footprint
Direct Emissions
Emissions by burning fossil fuels

Secondary Footprint
Indirect emissions
Emission from manufacturing
Emission from transport
Emission from packaging

Emission is measured as estimates based on National Average Emission, Industry Standard Sampling at Source or through Live Monitoring.

Not Falling Prey to Green Washing Claims
Green washing is misrepresentation or over representation of product and/or companies being environmental friendly.

In order to score a point over competition or gain undue mileage, certain companies come up with claims / campaigns that are projected as green but they could probably be mere eye wash. As a responsible citizen it is our duty to be little cautious and not fall prey to such claims. Following table provides things that you should look for when you see some of the green washing claims.

What You Should Look For...

When You See Claims Like This...
Biodegradable
Recycled Content
Recyclable
Refillable
Less Packaging

Mention about reasonable time for normal disposal
Clear mention about how much of the product is made from recycled content
Proper method for collection, separation/recovery from solid waste & facility to actually recycle
Availability of collection program for refilling or consumer should be able to refill it on its own
Clear & relevant qualification for comparison. Some times comparison is done with non-existing, phased out product.

If such claims are not properly qualified as mentioned above, then that is a clear case of Green Washing.
Green IT practices by following simple rule also play an important role in implementing as enabler. Finding innovative ways to effectively use IT business lies in making IT green and also identifying goals is what is needed to succeed. Practices but a planned initiative with clear essential steps in embracing green IT environment.

A formal green IT strategy is one of the essential steps in embracing green IT practices but a planned initiative with clear identified goals is what is needed to succeed. Following simple steps can help organizations adopting Green IT practices:

- Setting up Organizational Sustainability Goals
- Identify GHG emission sources
- Baseline your organization to see where it stands on GHG emission
- Create Green IT Strategy
  - Set out clearly achievable targets
  - Look out for low hanging fruits, typically involves least OR no investment
  - Identify areas for long benefits – may need investments
  - Identify areas where IT can be used as an enabler
- Adopting GHG accounting model
- Put in place GHG emission measurement plan on an on-going basis
- There are commercially available software products that can double up as GHG emission measurement & accounting tools
- Implement Green IT plan
- Be Carbon Neutral – Once your organization is able to reduce GHG emission levels to certain minimum levels, it can implement measures like CDM project that can offset remaining minimal emissions, making your organization Carbon Neutral

The future for every sustainable business lies in making IT green and also finding innovative ways to effectively use IT as enabler.

Apart from organization, individuals can also play an important role in implementing Green IT practices by following simple rules of Reduce, Re-use and Recycle.

- Switch off from wall
- Switch off your PC & Monitor at the end of day
- Adjust power management settings
- Remove screen savers – they consume same amount of power
- Upgrade only what is needed
- While buying new equipment, buy only energy efficient equipment – Some IT equipments / brands carry Energy Star or EPEAT ratings

**Green IT Benefits**

Being environment friendly is not only good for the overall geo-economic condition but it can straightway add to your bottom-line. Some of the benefits of adopting Green IT practices are mentioned below.

- There are no negatives of adopting Green IT practice, therefore no regrets
- Significant gains can be achieved with little efforts
- Green IT results in better utilization of IT Infrastructure
- Some of the big direct savings that Green IT can deliver are, Direct savings through reduction in energy consumption Reduced physical IT infrastructure & space Reduced Total Cost of Ownership Reduced IT manpower cost

Based on McKinsey estimates, innovative use of IT can result in 15% reduction in GHG emissions from other parts of the business. In addition to this, through CDM (Clean Development Mechanism) programs, organizations can earn money by trading their carbon credits in the international market.

**Green IT Adoption Challenges**

Like most other organization-wide initiatives, the biggest challenge in adopting Green IT practices is cultural change. In order for such initiative to succeed, what is needed is a comprehensive approach that simultaneously addresses Technology, Process & People related issues. Some of the typical challenges are mentioned below.

- Needs a major cultural shift, across the organization
- Effectiveness depends on behavioral changes
- Leveraging existing IT infrastructure and investments
- Lower priority for capital needed to achieve long term benefits
- Lack of uniform legal framework

**Global GHG Emission During 2009**

According to the Netherlands Environmental Assessment Agency report, Global GHG emission has remained stable for the year 2009.

GHG emission has fallen by 7% for industrialized nations but this fall has been compensated by the developing countries like China (increase by 8%) and India (increase by 6%).

Even with these higher year-on-year growth rates, the per person emission levels for China (6 tonnes) & India (1.4 tonnes) are still lower than the nations like Netherlands (10 tonnes) and US (17 tonnes).

**Tackling Climate Change & Green IT - India Perspective**

Internationally, The United Nations Framework Convention on Climate Change (UNFCCC), which came into force in 1994, established the first intergovernmental framework aiming to tackle climate change. This treaty ensures that member states work collaboratively in order to develop initiatives that not only reduce negative impacts associated with climate change, but also build capacity to cope with effects of increasing temperatures. The Kyoto Protocol, enforced in 2005, enshrined this commitment in legislation and presented legally binding targets which imposed requirements for ratified member states to reduce green house gas (GHG) emissions.

![Graph showing CO2 emissions per capital for different countries](image-url)
behind in taking concrete initiatives in the to include them while implementing these contribute least to the climate change, are specifically poor communities in India, who India is more vulnerable to the climate effective implementation is still a concern. initiativies being taken by the India taken a number of initiatives including, stated objective, the Indian government has clean technologies. In order to achieve the in reducing the emission level but also help voluntary and is not legally binding on us. However, in long run this will not only help in getting foreign investment in the area of clean technologies. In order to achieve the stated objective, the Indian government has taken a number of initiatives including,
- Setting up an expert group on Low Carbon Strategy for Inclusive Growth. This Group has been mandated to develop India’s roadmap for low carbon development. Recommendations from this group will become a central part of India’s Twelfth Five Year Plan which will come into effect in 2012
- A “Carbon Tax” on Coal to Fund Clean Energy • Announcing a levy – a clean energy cess – on coal, at the rate of Rs. 50 (~USD 1) per ton, applicable to both domestically produced and imported coal. This cess is expected to earn around $500 M for the year 2010-11 and will be used for projects in clean energy technology.
- Release of India’s national GHG inventory 2007. Between 1994 and 2007 there is a reduction of 30%. These are the first official numbers published after 1994. The numbers are less than fourth for US and China. It is good to know about so many initiatives being taken by the India government in tackling climate change but effective implementation is still a concern. India is more vulnerable to the climate change than the United States and China. Specifically poor communities in India, who contribute least to the climate change, are the most affected ones. There need to be a sense of urgency with proper perspective to include them while implementing these initiatives.

The Indian industry bodies are also not behind in taking concrete initiatives in the area of Green Business. The Confederation of Indian Industries (CII) Sohrabji Godrej Green Business Center (CII-Godrej GBC) has outlined initiatives like “Mission on Sustainable Growth (MSG)”. As a part of this mission, CII Code for Ecologically Sustainable Business Growth has been developed. This program aims to involve top management of companies seeking voluntary commitments to reduce resource consumption & emission intensity.

Looking at the profit proposition of GHG inventory, CII has come up with Corporate GHG Inventory Program, which lays down guidelines for comprehensive corporate GHG accounting, reporting & management.

NASSCOM, India’s premier trade body and chamber of commerce for IT-BPO industry, has also started its “Green IT” initiative. NASSCOM has partnered with TERI-Business Council for a new initiative called, “Corporate Action Plan on Climate Change: ICT as a Game Changer”. This initiative aims to identify the sectors where ICT can play a game-changing role in carbon emission reduction thereby significantly contributing towards India’s action on climate change.

Since 2000, India has been effectively using Special Economic Zones (SEZ) as engine for economic growth. This has attracted large flow of foreign and domestic investments. So far about 144 SEZs are operation across India and many more are about to come. The Ministry of Commerce and Industry is therefore, developing guidelines for establishment of ‘Green SEZs’. All new and existing SEZs are supposed to implement these guidelines and go for green certification.

Green IT Benchmarking

While everyone is aware and believes that Green IT is important; so far very little has been translated into action. Recently, Fujitsu Australia published a report on “Green IT: Global Benchmark”. This paper is the first ever multi-country benchmark to determine the maturity of Green IT practices and technologies in end user organizations. The report is based on responses from over 630 CIOs and senior IT managers across four countries – US, UK, Australia and India.

The overall maturity level across industries in all the four countries is 56.4 (out of 100). There is relative lack of maturity of Green IT policies, practices and technologies – across industries in all these countries.

India’s overall Green IT maturity index across all industries is 52. Amongst the key industries the Green IT readiness is found to be highest in IT-Communication-Media, followed by Manufacturing and Financial Business Services.

E-Waste Recycling

Electronic Waste (E-waste) comprises of waste electronic goods which are not fit for their originally intended use. Some of the examples could be computers, printers, cell phones, TVs, computer batteries and personal stereos etc. E-waste contains toxic substances and chemicals, likely have adverse effect on the environment and health.

While all efforts are on to improve the operational efficiency of IT equipments and prolong their lifecycle, e-waste is inevitable as the equipment needs its end of life. In India e-waste management is primarily managed through un-organized sector, in unhealthy conditions. The laborers used are often from poor economic background. Coupled with this, E-Waste management in India faces challenges like difficulty in inventorization, poor awareness and lack of legislation.

In the recent past, things have started changing. Now there are proper E-waste recyclers available in India. As of Sep2010, there are as many as 23 recyclers / processors registered under the Ministry of Environment & Forest (MOEF) & Central Pollution Control Board (CPCB), having environmentally sound management practices & the number is growing rapidly. With this facility one can locate E-waste recycler near you, if not next door.

India’s E-Waste guide, which serves as information resource, has been developed as a part of initiative through Indo-German-Swiss partnership. These partners are working in close collaboration with manufacturers, users, recyclers, and NGOs to develop a sustainable E-waste management system in India.

CDM Program

As per the central feature of the Kyoto Protocol, countries are required to limit or reduce their greenhouse gas emissions by 2012. By setting such targets, emission reduction has taken economic value. CDM is a mechanism that helps in monetizing the emission reduction.

CDM stands for “Clean Development Mechanism”. The CDM allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO2. These CERs can be traded and sold, and used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol.

In India the Central Government has constituted the National Clean Development Mechanism (CDM) Authority for the purpose of protecting and improving the quality of environment. The authority receives projects for evaluation and
The report are given below.

- Smart Builds - Smart Buildings that consume less energy could abate 270-360 MMT of CO₂ and save $40-50 billion
- Travel Substitutes - Travel Substitution through virtual meetings and flexible work arrangements could reduce CO₂ by 70-130 MMT and save $20-40 billion

Green IT - Business Potential

As adoption of Green IT practice increases across the globe, it is expected to create new business opportunities, and millions of new jobs driving the future green economy. Some of the potential business opportunities are listed below.

- Manufacturing
  - Process Automation
  - New battery technology
  - Optical quantum computer
  - New LCD/LED screens
- Transportation
  - Dematerialization – eCommerce, Videoconferencing, Tele-working
  - Eco driving – Fuel efficient Vehicles, Hybrid Technology
  - Eco friendly packaging
- Usage / Consumption
  - GHG emission management systems - Measure, Monitor, CDM (Clean Development Mechanism) / CDP (Carbon Disclosure Project –UK), Carbon trading
  - Smart Grids - improved efficiencies in power generation, transmission & distribution
  - Electronic Waste Management & Renewable Energy Sources
- Facility Management
  - Green Buildings
  - Virtualization, Cloud Computing (SaaS, IaaS & PaaS)
  - Blade Servers
  - Multifunction Printers
  - Power management software

Conclusion

Green IT is a very vast subject extending far beyond data centers and IT departments, therefore needing urgent comprehensive actions. Going by the current level of industry preparedness and lack of uniform government regulations, there is far more urgency that needs to be demonstrated. Failing this the true potential of IT as an enabler in reducing the global emission levels significantly by 2020 can not be achieved. Everyone, including governments, industries and individuals need to bring in significant changes in their policy making & implementation, business models and behaviors, respectively.

There are a few organizations worldwide which have taken up the role of spreading the awareness and providing assistance in adopting Green IT practices. This will assist in realizing the true potential of Green IT.

Large organizations have already adopted Green IT practices and have started reaping benefits through direct savings and achieving their corporate sustainability goals by reducing GHG emissions. It is time for everyone to take steps in adopting Green IT practices, if not already done, because Green IT is going to be the main stay for the future green economy.

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- Silicon Valley Toxics Coalition (SVTC)
- SMART 2020
- Special Economic Zone (SEZ) India
- Ministry of Commerce & Industry, Department of Commerce
- United Nations Environmental Program (UNEP)
- United Nations Framework Convention on Climate Change (UNFCCC)

About the Author

Mr. Onkar Kendhe is the Co-founder & Managing Partner at NextStra Consulting LLP, a management consulting firm. He is an alumnus of College of Engineering Pune (COEP) with over 20 years of global experience in Manufacturing Engineering, R&D and Information Technology consulting. He is among the first 25 BCS ISEB certified professionals in India and is instrumental in starting pioneering “Green IT Consulting” practice at NextStra. He has extensively worked across India, US, Europe & APAC. He can be reached at onkar.k@nextstra.com.
The whole universe is made up Panch-Tatwa ("the five great elements of nature") namely: Earth, Water, Fire, Air and Space. Climate change is directly related to changes happening to panchtatva.

Climate change is not the new thing, in fact because of the different seasons our life is colourful. The unexpected way in which the changes happening in the overall season cycle and the impact it has on survival of the human race is the key concern.

The relationship between carbon emission and economics has resulted into the major actions across the polluting industry. But carbon emission is directly related to just one of the item of panchtatva ‘AIR’, which has multifold impact on climate patterns. The real concern due to climate change will get addressed when the transactional relationship issues between consumer (Customer reference here compose of individuals and business units) actions and all the parameters of panchtatva get addressed.

Currently change agents such as ‘consumers’ are directly/indirectly involved in activities, which will disturb the balance of the ecosystem. The first essential step required as stakeholders is to realize the need for change (in terms of our choices, design, investment etc). This change will reduce the threats arising due to climate change issues.

The topic ‘Climate change’ is huge, but unless the holistic view and relationship of our activities/actions are not correlated, the rigor and commitment toward this cause will not evolve and ultimately we all will not be able to make our planet a better and safe place to live.

This article will establish the context and present holistic view on following topics and also discuss ‘green IT and IT for green’ in brief and the challenges it has and road ahead.

**What is Green, Greening means, Evolution of green, Environmental issue, Role of corporate and public, Green IT, Role of IT in greening.**

**What is green?**
Products/Services that,
- Are more environmentally friendly relative to other products in the same category
- Have lesser / reduced impact on human health and environment than other product that perform similar function

**Greening Means...**
Commitment to environmentally, socially sensitive design and operations responsive to the evolving principles of sustainability across the life cycle of products and services offered encompassing local, regional and global scales in partnership with the key stakeholders.

In short, climate change is superset and ‘green’ initiatives/programs/business are the focused approach by different organization and/or group of people.

So greening means different thing to different people, organizations, depending upon the work
domain, geographical conditions, business opportunities etc, but let’s start consolidating the thoughts on each area and use each one of learning to make a big difference. Ultimately everybody’s contribution will get map to the one of the panchatvata item shown in Fig. 1.

Let’s understand the evolution of the environmental issue within span of last 50 years, this will help to understand the intensity of this issue, they way it is spreading and urgency of actions from all stakeholders.

**Evolution of Environmental issues** (Ref: Politics of the environment by Carter Neil)

- **1st Generation:**
  - Preservation and conservation (Pre1960) Protection of wildlife and habitats, Solid erosion, Local pollution
- **2nd Generation from 1960 onwards**
  - Population growth, Technology, Pesticides, Resource depletion, Pollution abatement, Desertification
- **3rd generation: Global issues (late 1970’s onward)**
  - Climate Change, Ozone depletion, Rainforest destruction, Genetically modified organism, Loss of biodiversity

Looking at this evolution, it looks environmental issues is getting complex, huge, multidisciplinary and calls for actions from each one of us. Providing complex answer to complex problem will complicate the issue further and result in inactions.

**Environmental issue: Can we make it simple?**

- **Characteristic of environmental issue**
  - Complex, Global, Urgent Address Needed, Consensus Issues, Huge Investment needed
  - Desirable Characteristic of solution
  - Urban and Rural areas would require a different approach towards approaching and implementing the solution.

Though this task is difficult, its effort often gets compounded due to the high cost of the technology required to resolve the issue. Sometimes the technology is available at right price but it is under testing and might involve methods which might be classified as unconventional. Often connecting with the right people may help you in better understanding of the issues, for example we are connecting via this article which may lead to solution and/or understanding of few issues.

Below is an example which will portray the manner in which the above thought process can be shown to be relevant.

**Corporate - Employees CS work model** (Corporate need to align their social responsibility with the resources they are using/impacting)

- Quarterly E-waste Drive for employees
- Repeatable (Associates will get money for their e-waste and satisfaction)
- Minimum time and efforts (E-waste Vendor will take care of maximum arrangement)
- Adaptable (Anybody may copy this program in his/her office)
- Environmental Advantage (E-waste is handled in professional Manner)

Such example is means to sensitize the responsible citizen of today and to those who would form a part of the future coming generation.

In general, aligning with domain literature and feedback received from the industry delegates from technical meets and several conferences the following trends are observed and practiced in the industry:

1. Reduce the operational cost
2. Be compliance with the regulation
3. Urge to become green (Product and processes complementing to the environment sustainability).

The shift in this order of priority will happen as the awareness and regulation scenario changes. The changing cost and maturity of technology and solutions will be a driving factor towards organizational outlook.

**Example:** Few years before green buildings were just good to know theoretical concepts and now such green buildings are increasingly becoming a reality and are being implemented due to following driving factors,

- Establishment of standards (Such as LEED)
- Suppliers are available
- ROI period is decreased

Just a few years ago there were major roadblocks towards adoption as standards were taking shape, suppliers were not available and ROI (Return on Investment) was not acceptable.

Examples: Philips was aware of the CFL technology since as early as the year of 1980, but was not able to push the CFL branded product due to market dynamics and low support from the end consumer. This was also due to low awareness and non realization of benefits.

There are people in rural area who still stick to traditional thick tube lights instead of the thinner ones that are more energy efficient. Common perception that a thicker tube light emits more light compared to thinner ones is inhibiting the change in consumer behavior; this is again can be viewed as an issue of decreased awareness.

**Role of IT and Climate change:** IT has become integral part of everybody life. The broad category of IT role in greening can be as follow:

- Greening the IT infrastructure ‘Green IT’
- Using IT as enabler for greening ‘IT For Green’

**Green IT:**

Green IT mostly the focus on the IT infrastructure (servers, cooling data centers, thin clients, virtualization) are targeted. This area got major attention due to the potential of the problem and the solutions to this issue driven by IT equipment manufacturing companies. Now green IT area as business opportunity has become more or less saturated for the new entrants, this has been validated by various analysts in their reports.

Time has come to enhance the scope of the green IT, change the focus and look for operations where large electrical/ electronics equipments are consolidated at one location and having need for cooling and/or power optimization. Slowly the ‘Green Infrastructure’ scope will evolve.

Telecom Central offices are like IT data center which fits into the concept of ‘Green Infrastructure’.

Telecommunication central office cooling issue depends on geographies. In Canada the cooling of the telecom office may not be energy intensive, since the outside temperature for most of the year it remain around 24degcel or below. So telecom central office located in Middle East or Asian countries may be an issue.

The energy in traditional data center is roughly having 40 -60 % percent sharing between the cooling requirement and the actual utilization of the energy. Also one need to concentrate from the overall process of cooling, it will be observed that lot of low quality heat present in the hot exhaust of the HVAC unit is getting released in atmosphere, which infact can be used for some other activities (For e.g. hot air for dryers)

**IT for Green:** Applies information technology to improving the sustainability of company operations and society at large. Again, two elements define this category of opportunity: 1) business process and applications — supply chain, building automation, telework, and other business operations outside of IT, and 2) public infrastructure — capturing information technology’s role in creating efficiant
transportation systems, smart electric grids, and entire green communities built from scratch. [Ref 2]

Below is the list of opportunity in ‘IT for Green’ space, light blue color blocks represents the opportunities mapped to public policy and infrastructure. While light purple color blocks represent the opportunities in the business process and strategy.

The skill to match the business opportunities and the market readiness is the critical success factor in tapping green business opportunity. This business acumen is needed in green domain, since the opportunities are huge but few are market ready and launch need to be synchronized depend of the market demand.

The IT will simply, optimize and make to overall execution of the process efficient. The ultimate change will come in the consumer domain when we have real ‘Green Design’ in place. Currently the green design is evolving phase due to the following challenges [Ref 3]:

- Availability of Guidelines, checklists and Software based DFE (Design for environment Tools)
- Issues and Challenges in Developing Green Design tools
- The need for green product realization
- External factors affecting green design.

Green Design topic itself is a big area and will need separated paper/article to understand each items listed above. I have quoted these for the completeness of this article.

To achieve sustainable impact toward the climate change issues, corporate need to have strategy and actions on the three items ‘Green IT, IT for Green and Green Design’ simultaneously with varied intensity depending upon their business activities.

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**A REPORT**

**Placing CSI in the North East Map**

*Report Prepared by: Dipti Prasad Mukherjee, Regional Vice President, Region II*

Recently a workshop on Computational Information Processing was held on November 10-12, 2010 in the Government Zirtiri Residential Science College, Aizawl, Mizoram organized by the Indian Statistical Institute. One of the important events as a part of the workshop was to showcase CSI and its different activities in front of audiences from the north eastern states of India. This session of showcasing CSI was organized by Professor Dipti Prasad Mukherjee, Regional Vice President of CSI for the east and north eastern states. The lead speaker in the session was Mr. Zohmachhuana Khawlhring (Chhuantea), senior member of CSI from Aizawl. Mr. Khawlhring explained the advantage of getting connected with the peers in the field of IT and he stressed to use CSI as an important vehicle for this purpose. The session was very interactive and ended with the proposal from the head of the Computer Science department of Zirtiri Residential Science College, Aizawl to conduct a bigger CSI awareness workshop for the students.
Sakal Media Group – Green IT Project

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Sakal Media Group – Green IT Project

Sakal Media Group has initially implemented the “Green IT” project in our organization last two years. We are upgrade and enhance systems and processes time to time by application of the latest technology. We are using laptops rather than desktops, using TFT monitors rather than CRT monitors, exercising rationale in using printing devices - being print cautious, printing both sides of the paper, using multi function devices, using power management tools effectively.

Approaches to Green Computing

Virtualization

Sakal Group has implemented virtualization for SAP setup which reduces the number hardware and power consumption. We are using Xtenda last 3 years and multiple users are sharing single desktop. Using blade servers to optimize resources. Working on server virtualization. Computer virtualization refers to the abstraction of computer resources, such as the process of running two or more logical computer systems on one set of physical hardware. With virtualization, a system administrator could combine several physical systems into virtual machines on one single, powerful system, thereby unplugging the original hardware and reducing power and cooling consumption. Virtualization can assist in distributing work so that servers are either busy, or put in a low power sleep state.

Power Management

By deploying Active Directory group policy “Sakal Media Group” has deployed a power management to reduce the power consumption. In 2006 we implement Modular UPS. As transformer less efficiency is higher resulting in power wastage.
prevention. Rectifier and Thyristor section is IGBT base providing almost Unity power factor results in about 96% efficiency (Conventional UPS had .8 unity PF) Current Harmonics level is less than 5% (Conventional 30 to 40 %) So less heat dissipations. Thus UPS provide true GREEN power. Through active directory we had implemented Power management for all desktops resulting in power saving. Converted 1000 plus desktops from CRT to TFT over the period of 5 years.

Storage
Sakal Group has setup all its ERP and Prepress Production setup on a common storage which reduced the effective power consumption. As hard drive prices have fallen, storage farms have tended to increase in capacity to make more data available online. This includes archival and backup data that would formerly have been saved on tape or other offline storage. The increase in online storage has increased power consumption. Reducing the power consumed by large storage arrays, while still providing the benefits of online storage.

Telecommuting
- Digital Connect
- Reduction in Cost Overheads
- Improved Work Efficiency
- Time Optimization
- Multimedia Functionalities
- Business Friendly
- Centralized Equipments Control
- Less Cooling Requirements
- Space Saving with Smaller Foot Prints
- Better Resource Utilization

Sakal Group has started its Video conferencing setup in 2005 that reduced a lot of cost in Traveling of people across the units for meeting. Voice over IP (VoIP) reduces the telephony wiring infrastructure by sharing the existing Ethernet copper. VoIP and phone extension mobility also made hot desking more practical. Teleconferencing and telepresence technologies are often implemented in green computing initiatives. The advantages are many; increased worker satisfaction, reduction of greenhouse gas emissions related to travel, and increased profit margins as a result of lower overhead costs for office space, heat, lighting, etc. The savings are significant. Other related initiatives, such as hoteling, reduce the square footage per employee as workers reserve space only when they need it. Many types of jobs, such as sales, consulting, and field service, integrate well with this technique.

Materials Recycling
We rewind faulty paper rolls and use it in GOA unit. We save paper wastage and in turn we save trees and support for Go green movement. We sell the paper waste to scrap vendors and the vendors to Paper mill to recycle the papers waste. Computer systems that have outlived their particular function can be re-purposed, or donated to various charities and non-profit organizations.

Benefits of Green IT

<table>
<thead>
<tr>
<th>Area of Implementation</th>
<th>Solution and Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop</td>
<td>Power savings of 25% by deploying policies for standby and shutdown</td>
</tr>
<tr>
<td>High-end Monitors</td>
<td>Power savings of 40% by deploying low power LCDs for 19 and 21 - inch Monitors</td>
</tr>
</tbody>
</table>
| Network                | - Optimised LAN segments
                      | - Intelligent network with EitherNET Power
                      | - Off when not in use.
                      | - WAN links utilisation enhanced by 40% |
| Servers                | - Consolidated and virtualised;reduced 16 servers
                      | - Blades with virtualisation
                      | - utilisation and efficiency enhanced by 22%
                      | - Created virtualised systems for operational savings upto 15% |
| Storage                | - Consolidation and optimization; Resulted in 18
                      | - TB extra storage
                      | - 28% storage freed by compression and de-duplication
                      | - Evaluated Solid State Drive (SSD). For coming New application |
| Data Center            | - Reduced power and cooling expenses by 22%
                      | - Overall computing performance improved by 22% |
| Printers               | - Prints reduced by 60-70% |

Sakal Group a heading towards Green IT goal that will be achieved by continuous efforts to make Sakal Group 100% Green in upcoming years.
Inaugural address at CSI 45th Annual National Convention

Future Challenges of the Indian Economy and the Role of the IT Industry

Deepak Parekh

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Good evening Ladies and Gentlemen

It may be odd and perhaps obvious to state that given my non-technical background, I may have never had the opportunity to be here as a participant and yet I have the honour of addressing India’s oldest and largest association of IT professionals. Thank you for inviting me. It is indeed my pleasure to be here today.

Technology is no longer a choice or an option - it is a compulsion and a way of life. The current generation shaping the future have perhaps not known life without the internet or a smart phone. What is amazing though is that the new generation takes to technology like a duck to water – it is part of their DNA. Given India’s demographic tilt towards a young population, with 60% of its people being under the age of 30 years, India stands at a natural advantage since it is the young generation that is the savviest of the tech savvy generation. Evidently, ICT is the new order of the world.

Three years after the start of the economic crisis, global recovery continues to remain fragile and imbalanced. China, India and a small handful of emerging economies are the growth champions while US, Japan and Euro areas remain sluggish, undermining global recovery. The recent hoopla on the so-called “currency wars, trade frictions and rising protectionism” is more of an outcome of the politicisation of the global crisis. There is of course, no denying that there are acute global imbalances - China with its reluctance to revalue its currency, US swamping the world with its debt and devaluing currency and Europe’s fiscal problems. The key policy challenge for advanced economies is to shift from public to private sector led growth. Emerging economies on the other hand need to stimulate domestic demand rather than rely on exports for growth.

There are other structural problems with the developed economies. So acute has been the problem of unemployment that it is now popularly referred to as the ‘ugly monthly statistic’. With unemployment rates running at close to 10% in the US and some EU countries, economic recovery is likely to remain elusive for some time to come. The problem with a workforce that is unemployed for a long period is that there is a de-skilling of labour and this, further damages the prospects of long-term growth.

Against this global backdrop, India stands on a strong footing with an estimated GDP growth rate of 8.5 to 9% for FY 2011. This growth has been on the back of an above normal monsoon, good industrial growth and a robust services sector that continues to be the bedrock of the Indian economy. Investor confidence in India has never been better. This year so far, foreign institutional investors have pumped in close to US$ 40 billion compared to less than half this amount last year.

While India appears to be in a position of strength, it is important not to get too carried away...
with this new-found optimism. India faces many challenges, which if not addressed could thwart the country’s growth potential over the long run. In many ways, India is still a bullock-cart economy.

In 2005, in my capacity as a member of the Investment Commission, we had several interactions with Intel who wanted to set up an Assembly and Test facility for semi-conductors in India. The investment they were talking about was not large – approximately US$ 1 billion, but they assured us that their investment would create a 10 time multiplier effect as other ancillary investments would follow. This would have meant the creation of thousands of skilled jobs in high tech manufacturing and export revenues for India. But Intel was a tough bargainer. At that time, India had not even got its act together on its semi-conductor manufacturing policy. If I recall correctly, Intel asked for 100 acres of free land, a 15 year tax holiday, guaranteed power at a concessional rate of 50% and an upfront cash subsidy. The upfront subsidy was what created an impasse between Intel and the Indian government. While there are admittedly two sides to the argument, the point we need to note is that there are many emerging countries that are readily willing to offer these subsidies. Needless to say, this potential investment slipped out of our hands and went to Vietnam, despite the country not having quality labour skills that India has. My key regret was that the government was unable to sit across the table and negotiate other alternate options.

India has amply demonstrated its prowess in the software sector, but has not been able to replicate this success on the hardware side. This is becoming all the more significant since countries like China and Taiwan that are strong players on the hardware side and is preferable to FII money which often tends to be short-term and skittish.

One cannot talk about technology enabled infrastructure – be it power, roads, airports or telecom. By the end of this financial year, infrastructure investment is expected to touch 8% of GDP, up from 4.4% in FY 2003. In the 12th Five Year Plan, spanning the period 2012 to 2017, it is estimated that a total of US $1 trillion of infrastructure investments are needed, of which close to half is estimated to come from the private sector. Much still needs to be done in the infrastructure sector. One cannot talk about technology enabled financial inclusion as long as the peak power deficit remains at 13% and where many villages still lack electrification. I do not think I need to talk to this audience about India’s creaky infrastructure. Instead let me take this opportunity to focus on the huge opportunity that smart technology can play in the infrastructure sector.

Just like the internet wave that took off in the 1990s, smart infrastructure is fast becoming the new technological leap. Smart infrastructure entails a more environmentally friendly and efficient system of managing and monitoring various infrastructure – be it roads, electric grids, water pipes, food supply chains etc. through the use of wireless sensors and software analytics. Smart infrastructure is being hailed as an era where computers integrate with the physical world. For instance, smart infrastructure uses sensors and electronic devices that could be built into a bridge to monitor the quality of concrete for any weaknesses or structural damage. So the sensors keep track of any maintenance work required. Smart infrastructure may also stop the endless digging since underground infrastructure like pipes, cables or grids can be monitored through sensors. While the western world is looking to re-build their aging infrastructure using smart infrastructure, for India it may well be the opportunity to leapfrog technology.

The third crucial issue where I see IT playing a key role is education. India has the second largest pool of skilled labour. Each year, India produces 2 million graduates, 650,000 engineers and over 9,000 PhDs. While these numbers may be impressive, the worrying issue is that over two-thirds of the graduates are not readily employable and need to be re-skilled and re-trained before they can enter the job market. It is here that initiatives such as e-learning and on-line vocational training can help fill the void. It is estimated that the e-learning market will grow to Rs. 11 billion by 2012 from the current Rs. 1.5 billion.

India’s public spend on education at 3% of GDP still remains woefully low though the government is committed to doubling it to 6% of GDP. The number of students that drop off the education ladder is alarming. India has a gross enrolment ratio of only 12% compared to 82% in the US. If India needs to fulfill its goal of a 30% gross enrolment ratio by 2020, India would need an estimated 800 more universities and over 35,000 colleges. IT can play a big role through e-education. The quality of education will see a huge leap when lectures in say Harvard are electronically beamed to a classroom in Hastinapur – and the technology for this is readily available.

The fourth aspect where IT can catapult the Indian economy is in terms of managing and improving public information infrastructure. Aadhaar is one such commendable initiative of connecting over one billion people. Much still needs to be done on digitisation of land records, which would lead to clearer land titles, reduced disputes and increased transparency. While a few states have initiated computerised land records, most still lag behind. Similarly, there is a need to create a national information utility for judicial cases.
fear or unease is spreading fast. Trust to a culture of suspicion? A sense of day. Are we now moving from a culture of to a nation, the corporate sector and even New risks keep emerging. The risk exposure concerns. The risk posture has increased. to recognise that the growing use of network bridging the government and its citizens will therefore be key in improving the overall governance framework.

The fifth aspect is e-governance. The faster the government gets its e-governance initiative going, the better. This is imperative to stem the rot of corruption. An on-line system in which citizens have to request for all government services on-line through the internet may perhaps be the best way to reduce bureaucracy and force government processes to be more hassle-free. Once citizens have access to information on what decisions are being made by the government, where their money is being spent and who it is being spent on, automatically the quality of public services will improve. A strong IT network bridging the government and its citizens will therefore be key in improving the overall governance framework.

However, while reaping the benefits of technology, it is equally important to recognise that the growing use of technology brings with it a host of security concerns. The risk posture has increased. New risks keep emerging. The risk exposure to a nation, the corporate sector and even people like you and me is increasing day by day. Are we now moving from a culture of trust to a culture of suspicion? A sense of fear or unease is spreading fast.

If we think for a moment, we recognise that the risks are now much more due to:
- Unstable and hostile neighbours;
- Cross border and global terrorism;
- Rise of organised crime;
- Fierce global competition; and
- Global economic uncertainties.

Today, risks to a corporate and a nation are from unknown sources and the impact is often beyond one’s imagination. Let me site a few examples:
(a) Today, it is possible for a new breed of cyber terrorists to break into a plane’s sophisticated computer system and force it to crash without even boarding the plane.
(b) In 2007, attacks on national websites in Estonia caused a huge problem on the country’s infrastructure, leading the incident to be described as the ‘first war in cyberspace’.
(c) Critical infrastructure, such as nuclear power stations or electric supplies can be targets of cyber terrorism.
(d) Companies today are losing more through electronic theft of data than from physical stealing of assets.
(e) Cyber attacks against Google’s operation in China earlier this year highlights China’s history of malicious computer activities.
(f) Nearly 15% of the world’s internet traffic, including data from the US Department of Defence and other government and commercial websites were briefly redirected through networks in China this year. It is alleged that China Telecom hijacked massive volumes of internet traffic during this 18 minute incident that occurred on April 18, 2010. These incidents demonstrate inherent vulnerabilities in the internet architecture.

Information security initiatives are at a nascent stage and user awareness is low. Even in establishments that have taken initiatives in this area, the focus is often on merely adding technology controls. Most organisations do not have a holistic approach to integrating critical aspects like detection, containment, processes and people in their security initiatives.

To conclude, technology induction brings along with it a plethora of risks which can be easily exploited by people across the globe, resulting in business losses and even disrupting economies. The only solution to address this problem is to move away from the classical way of risk assessment, where we tend to look at issues in a standalone manner. We now need to look at risks from even the remotest of possibilities and design mitigation measures by integrating processes, people and technology rather than just deploying more technology controls. Often, people are the weakest link in a security infrastructure. Educating users on security awareness is a great way to build a security conscious environment. Security is a pervasive, ongoing process of reviewing and revising processes, based on changes in the environment. If we are not ready to do this, we will lose more than we earn - whether it is our brand, reputation or money.

This apart, the Indian IT industry today stands at the cusp of some significant changes. Whether the US$ 10 laptop will see the light of day may be debatable, but clearly affordable innovation will be the driving force. The catapulting of the Indian economy and the IT industry is inevitable and there is sufficient reason to believe that India’s best times are still to come.

Thank you.

About the Speaker

Deepak Parekh is the Chairman of Housing Development Finance Corporation, India’s leading housing finance company. A pioneer in mortgage finance, he has enabled scores of Indian middle class people to own their houses or apartments through affordable loans. He is based in Mumbai.

A Chartered Accountant, Deepak Parekh began his career with Ernst & Young Management Consultancy Services in New York. After returning to India, he worked with Grindlays Bank and also Chase Manhattan Bank as its assistant representative for South Asia. Parekh joined HDFC in 1978. He was promoted to Managing Director in 1985 and appointed as Chairman in 1993. He was instrumental in making the HDFC one of India’s premier housing finance institutions. Parekh also became the Non-Executive Chairman of Infrastructure Development Finance Company Ltd (IDFC), a Government of India enterprise for infrastructure projects in 1997.

Deepak Parekh has won several awards including Businessman of the Year 1996 from Business India and the JRD Tata Corporate Leadership Award by All India Management Association (AIMA). He was the first recipient of the Qimpro Platinum Award for his contributions to the services sector, and the youngest recipient of the prestigious Corporate Award for Life Time Achievement by the Economic Times. Padma Bhushan was conferred on him by the Government of India. In 2010 he was the first international recipient of The Institute of Chartered Accountants in England and Wales’ Outstanding Achievement Award, for his contribution over many years to the finance and accountancy profession. Excerpted from: http://en.wikipedia.org/wiki/Deepak_Parekh
CSI-45th Annual Convention 2010 at Mumbai
iGen Technologies for the next decade

Report prepared by Jayshree A Dhere, Resident Editor

Late in the evening of 27th November 2010, the big bonanza of CSI-2010 at Mumbai came to an end with satisfaction writ large on the many faces of delegates and participants of having witnessed a gorgeous event, which turned out to be a genuine feast of knowledge for one and all.

For the new generation, which is exemplified with the use of iDevices such as iPads, iPods and so on, CSI-2010, annual national convention of CSI, with theme aptly named as ‘iGen – Technologies for the next decade...’ was planned to prepare everyone with the ever-expanding penetration of Information and Communication Technologies into our day-to-day lives. The iGen event not only kept up its promise, but turned out to be an extremely educative event organized on a very grand scale, which stands unparalleled. It once again proved the unique strength of CSI in organizing events of this stature and bringing together intelligentsia from a variety of sections of society on a common platform for deliberations.

The event generated huge amount of educative content, creating a unique dilemma for editors of CSI communications as to how to cover the whole of it in one go and let it reach to the many readers of the CSI Communications and to those, who could not attend the event in person. So, we planned to cover the content of the convention in phases. In December 2010 issue, we brought to you, the inspiring speech of the chief guest Mr. Gopalakrishnan, which ended on an optimistic note, along with abstracts from various educative tracks. In this issue, we are covering the contents of two of the four pre-convention workshops as well as the speech of the guest of honour Mr. Deepak Parekh, Chairman, HDFC Ltd.

Following four workshops were conducted in parallel on 25th November 2010 before the Annual Convention 2010 was formally inaugurated.

- Setting up of a cloud computing facility
- Android and Web Technologies
- Predictive Business - The Business Imperative
- 3G/4G - The Emerging Trends

Here is a brief of the first two workshops-
Virtualization is basically pooling and sharing of resources in order that the IT supply meets business demand. It helps reduce IT costs and risk, speed delivery of new applications and business services, and increase focus on business priorities. Virtualization technique allows a large physical server to be partitioned ‘logically’ into multiple smaller servers. These can be combined into a single large server, in future, if required. It is possible to achieve 50 – 100% increase in utilization by using virtualization technique.

Today virtualization can be applied to each and every layer of IT infrastructure such as Server, Storage, Fabric (Network and SAN) and Clients/ Desktops and thereby it enables to optimise IT infrastructure, which has direct relevance to business value and hence, virtualization carries strategic importance. The workshop further threw light on specific HP offerings such as HP Integrity server providing partitioning advantages. HP offerings are all integrated and compliment each other for better flexibility.

The workshop provided a formal definition of cloud computing - “Cloud computing is a style of computing where a scalable and elastic IT-enabled capabilities are delivered as a service to external customers using Internet technologies.” (Source: Gartner). Advantages are mobility due to Internet, reduction in time to market and conversion of capital expenditure into operational expenditure. It is estimated that by 2012, 20% businesses will own no IT assets due to adoption of cloud computing.

Adoption of this style of computing is bringing about a fundamental change in role of IT organization, as its focus shifts from maintaining technologies and applications to sourcing, delivering and governing services for better results. Thus, IT organization can now focus on providing services that are core to business operations and success. In the cloud, everything is a service and services are global-class and multi-tenant by design. Multi-tenancy aspect was very well explained by elaborating the concepts such as more than one [user, application or both] on a shared, common platform.

The workshop also elaborated various cloud types such as External/Public clouds, Internal/ Private clouds, Community cloud & Hybrid cloud, and delivery models such as SaaS, IaaS and PaaS). Key features and specific concerns of each type of cloud were discussed. Concerns of different service delivery models based on different types of cloud services such as Software Services (SaaS), Infrastructure Services (IaaS) and Platform Services (PaaS)m were also explained in detail.

Measuring of benefits with cloud adoption was explained during the workshop. It is possible to measure decrease in provisioning time, increase in service re-use, increase in utilization and in uptime/hour, decrease in dedicated operational support, increase in business value per effort hour and per watt consumed and also decrease in % of IT budget dedicated to maintenance. Thus, the workshop provided insight into how business benefits of adopting cloud can be computed.

It was explained how cloud is creating a new challenge for CIOs to become a builder and broker of IT services and bridge the legacy and cloud worlds. In traditional IT, as the IT scale increases, investments also increase quite rapidly. With adoption of virtualization and automation, the steep increase can be reduced to some extent but the real benefits can be achieved only by adopting cloud services in a strategic manner. The critical success factor for cloud service providers lies in achieving scale at a right cost.

HP cloud functional reference architecture was explained during the workshop as a part of HP cloud offerings. HP Converged Infrastructure (CI) is an HP offering with the delivery model of IaaS. HP Blade System Matrix provides IaaS solution as private cloud. Other offerings such as HP Cloud Service Automation for Matrix and HP CloudStart solution were also explained.

The Android operating system software stack consists of Java applications running on a Java based object oriented application framework on top of Java core libraries running on a Dalvik virtual machine featuring JIT compilation.

Principal Adroid features are –
- Application framework enabling reuse and replacement of components
- Dalvik virtual machine optimized for mobile devices
- Integrated browser based on the open source WebKit engine
- Optimized graphics powered by a custom 2D graphics library; 3D graphics based on the OpenGL ES 1.0 specification (hardware acceleration optional)
- SQLite for structured data storage
- Media support for common audio, video, and still image formats (JPEG, GIF)
- GSM Telephony (hardware dependent)
- Bluetooth, EDGE, 3G, and WiFi (hardware dependent)
Camera, GPS, compass, and accelerometer (hardware dependent) and

Rich development environment including a device emulator, tools for debugging, memory and performance profiling, and a plug-in for the Eclipse IDE.

Latest version of Android is 2.2 (Froyo) on 20 May 2010, which is based on Linux Kernel 2.6.32. Future upcoming versions are 2.3 (Gingerbread) Based on Linux Kernel 2.6.33 or .34 and then 3.0 (Honeycomb).

The workshop also provided guidance on developing applications for Android platform using Android SDK -

The Android SDK (software development kit) has the tools, sample code, and docs, you need to create great apps. Android Market is an open service that lets you distribute your apps to handsets. Android Open Source Project gives you access to the entire platform source. The Android Open Source Project gives you the tools, sample code, and tutorials. Currently supported development platforms include x86-architecture computers running Linux (any modern desktop Linux distribution), MacOS X 10.4.9 or later, Windows XP or Vista. Requirements also include Java Development Kit, Apache Ant, and Python 2.2 or later.

The workshop threw light on Android Architecture -

Android ships with a set of core applications including an email client, SMS program, calendar, maps, browser, contacts, and others. All applications are written using the Java programming language. By providing an open development platform, Android offers developers the ability to build extremely rich and innovative applications. Developers are free to take advantage of the device hardware, access location information, run background services, set alarms, add notifications to the status bar, and much, much more.

Developers have full access to the same framework APIs used by the core applications. The application architecture is designed to simplify the reuse of components; any application can publish its capabilities and any other application may then make use of those capabilities (subject to security constraints enforced by the framework). This same mechanism allows components to be replaced by the user.

The workshop provided details of a set of services and systems underlying all applications and Android Runtime. Android includes a set of core libraries that provides most of the functionality available in the core libraries of the Java programming language. Every Android application runs in its own process, with its own instance of the Dalvik virtual machine. Dalvik has been written so that a device can run multiple VMs efficiently. The Dalvik VM executes files in the Dalvik Executable (.dex) format, which is optimized for minimal memory footprint. The VM is register-based, and runs classes compiled by a Java language compiler that have been transformed into the .dex format by the included “dx” tool.

The Dalvik VM relies on the Linux kernel for underlying functionality such as threading and low-level memory management. Android relies on Linux version 2.6 for core system services such as security, memory management, process management, network stack, and driver model. The kernel also acts as an abstraction layer between the hardware and the rest of the software stack.

The typical steps in Application Development are -

- Create an AVD (Android virtual device) using the Android AVD manager in Eclipse.
- Specify the Android version and the API level.
- After launching the AVD, Android emulator is launched.

The workshop ended with discussion about some of the successful Android case studies (applications) such as Billboard, WOW, Knight Tour, My Vault, BeGone (game), A-Me-Go, and OpenSocial.

CSI Nihilent e-Governance Awards 2009-2010

CSI Nihilent e-Governance Awards 2009-2010 ceremony was one of the main events at the 45th Annual Convention of Computer Society of India (CSI-2010) held at Mumbai in Hotel Taj Lands End held on 26 Nov 2010. This special session was chaired by Prof. P Thirumurthy, President, CSI with the renowned Dr. Vijay Bhatkar, Chairman e-Governance Committee, Maharashtra as the Chief Guest. Apart from Conveners of this years Awards, Mr. Piyush Gupta, NSIG and Dr. G P Sahu, MNNIT, Maj. Gen. (Dr) R K Bagga, Chairman, CSI SIGeGOV participated in distribution of award trophies as well as certificates.

Mr/S Nihilent was represented by their Vice President, Mr. Ravi Teja, who addressed the audience and assured continued support to future awards.

The following important dignitaries including Hon’ble Minister of Revenue from Goa, Mr. Philip Jose D’Souza and Mr. Ravi S Saxena, IAS Additional Chief Secretary State of Gujarat were presented CSI Nihilent e-Governance Awards of Excellence for the year 2009-2010 in a well-attended Session.

As per the CSI SIGeGov practice of documenting all the major e-Governance initiatives in India, a special book ‘Enablers of Change: Selected e-Governance Initiatives in India’, published by ICFAI University Press was released by Mr. Philip Jose D’Souza, Hon’ble Revenue Minister of Goa. The book has been edited by Mr. Piyush Gupta, R K Bagga and Ayaluri Sridevi and is updated up to 16 Nov 2010. The book is the 5th in the series released by CSI SIGeGov and contains the nominations for Projects, Departments and Districts, evaluated by this year Selection Committee, comprising of eminent specialists in the area of e-Governance including MP Gupta, Mahesh Chandra, Ashok Agarwal, Harish P Iyer, Piyush Gupta, Ayaluri Sridevi, Lalit Sawhney, Surendra Kapoor, Nityesh Bhat, LC Singh, Ravi Teja and ML Saikumar. In addition, the book also contains learnings from Impact Assessment, Government transformation and assessment methodology written by experts including Dr Subhash Bhatnagar, IIIM, Ahmedabad, Dr G P Sahu MNNIT Allahabad and J C Kapoor, IIPA, New Delhi.

Mr. Surendra Kapoor (Ex-Executive Director CMC Ltd.) and member of the CSI Nihilent e-Governance Selection Committee proposed vote of thanks and accepted to be the Convenor of these Awards for next year 2010-2011. The Awards ceremony was followed by a special Dinner for Awarders along with the participants of CSI2010 Annual Convention.

K S Vijaya Sekhar, Secretariat, CSI SIGeGov
The annual national convention of Computer Society of India is a premier forum for the presentation of new advances, experiences and research results in the field of Computer Science and Applications. The convention brings together the leading researchers, technocrats, government officials, CIO/COO/CEO/CTOs, engineers and scientists in the domain across the world. The 46th Annual National Convention, CSI-2011 will be hosted at Ahmedabad in Gujarat a Vibrant State of the country in continuation of the Golden Jubilee year of the state celebrations, i.e. Swarnim Gujarat during 1st to 3rd December, 2011. The theme of the convention will be “ICT 4 U: Touching the Lives of Everyone”, and it is expected to have more than 800 participants across India and other nations.

Major Attractions of CSI 2011

Pre-Convention International Workshops

CSI invites proposals for organizing one or more pre-convention International Workshops on different areas of computer science and applications in conjunction with CSI 2011. Topics of the interest include (but are not limited to): Algorithms, AI, Computer Modeling, Networks & Security, Simulation, Expert Systems, HPC, Parallel and Distributed Computing, Cloud, Mobile Computing, NLP, Security, Software Engineering & CASE, E-Learning etc.

Special Invited Talks/Sessions

Proposals are invited for Special Invited Talks/Sessions either from individual expert or from groups. Proposals for the same must include a title, rationale, contact information, bio-data of the speaker, and an abstract. CSI may also consider having special invited sessions in case, there is an outstanding number of proposals.

Pre-Convention Tutorials

Proposals are invited for pre-convention tutorials focusing on advanced topics in ICT. A proposal for the tutorial should include title, outline, expected enrolment, and presenter/organizer’s biography. Inquiries regarding the tutorials should be addressed to Programme Chair.

Experience Sharing Sessions

Proposals from individuals, corporate houses, industries, government, research organizations, etc are invited to share their unique experiences in ICT during the convention. Experiences could possibly be a challenge, an issue, an application, a unique implementation, a research (not a research paper), an achievement, etc.

Panel Discussions

Proposals are invited for panel discussions on the subjects of mass interest. Panel discussions will not be limited to brief speeches by experts. They will be organised to have focused discussions among experts and the audience.

Send Proposals on or before 22-Feb-2011.

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Executive Summary: Information and communication technology have brought about a revolution in the way people interact and communicate with one another. This has transformed peoples’ lives and changed the way businesses are managed. When the way individuals work and enjoy their free time changes, it changes the cultural mores of the society. The ICT revolution has been a key factor for facilitating globalization and a large expansion of business and industry. Yet ICT is perceived to have created a digital divide, and is said to have adversely affected the process of inclusion and co-option of the poor. This paper aims at exploring ways in which computing can be made more humane, thereby opening up opportunities for enablement, empowerment, inclusive growth, empathy, equality and development that have often been ignored, but need to be utilized for evolving a better future for humanity.

Background: The ICT revolution has transformed the whole world, brought it closer and has improved speed, effectiveness and efficiency of communication beyond imagination. ICT revolution has changed our lives, the way we work, we do business, we interact socially, our recreation and even our culture. The process of computerization and the advent of the ICT revolution is something which is here to stay and has become a part of our lives.

Need for Humane Computing: The adoption and use of computers and information technologies has affected human lives, behaviour and activities in many ways. It has improved productivity and helped make available information widely to every one, who is computer literate. But it has also de-humanized us by making human inter-actions and human-machine inter-actions rule-based and free of all emotional intelligence. A number of human characteristics and features are markedly missing in the current ICT processes of inter-action.

Conscience: Computers process information and data using built in rational logic, and hence do not have a conscience, which is a very human quality.

Equality and Social Justice: The field of ICT and computing requires people to be technology savvy, to have the required infrastructure, and wherewithal / means for access and use of computers. This is not within the means of the common masses. They thus create an entry barrier keeping out a large section of the people who cannot afford such facilities.

This has led to a common feeling that computers and information and communication technology (ICT) be it hardware like laptops and high end computers, infrastructure and networking, broadband, and video conferencing or state of the art software, are for the ‘classes’ rather than the ‘masses’. This mega revolution that has transformed the world has left the poor, illiterate masses in villages and remote corners of the world behind, leading to the creation of a digital divide.

Competition and selection based on competence presupposes equal access to data, information and knowledge.

We need ICT initiatives to address the issues...
of affirmative action. We need to promote gender perspectives in computing so that computing will benefit women and those that belong to small backward communities.

**Digital Divide:** The reasons for digital divide are many and range from financial, technological to language, social and cultural issues.

The important reasons, causes of the digital divide are a comparatively lower spend on IT budget by the Government, existence of language barrier with multiple local languages and adoption issues, issues of open source and proprietary systems- IPR issues and resistance from bureaucracy.

Besides the above issues, lack of a unified policy by different government departments and agencies, existence of multiple platforms, which are incompatible with one another, fast technical obsolescence, and slow process of standardization and lack of clear documentation are also important issues, which will have to be studied and resolved if humane ways of using computing are to be worked out.

**Emotions:** Computers are not amenable to incorporating concern, emotion and feelings in their functioning and lead to regimentation and insensitive handling of situations and activities, in many cases. When individuals have to transact business with large corporations or with governments through computers, an insensitive application of the rule, which can be considered by the program to be nearest to the issue, under consideration, can sometimes lead to unjust decisions, against which it is very difficult for individuals to appeal.

**What Is Humane Computing:** Great Thinkers and philosophers in the second half of Twentieth Century like Karl Popper and Fritzof Capra have propounded that every new technology is an instrument of social engineering. The technology is used over a longer period, not only based on its merits of usability, utility and cost but it has also to be measured for the kind of change it brings to the society. Thus if computing or the way it is used blunts the human mental capacities, developed over thousands of years, its impact should be carefully studied. No technology is ethically neutral. So the impact of every new technology or the way the technology is sought to be used by the society must be of concern to the professionals in the field of the technology.

We also need to see that computers do not make humans into robots and destroy their individuality and originality of thought. What we need to prevent is regimented thinking / regimentation. In fact computers should be human friendly and human savvy, rather than people being forced to be computer savvy. All technologies, and in particular, a technology as ubiquitous as computing should be sensitive to the needs of the old, infirm, illiterate, non-urban, women, economically weaker sections and the like.

Technology brings about a paradigm shift not only in terms of new machines or new technological improvements but also in the way of life. Hence, the impact of the progress of science and technology on life has to be assessed in order to ensure that the progress of science is socially relevant.

Humane Computing is an attempt to promote study of ethics, empowerment, empathy, equality, environmental sustainability with reference to the use of this technology. Since it involves coming together and study of humans as well as computers, it involves technical as well as soft subjects and diverse disciplines ranging from computing technology to soft disciplines like sociology, psychology, education, medicine, behavioral science and communication theory. We believe that the study of Humane Computing will be able to provide insights, which may make it possible to bridge the digital divide and which may help tilt the usage of computing in a direction, which makes it work for promoting ethical practices.

![Contours of Humane Computing](image)

**Fig. 1**

The contours and boundary of human computing can thus be expressed to cover primarily three areas:

1. Making technology more humane by promoting human values including ethics, empathy and human emotion and values.
2. Making computing technology more inclusive by bridging the digital divide.
3. Harnessing technology for greater good of humanity including areas like health, agriculture poverty alleviation and improved governance.

These areas are distinct yet they do overlap as shown in figure 1. Humane computing is at the core where all three intersect, with each of them evolving into distinct disciplines like IT in Medicine, Green IT, etc as we move away from the centre.

India has always played a role of leadership in working out philosophical underpinning of human thought. Therefore it would be appropriate if we do not shy away from assuming leadership for growing the realms of computing to humane computing. The SIG on Humane Computing of the Computer Society of India is primarily aimed at working for this objective.

**What it is not:** Humane Computing is thus not to be mistaken with HCI or human computer interaction / interface, alone. Though this would make computers more people friendly that would just be a small part of the whole process. The real challenge is in computing becoming more ethical, people savvy, and sensitive to the needs and concerns of humanity at large.

**Humane computing - missing e’s in communication and Information Technology:** At the core of communication and information technology there is a need to pursue, preserve and foster human values that can be represented by the six e’s - empowerment, ethics, equality, empathy, environment, and excellence. Bringing the six e’s into the world of ICT will ensure that, rather than people being expected to be ‘computer savvy’ - computers will become human friendly - ‘people savvy’ and the enormous digital divide can be bridged. These are depicted in figure 2.

**Empowerment:** Knowledge is power. ICT based e-governance through initiatives like knowledge dissemination, self help programs and distance learning enables wide spread dissemination of relevant knowledge at affordable costs leading to empowerment of the weaker sections and the masses who did not have sufficient access to the traditional knowledge channels. However the big challenge is that computing is currently enveloped in jargon and is difficult to access and use. A village vegetable vendor uses a mobile phone effortlessly, but is not at ease handling a laptop or a palmtop, nor can she afford one.

An IT initiative to transform society by enabling all citizens to make the transformation from data to information and information to knowledge is necessary. This will help provide equal opportunity to all.
The e-cycle of ICT

- Empowerment
- Ethics
- Excellence
- Equality
- Environment
- Empathy

**Ethics:** Ethics is no different in ICT based e-governance and computers than from that in our day-to-day lives. This is true as the virtual world of cyberspace is but a reflection of the real world. The ethical choice reflects moral virtues (both personal and community oriented), produces more good than harm, does not result in favoritism or discrimination and ultimately fosters the common good.

Ethics also means practice of ‘dharma’ i.e. the path of righteousness and rectitude.

Ethical issues in ICT based e-governance center around appropriate/inappropriate use of computing resources and sharing of information. It also covers protection of confidentiality of data and privacy of citizens and protecting commercial rights by combating software abuse and piracy. Ethical and moral values need to be built into ICT from the beginning, right from the stage of developing the computer systems, programming them and also in their use. This means that computer professionals need to be exposed to a rigorous study of ethical issues during their studies and thereafter in their progression throughout their careers. Ethics like information security cannot be built into computing as an add on subsequently, but need to be present throughout the life cycle.

Moral and ethical values must become the lodestar for the normal work processes of IT professionals, ITES workers and even users.

**Computer Crime:** If one listens to one’s inner voice and makes responsible use of computer systems in a constructive manner, one will be ethical.

Recent instances like the terrorist activities planned using unsecured wifi connections and networks, intranets and internets as well as other such episodes highlight the potentially destructive and disastrous consequences ICT can have on the nation. This bears testimony to the nefarious motives of IT users and its noxious impact on concerned stakeholders and citizens of a democracy. Freedom should not mean the right to invade the privacy of others for furthering one’s divisive agenda. But this requires a safeguard to be built in and is not a flaw of the system itself. The Railroad is an advancement and a must in modern times. That it can be used to smuggle narcotics or arms does not make it an evil, it only emphasizes the need to protect and safeguard it.

Freedom of expression, especially now, when communications are almost instantaneous resulting in desktop broadcasting using tools like twitter has to be exercised responsibly and with restraint. Unlike the printed word, the e-transmitted word cannot be retracted, edited or blocked.

**Privacy:** There are certain ethical issues that have remained unaddressed. The most prominent is ‘Big brother is watching’ syndrome. You are replacing the ills of a backward society marked by lack of information with the other extreme (evil) of excess information and managed (dis) information with a spin. The current debate on the unique ID project in India, as well as the withdrawal of the citizen ID system in UK by the new Government are all manifestations of this issue.

**Social Cost-Benefit Analysis for New IT Projects:**

All computerization projects especially those related to ICT initiatives have to be evaluated on the parameters of social cost benefit analysis and total cost of ownership. We do not want to buy a powerful car to travel only a kilometer a day. Similarly if IT projects are evaluated on a professional basis, these would promote human well-being and employment by bringing out repetitive tedious activities, and pushing the frontiers of human abilities.

Total cost of ownership of software and e-governance solutions is very important. It is necessary to factor in the non-tangibles, the soft revenues/benefits and the soft costs. Projects, giving short-term benefit and resulting in long-term disadvantages to the society, must be rejected.

Unethical Use: Ancient gurus in their wisdom kept certain ‘mantras’ and ‘astras’ secret. Even today knowledge of the Atom Bomb is kept secret. There have been reports of misuse of the huge integrated databases developed and maintained by governments and corporates alike. This misuse is not restricted to sensitive information but even use for commercial purposes like cross selling and sharing customer databases.

Human mind is open to indirect suggestions, especially when it is addressed by a focused and powerful tool and medium provided by ICT. Pernicious advertising, which was severely indicted by Charles Medawar in his book titled “Social Audit”, is a bane of third world countries. It can be made possible and enhanced through unethical use of ICT.

**ICT based e-governance - a gold plating exercise:** ICT based projects generate mountains of data and important-looking information. These may provide a false sense of accuracy and security. Given our ability, capability and resources, we need ICT based e-Governance systems that are people’s delight.

What we need is a human touch - If fuzzy logic is missing, computers become nothing more than morons.

The thrust areas for humane computing thus are

1. Information at finger tips to ensure transparency
2. Disintermediation
3. Privacy protected databases
4. Minimization of delivery losses
5. Computers for the people and not vice versa
6. Excellence

**Empathy:** Empathy in ICT initiatives can be brought about by tuning ICT/Computers for the people and not vice versa.

**Environment**: Computers are currently not environment friendly and hence not humane to that extent. The total energy used by the server rooms and the computing facilities continues to rise exponentially. Moreover the issue of disposal of computer-waste is assuming an alarming proportion. Thus many countries have introduced a waste-disposal cess on purchase of any digital equipment.

Green computing is the future of computing – the need of the hour.

In the area of environment there are certain critical factors that need to be addressed on a war footing. These are:

- E-waste, and its Dumping by developed nations in our country
- Palming off of obsolete technology to India
- Indian users treated as guinea pigs for beta versions.
- Energy conservation not achieved through use of inefficient and legacy hardware and systems.

Physical and biological problems—radiation, diseases, infertility, cancer, headaches, hand and finger muscle problems, eyesight problems etc are required to be studied, as the use of ICT.
The computer also has to have an ethical dimension in all its dealings and transactions. There is an effort made by scientists to bring emotion into robots. This may help in building the humane element in the world of technology. Further, scientists are also working on building ethics into operation of a robot vide Mumbai Mirror - 10th November, 2010, p-25. This will also facilitate humane computing. Thus a robot can remind people to take their medicine and also provide feedback regarding non-compliance to the mentor or the person in fiduciary relationship with the patient, the nurse or the doctor as the case may be. Of late, robots are also being trained to help senior citizens. Similarly, a robot may be used in the future to advise patients on the potential benefits of medicine and also the damage that may be caused on account of non-compliance. However, the autonomy of the individual is well retained and if a patient does not want to take medicine the person perhaps cannot be forced. Of course, the research is in its early stage and is being developed in conjunction with artificial intelligence. In future, better systems for preempting frauds by providing advance warning signals to regulatory authorities may be built. Thus, the Satyam fraud could have been identified if an ethical dimension was built-in in the software programming. The current ratio of Satyam at 6 or 7 was always abnormally high. Analysts always assumed that it was an index of extraordinary liquidity. If a benchmark was given through adverse signals for any ratio above four (say), advance warning signals could have been provided.

Computing should be inclusive and affordable to enable and empower people and allow them to work and live on a level playing field. Inclusiveness should include all stakeholders cutting across different sections of the society and should keep in mind old, infirm, neglected, downtrodden, women, unemployed, the poorest of the poor. Thus, through this process computing can touch the lives of the teeming millions and be people friendly, promote affiliation and bonding rather than distrust and divisive tendencies. This will not only help them in agriculture and industry, but promote employment and provide health care and good communications at affordable costs leading to better governance. Such an opportunity given to a large section of the population will really promote fraternity assuring the dignity of the individual and create a platform for independence, creativity, compassion and sacrifice.

**Conclusion:** To conclude, the mantra is - enable, empower and enact. Eternal vigilance is the price of democracy. A technology driven society has to provide for built in alertness to successfully sustain the revolution of rising expectations of the citizens accessing the networks of the country and to retain the autonomy of an individual through privacy enhancing measures.

Finally at the grass root level citizens have to be vigilant themselves because decisions are decentralized and individual centric or group centric at the grass root level.

Empowerment has to be preceded by enabling and succeeded by vigilance.
will promote upliftment of poor, rural, underprivileged, weaker sections of society and the “women”.

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CSI invites Expression of Interest from Vendors who can provide end-to-end Conference Management Services for its International, National and Regional Conferences

According to its current plans, CSI will be organizing between 20-50 major International, National and Regional Conferences each year across the country each year, either by itself, or jointly with other organizations. It is proposed that CSI utilizes the services of an external vendor to create a common platform for managing all the phases of these Conferences in a uniform manner, from Call for Papers to publishing of the Proceedings. In the process, the platform will provide a common, single-point repository for all intellectual artifacts generated by these conferences, thereby providing a convenient reference point for Researchers, Academics and other users. It is likely that this repository will be based on one of the several Open Source systems already available, and also that eventually it will take the form of an Open Access Digital Library (OADL).

CSI seeks expression of interest from Vendors for providing all requisite services on a turn-key basis in order to make available these services for all CSI Conferences.

For more information on the scope of the project, please visit: http://www.csi-india.org/web/csi/conference-management-services

CSN Nominations Committee Requests all Valid Voting Members of CSI to exercise their Voting Rights & Cast their Votes through eBallot process only for election of Office Bearers to ExecCom.

The eBallots have already been Mailed along with Individual Password by CSI Election Co-ordinator to all the Members on their recorded E-Mail Id respectively on 22.12.2010.

Election site has opened & eBallot processes has begun successfully on 22.12.2010 at 06.30 p.m. IST.

Last date of receipt of eBallot - on 22.01.2011 at 06.30 p.m. IST.

Declaration of Results - 27.01.2011.

In case any Member has not been able to view the eBallot & Password on his recorded E-Mail Id, Please check your spam mails.

If not, Please Mail your complaint of non-receipt for verification & Rectification to CSI HQ on E-Mail Id hq@csi-india.org.

Postal Reminders have also been posted by HQ to all the Members at their recorded addresses without the Password.

Please note that Individual Password & EBallot will be mailed by CSI Election Co-ordinator ONLY to the E-Mail Id of the Member. Password & eBallot of a Member will NOT be sent by any other modes or to any other person under any circumstances.

- CSI Nominations Committee 2010-2011.
Call for proposals from Academic Institutions, Faculty members and other Individuals/Organizations for partnering with CSI to organize workshops at all Cities

Prelude: The Computer Society of India was conceived as a body of IT professionals in 1965. Since its inception, the Society has been driven by its mission to promote research, knowledge sharing, learning and career enhancement for all its stakeholders. CSI has throughout inspired the new entrants into the industry by cultivating the spirit of research and guiding their integration into the IT community.

The Society while working closely with other industry associations, government bodies and academia, envisions that the benefits of IT advancement should ultimately percolate down to every single citizen of India.

In pursuant to the above mission and objectives of the Computer Society of India, it is proposed to conduct a series of workshops across the Nation, by partnering with experts and organizations to enable the stakeholders move up the value chain. An indicative list of topics for the workshops is appended hereunder:

### Indicative Topics (but not restricted to these)

- Business Analysis
- Computer Forensics
- Data Mining using SQL 2008
- Data warehouse application in business
- Documenting Software Requirements using IEEE standards 830-1998
- Frauds and crime in Digital world
- ISO9001:2008(Revised Standards)
- ITIL (R) V.3 Foundation
- Payment Card Industry Data Security Standard (PCI DSS 1.2)
- VLSI
- Six Sigma
- Cryptography
- Network security
- Project Management Foundation Course for PMI-PMP
- Business Analysis
- Microsoft Project 2007
- Computer Forensics
- Software Testing
- Data Mining using SQL 2008
- Best Practices for Winning IT Projects
- Data warehouse application in business
- Software effort estimation
- Documenting Software Requirements using IEEE standards 830-1998
- Wireless security
- Frauds and crime in Digital world
- SQL Server 2008 reporting services
- ISO9001:2008(Revised Standards)
- Grid computing
- ITIL (R) V.3 Foundation
- Managing Cost in IT Projects
- VLSI
- Embedded Systems
- Six Sigma
- Artificial Intelligence
- Cryptography
- Cloud computing
- Network security
- Business Continuity Planning (BCP) and Disaster Recovery (DR)
- Project Management Foundation Course for PMI-PMP
- Bio Metrics

The workshop will be conducted by the chosen Academic institutions, Faculty members and other Individuals/organizations in collaboration with the CSI chapters. The CSI Education Directorate will extend necessary support in organizing these workshops and accredit the training institution/individual. The directorate will also complement (if required) by team augmentation with professional subject matter expert.

These workshops will be offered at a nominal fee for all categories of CSI membership and interested public. Suitable revenue sharing model between CSI and the participating individual/entity/chapter will be evolved.

The selected list of workshops, schedule and partnering entities/individuals will be finalized in consultation with subject matter experts keeping in view the current requirements of Business, Industry, Government, Academia, students, Research and Consultancy. The primary focus will be to concentrate on the “skill gap” among IT professional/practitioners, end users, faculty members and students and move them up the value chain.

**Submission Guidelines:** Interested Academic institutions, Faculty members and other organizations / resource persons may submit complete details along with an outline of the proposed workshop contents on or before 31st January 2011 by e-mail to admn.officer@csi-india.org along with copy to Vice President to vp@csi-india.org.

The proposal should include following details:

1. Title of workshop
2. Details of the proposer (Full name, address, e-mail id, organization, designation, educational qualification, years of experience)
3. Track Record of past delivery/Competence demonstration data
4. Duration of proposed workshop (No of Days)
5. Break up into individual sub-topics with their respective duration
6. Potential sponsors
7. Target audience, entry qualification and class size
8. Training aids required
9. Courseware availability
10. Training delivery model
11. Complementary skill required (to be sourced by CSI), if any
12. Preliminary budget (Estimated expenditure and Expected revenue)

**Special Notes:** The organizers of quality and well received workshops will be considered for special recognition in addition to CSI accreditation and award by the CSI. The particulars of key resource persons of the above workshop will be shared with the host Academic institutions, Faculty members and other Individual/organizations for conducting workshop at all locations across India.

M D Agrawal  
Vice President, CSI

Wg Cdr M. Murugessan  
Director (Education), CSI
Third IEEE International Conference on Signal and Image Processing (ICSIP 2010)

On first day of the conference, two tutorials were organized. First tutorial gave an insight about “Applied Image Processing on Defense Application”, delivered by Dr. Subrata Rakshit, Head Computer Vision, CAIR, Bangalore. To tell in a nutshell the key contents of his tutorial lecture was, an overview about Multi resolution, various Filtering techniques, Burt pyramids wavelet, Aliasing effects on edges with various real time examples, Image Magnification, Noise reduction in Images, PC based Noise Reduction, Multi Resolution coring, Image restoring, Image registration, Image Mosaic, Segmentation (Image/Video), Image and Video Fusion and its Applications.

Second tutorial gave an insight about “Semantic Web and Linked Data”, delivered by Dr. Monika Solanki, Professor, University of Leicester, U.K.

Summarize, the key contents of her tutorial lecture were Motivation towards the Semantic Web Application, moving from Syntactic Web (Current web) to Semantic Web, a clear view about Semantic Web and its Technologies, Data Linking and various Applications, Ontology concepts, Structure of Ontology and its needs, Ontology Language for Semantic Web, Ontology Engineering on Semantic Web, Resource Description Framework (RDF), OWL.

The keynote address was delivered by Dr. K. Chidnanda Gowda, Former Vice Chancellor, Kuvempu University, Advisor, Wipro, Bangalore. The gist of his speech was in accordance with the theme of our Third IEEE International conference on “Signal and Image Processing”. Another keynote address was delivered by Dr. Dipti Prasad Mukherjee, Professor, ISI Calcutta on Organ shape visualization using statistical shape model. Dr. P. Nagabhushan, Professor, University of Mysore delivered a key note address on Research problems around us: Image processing based futuristic problems.


The international journal “Image and Computer Vision” by ELSEVIER and MAJLEST, IRAN Journal of Electrical Engineering have proposed to bring out special issues on this conference.

The conference was inaugurated by Dr. P Mannar Jawahar, Vice Chancellor, Anna University Chennai on 15.12.2010. The special address was delivered by Mr. T S Rangajaran, Principal Consultant of TCS, and the inaugural function was presided by Thiru R S Munirathinam, Founder-Chairman, RMK Group of institutions and felicitated by Dr. K. C Gowda, Former Vice-Chancellor of Kuvampu university, Dr. Monika Solanki, Professor, University of Leicester, UK, Shri H.R. Mohan, Chairman CSI Div. IV & IEEE CS Madras, Dr. M S Palanichamy, Vice Chairman, Tamil Nadu State Council for Technical Education, Chennai, Shri T. Pichandi IAS (Rtd.), Shri. R M Kishore, Vice Chairman; RMK Group of institutions, Mr. Yalamanchi Pradeep, Principal, RMD Engineering College welcomed the delegates. Dr. K Dharmalingam, Dean, RMD Engineering College Proposed the vote of thanks and Dr. R M Suresh, Vice-Principal, RMD Engineering College gave a report about the conference.
1. **Streamlining of Operational Support Services and e-mail Correspondence:** The designated staff members for specific assignments along with e-mail IDs have been identified with a view to stream-line operation support services to the Chapters, Student Branches and Members. The important e-mail IDs include the following: Conference related correspondence (Mr. Pasha, Mumbai, conference.services@csi-india.org), Student Conventions (Mr. Yogendra, Chennai, student.conventions@csi-india.org), Membership Services other than Students and Institutional-Academic (Ms. Rashmi, Mumbai, member.services@csi-india.org) Student and Institutional (Academic) Membership Services (Mr. Mythreyan, Chennai student.membership@csi-india.org), HQ Help Desk Services (Ms. Sonali, Mumbai, helpdesk@csi-india.org)

2. **Membership Fee Revision:** As discussed and approved by the ExecCom and National Council Meetings held during CSI2010, the membership fee for all categories of members will be revised w.e.f 1st April 2011. The revised member fee is available at our CSI website. It is our earnest appeal to the CSI Chapters, Student Branches and the individual/institutional members for immediate renewal of the membership and enrollment of new members taking benefit of this grace period till 31st March 2011. President and Membership Committee appeal to the CSI members for volunteering their services in the membership renewal and enrollment of new members. The designated full-time staff may be approved for any assistance at Mumbai (member.services@csi-india.org) for membership of all categories other than students and institutional (academic) members and Chennai (student.membership@csi-india.org) for students and institutional members. The members at the Chapters and Student Branches may prepare action plans for the proposed CSI’s Out Reach Programmes (6 major sectors namely - Business, Industry, Govt., Academic, Research and Consultancy). The volunteers will be provided the necessary supporting CSI multimedia presentation/PPT slides/brochures and possibly list of potential organizations’ contact details which could be of help. The partial expenses incurred by the chapters and student branches will be born by the HQ on a similar pattern followed for sharing membership fee. The individual members volunteering for membership renewal and enrollment of new members will be considered for appropriate reward. The members may send their suggestions/inputs on how to enhance the membership value and benefits keeping in view of globalized scenario. A suggested approach for the professional development of chapters and members is available at CSI website.

3. **Call for Research Proposals, Case Studies, Technical Papers and Articles:** The Chapters, Student Branches and Members at large are requested to submit the Research Proposals and Case studies involving development/deployment of ICT in socially relevant sectors and especially catering to the needs of unrepresented geographical areas and segments of society, including how far CSI Programmes have helped and/or can help promote further growth of ICT. The proposals may also include surveys to assess the reach and effectiveness of CSI programmes including membership development. The innovative and path-breaking proposals from CSI member faculty and students will be considered for financial assistance as per guidelines applicable for CSI minor research grants. The research work and case studies will also be considered for publications in CSI periodicals and proposed Research Digests. The proposals may please send to csi.research@csi-india.org with cc director.edu@csi-india.org.

The members may be encouraged to send their technical papers and articles for considering to the respective CSI periodicals namely, csic@csi-india.org (CSI Communications), csi.journal@csi-india.org (the Journal of CSI), csi.adhyayan@csi-india.org (CSI Adhyayan) and csi.enewsletter@csi-india.org (CSI eNewsletter). The best contributions in each categories will be considered for recognition and suitable reward.

5. **Call for Volunteers for Strengthening Special Interest Groups:** The CSI Special Interest Groups are formed by the domain experts in the emerging technological fields and/or socially relevant fields to meet the requirements of the national priorities. The CSI SIGs will be governed by the CSI SIG Coordinaton Committee at the national level. A designated SIG Chairperson will be an special invitee to the ExecCom meetings. An Operational framework and a set of generic guidelines have been arrived at (published in this issue of CSIC and available on CSI website). It is essential from the CSI SIGs to reach out to experts within CSI and beyond. On the other hand, it is in the interest of our CSI members to join and work as volunteers with the CSI SIGs of their choice. It is highly desirable that theCSI SIGs to utilize the infrastructural support of the CSI Chapters, Student Branches and Member Institutions across India as well draw strength from and associate with the programmes/activities of CSI Divisions and its partner professional societies and organizations at national/international level organizations. The Further details and guidance can be obtained by writing to vp@csi-india.org

For further details, please visit: http://www.csi-india.org/web/csi/volunteers

6. **Request for Proposals from the CSI Chapters for Hosting/ Organizing CSI Regional, Divisional and SIG Events in 2011-12:** Apart from the flagship event the CSI Annual Convention, the RVPs/Divisional Chairpersons/SIG Chairpersons Divisions/SIGs have been organizing various events with a view to cater to the region/domain-specific needs of members. In order to prepare the CSI Calendar of events for 2011-12 and ensure that these events do not substantially overlap in their organizational process and expected outcomes, the Chapters and other organization entities are requested to send their proposals of events planned in 2011-12 by e-mail to conference.services@csi-india.org with cc to the RVP/Divisional Chair/SIG Chair concerned

7. **Call for Participation in the 27th CSI NSC, Request for Proposals for Hosting Student Conventions in 2011-12 and Call for Nominations of Student Coordinators:** The Chapters and Student Branches across India are requested to encourage the students to participate in the 27th National Student Convention, 9-12 March 2011 at ITM Gwalior. They are also requested to send the proposals of hosting and organizing National/Regional/State Student Conventions in 2011-12. The proposals of vibrant CSI Student Branches may be submitted by e-mail to student.conventions@csi-india.org with cc to the National/Regional/State Student Coordinator concerned. The CSI members are also requested to volunteer their services as Regional/State Student Coordinators. The nominations (in the prescribe template) can be submitted to director.edu@csi-india.org with cc to secretary@csi-india.org. The Chapters and Student Branches are requested to offer their views and suggestions on the proposed special services to CSI student branches.

Prof. H R Vishvakarma
Hon. Secretary, Computer Society of India
The 16th International Conference on Management of Data COMAD 2010 was inaugurated at VNIT by Dr. C S Moghe, Director VNIT Nagpur. The conference was attended by a large number of distinguished academicians, delegates, participants, researchers, and people from media. This has been one of the major events of the CSI Division II [Software].

Dr. Stephen Brobst, Chief Technical Officer, Teradata Corporation delivered the inaugural keynote address on ‘The Future of Data Warehousing’. According to him today we are producing data much more than we can store it. More data has been created in the last three years than in all past 40,000 years. Total data has quadrupled in the last three years.

Business and government decision-makers must have a strategy for dealing with all that data. Some of the current applications generating a lot of data are mobile phone network activity, RF tagging, Continuous health monitoring etc. But according to Stephen as against obvious perception most of the data that will be generated in future will be from sensor nodes and not from the Internet or for that matter Facebook. He further commented on the shift in the Hard disk technology, the need for Active Data warehousing and pervasive Business Intelligence as the future business model.

There was an invited industry talk by Dr. Pramod Varma Chief Architect, Unique Identification Authority
of India (UIDAI) on ‘Data Management Challenges in India’s Unique Identification Number System’. He highlighted the challenges in establishing identity. He discussed the ‘AADHAAR’ system being developed by the UIDAI and the design of the system in detail highlighting the Application, Authentication and Enrollment modules of the project. He cited some of the architectural highlights as No vendor lock-in across the system, Use of open-source technologies wherever available and prudent, Use of open standards to ensure interoperability, Ensure wide device driver support for biometric devices through standardization, Use of widely adopted technology platforms and tools, Make all performance metrics (no PII) public through business intelligence portal for transparency and finally Building a strong end-to-end security upfront.

On the second day the keynote address was delivered by Prof. Divyakant Agrawal of University of California, Santa Barbara on ‘Scalable Data Management in the Cloud: Research Challenges and Opportunities’. The major focus of the talk was about cloud computing and its issues relating cloud and data. He emphasized the fact that there is an insatiable need for data, process and resources. He also spoke about the economics of cloud computing and risks involved in over provisioning and under utilization of resources.

The second research Session after the keynote featured an award winning paper by Shrinivasan Sengamedu from Yahoo Bangalore. He discussed about wrapper based extraction technique. Mr. Shengamedu also introduced the use of conditional random fields across web sites. The next paper in this section was by Mr. Shailesh Deshpande of TCS India. He spoke on the unsupervised approach to sentence Classification. He gave a new perspective towards sentence classification by citing the importance of linguistics over statistical methods to classify sentences.

During the invited industry session, Rajesh Doshi Executive Director NSDL, India discussed about system performance challenges faced by NSDL at varying workloads. He gave an interesting talk by taking the audience on a journey from the ages where equity shares dematerialization actually happened in the country and what challenges NSDL faced after that. Presently IIITB has taken some initiative and is working closely with NSDL to redevelop the system as quoted by Mr. Doshi.

Mr. Sangameshwar Patil from TRDDC (India) talked about data base migration and various technical details involved. He also cited the importance of the activity in case of Merger and Acquisitions between organizations. Prasad M. Deshpande spoke on Content Aware Master Data Management. He explained the various complex processes involved and extraction of data from documents which are inherently unstructured in nature.

The tutorials session on ‘Data Mining Problems in Internet Ad Systems’ featured Prof. S Muthukrishnan (Rutgers University). The session was well attended by people from academia and industry. The second tutorial session was by Dr N Jayakumar Natarajan (Bharathiar University) on ‘Information Retrieval and Text Mining Opportunities in Bioinformatics’.

The third day featured the keynote by Prof. Soumen Chakrabarti on ‘Making Web-scale Entity-relationship searches a reality’. According to him over 99% of queries to Web search engines contain a noun, often referring to an entity. Entity catalogs like WordNet and Wikipedia list millions of well-known entities. Bootstrapping techniques may help expand that to hundreds of millions of people, millions of locations, books, songs, and other artifacts. The next problem in Web search is to represent, index, query and rank in a fine-grained graph-structured setting where dozens to hundreds of tokens on Web pages are annotated with entities, which in turn have attributes as well as type, subclass and other relational linkages. He also discussed recent advances in indexing, metadata in information retrieval, entity annotation, graph search and mining, and machine learning for ranking that are coming together to take us to the next level of search.

The tutorial on ‘Representing large-scale uncertainty through probabilistic databases’ was delivered by Dr Prithviraj Sen, Yahoo labs, India. He introduced the audience to this relatively new field in databases. He spoke on modeling uncertainty in databases.

The research session featured talks on ‘Selecting a Right Interestingness Measure for Rare Association Rules’ by Akshat Surana, ‘Bayesian Network & Outlier Detection’ by Sakshi Babbar from University of Sydney, and ‘A Robust Learning framework using Item-set Based Dynamic Rule Sampling’ by Bhankurikan Vinzamuri from IIIT, Hyderabad. Bhankurikan indicated another research area in this domain on designing more effective assessment metric for active learners.

As a part of COMAD 2010 the “SIGMOD 2010 Highlight Session” was organized. The papers “Bed-Tree: An All-Purpose Index Structure for String Similarity Search Based on Edit Distance” by Zhenjie Zhang (NUS, Singapore), Marios Hadjieleftheriou (AT&T, USA), Beng Chin Ooi (NUS, Singapore) and Divesh Srivastava (AT&T, USA) and “Constructing and exploring composite items” by Senjuti Basu Roy (UT, Arlington), Sihem Amer-Yahia, Ashish Chawla(Yahoo Research), Gautam Das (UT, Arlington) and Cong Yu (Yahoo Research) were presented in this session.

Finally COMAD 2010 concluded with a Gong Show in which select speakers were given an opportunity to speak briefly about their research activities and discuss future scope. This activity was intended to motivate student participants in taking up future research work in Databases. Prof S. Sudarshan and Prof. Soumen Chakrabarti from IIT-Bombay, Prof T.V Gopal from Anna University, Prof Shrinivas Kumar IIT-Madras, Dr. Prasad Deshpande from IBM India, and Dr Zhenjie Zhang National University Singapore were among the eminent speakers for the Gong Show.

The conference saw a lot of participation from local researchers, academics and industry and helped them put their research work on the global perspective.

The conference concluded with the vote of thanks by Prof A.S. Mokhade from VNIT Nagpur. 

Humour
How to Please Your I.T. Department

When I.T. support sends you an E-Mail with high importance, delete it at once. We’re just testing.

Send urgent email all in uppercase. The mail server picks it up and flags it as a rush delivery.

Don’t learn the proper term for anything technical. We know exactly what you mean by “My thingy blew up”.

CSI COMMUNICATIONS | JANUARY 2011

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1. Introduction:

The 6th National Conference IT for Defence was organized by the Special Interest Group on Information Security (SIG-IS) on 2nd & 3rd Dec 2010 along with Defence Research & Development Organisation (DRDO) and Computer Society of India – Bangalore Chapter at NIMHANS Convention Centre, Bangalore.

The theme of the conference was “Emerging Technologies in the Modern Battle field Scenario”. Dr. C R Chakravarthy was the Event-Chair, Mr. T. Sabapathy-Program Chair, Dr. Anirban Basu-Organising Chair, Mr. Vishwas Bondade - Finance Committee Chair and Mr. T N Seetharamu – Registration Chair.

The conference was fully supported by DRDO not only in terms of Platinum Sponsorship and also Sponsoring delegates (more than 160 delegates) and a large number of speakers, most of them being senior scientists. The Conference was ably supported by the IT industry. Platinum sponsors were M/s. Barco and KPMG, while Vmware, Intel, RTTS, Public Sector Undertakings - M/s. Bharat Electronics(BEL) and Electronics Corporation of India (ECIL) were the Gold sponsors for this event. The conference was extremely successful with more than 200 delegates.

Prof. P Thrimurthy, the President of CSI and Prof. H R Vishwakarma, Hon. Secretary of CSI were also present at the conference. The meeting of the Special Interest Group on Information Security was also held on the evening of 2nd December 2010.

Apart from the Keynote Inaugural address by the Chief Guest, there were nearly 20 Invited Speakers covering various topics on the theme of the conference. Another unique feature of this conference was that a special track on Cyber Security was organized on the 2nd day of the Conference, wherein leading information security professionals addressed on various topics of Cyber Security.

2.0 Highlights and Objectives of the Conference: Dr. C R Chakravarthy, Convenor, SIG-IS

With the advent of technological advancements, the war scenario has changed phenomenally over the past decade. The flip side is that it has dramatically reduced the time to react. The effort of gathering data across the three armed forces, processing & analysing the data, taking decisions and communicating them back to the ground level forces has reduced to near real time, further reducing the time to react. Network Centric Operations has evolved to address these challenges. Modern Defence is moving several levels up from C4I to C5ISR, an integrated mechanism to wage effective war. The major IT challenge is how to integrate and assimilate data across heterogeneous systems to provide faster decision support to the decision makers of Defence.

The scenario has changed in terms of Internal Security as well. With the growing trend of “Proxy wars, Terrorism and Cyber wars”, it has become extremely important for Defence to address both internal and external threats.

The two day conference attempted to find answers to the following questions:

- What are the technology enablers that will reduce time to react on the battlefield?
- Are newer technologies helping in moving up network centric operations to subsequent higher levels?
- How can the ubiquitous presence of mobile devices be used to military advantage? What are the special needs for secure communications in this context?
- What are the technologies available to meet these needs?

This conference brought together senior scientists from various Defence labs across the country, many vendors from the Private IT sector, Department of Defence and the military on one platform, and explore how emerging technologies will help in changing the Defence of the country, the inherent risks and threats they bring, and effective ways of mitigating these risks and reducing the threats they pose.

Day 1: 02 December 2010

2.1 Address by the Chief Guest Dr. Sreehari Rao:

Dr. R. Sreehari Rao, gave an insight into the upcoming technologies of Defence. He stated that the Information Technology has had a great impact on the present day warfare systems. Current war scenarios have posed extreme challenges in terms of drastic reduction in reaction time to combat the enemies weapon systems. The Network Centric Operations is critical for all future wars. There would be phenomenal increase in the volume of data and integration between data gathered from Airborne, Ship borne and ground weapon systems would be required to take decisions.

It should be recalled that Indian armed forces uses technologies drawn from many countries as well
as bringing out indigenous home grown systems. The real challenge would be the gathering and collating of information from these heterogeneous platforms and taking operational decisions in real time. The emphasis would be on development of long range radars, integrated electronic warfare systems and integrating all these into a single framework. There would be remarkable developments in the electronic surveillance systems, 3D and 4D surveillance radars, multi-static and cognitive radars, flares and chaffs (passive electronic counter measures), E-Bombs and Space Borne Electronic Surveillance systems, the electro-optics technologies, and IR platform would see the major developments in the future. He also mentioned that “Information Security” would be of great importance and “Information Warfare” will have a new dimension in the futuristic warfare systems.

3.0 Technical Sessions:

3.1 Session Chair N. Sitaram, FNAE (Former CCR&D) and Distinguished Scientist DRDO, now advisor at BEL.

Developments in IT have been strongly influencing conduct of military operations, and even doctrines. Those who have been attending CSI ITD conferences, as I have been, would have clearly seen this trend. The early conferences would have seen stress on use of IT for “Digitising the Battlefield”. This was to take advantage of emerging digital computation, communication and storage technologies for more efficient battle management. In more recent conferences one could note the trend towards so called “Network Centric Operations” (NCO). Central to NCO is a highly networked battlefield where everyone and everything in the battlefield is connected up through a versatile network. Such networking, if used properly, has the potential to revolutionise military operations through shared situation awareness and effective collaboration.

In the military context, the networking required for NCO heavily relies on radio communication with ever increasing demands on bandwidth, thus putting strain on the meager spectrum available. The role of IT in making these radios “software defined”, and hence potentially versatile, reconfigurable, and smart (“Cognitive”) is huge. I would suggest that future editions of ITD Conferences devote a session exclusively for Software Defined/ Cognitive Radios.

3.1.1 Rear Adml. Bahl, Director General WESSEE of Indian Navy Spoke on “Architecting a Net Centric Enabled Future Combat Management System” Naval Combat Management Systems (CMS) are becoming more and more complex due to advances in weapon and sensor technologies. On the other hand, conventional platform centric military concepts, tactics, doctrines and strategies are being replaced by network centered ones. This shift from platform-centric to network-centric systems requires that network-centric concepts need to be “designed in” for future CMS systems. Network Centric thinking shifts the focus from legacy stovepipe systems and platforms to optimized use of resources that transcend platform boundaries and span multi-threat dimensions. Current Naval Systems are not designed from a network centric (multi-platform) point of view and have focused on design of individual systems and have attempted to achieve interoperability in an “after-the fact” method by focusing on interfaces between the systems. The presentation shall aim to present the design and processes approach at WESSEE that realizes this concept for future Naval CMS systems, both for indigenous CMS programmes & systems that are being acquired and suggest a way ahead for networking legacy systems.

3.1.2 Shri. Murali, Scientist of Defence Electronics Research Laboratory, Ministry of Defence spoke on “Evolutionary Architectures for Futuristic Electronic Warfare” Networked Electronic Warfare (NEW) is a fresh paradigm which offers a collection of task-oriented or dedicated EW systems that pool their resources and capabilities together to obtain a new, more complex, ‘meta-EW-system’ which offers more functionality and performance than simply the sum of the constituent EW systems.

While there is growing recognition of the importance of NEW, there is little debate on architecture(s) required to realize the goals of NEW. This presentation proposes taxonomy of these super-EW-systems and exhibits architects principles to assist in their design.

3.1.3 Mr. Lalit Mendiratta , Sales Director, Barco Electronic Systems (P) Ltd spoke on “Visualization for Collaborative Environments” The importance of the Sand Model Room in the army cannot be over-emphasized. It is a place where vital tactical training can be given to the officers and men of the army, without having to waste resources on the logistics of conducting such an exercise on the ground. Training on any operation of war or peace, on different terrain, be it the training for actual war, peace keeping operations and mobilization for any emergency or situation of disaster management, can easily be rehearsed using the sand model rooms.

4.0 Technical Session: 2

4.1 Ashvin Vellody -- Director in KPMG, Spoke on “Top 5 Technologies and their probable applications to Defence” Technology refresh is dynamic in today’s environment. Understanding sustainable technologies and their probable applications is paramount to adopters.

4.2 Mr. S. Natarajan, GM Embedded Business of M/s. Intel Technology India Pvt Ltd, spoke on “Embedded Intel Systems with reference to the Architecture in Military, Aerospace and Government” defense systems.

Intel’s embedded processor platforms based solutions are available for military, aerospace and Government market segment. Solutions based on embedded Intel architecture have been offered by many of Intel’s ecosystem partners in the areas of “command, control & communication”, “surveillance, reconnaissance & intelligence”, “training& simulation” among other areas. This session covers the details of the technologies around Intel embedded
processor platforms and software tools that could be leveraged for building solutions for these vertical segments. This session would be useful for people involved in specifying technology requirements, developing hardware and/or software for solutions and also users who are involved in such solutions.

4.3 Dr. H V Srinivasa Rao, Director, ISSA, spoke on “Military Modeling and Simulation in Information Age”

Computerised war games, modeling & simulation are the only cost-effective scientific means available to create synthetic environment to train commanders for their mental preparedness in envisaged war like situations. Current, majority of war games developed world over are focused mainly on training aspects of warfare drills and procedures. However, war games also need to address the planning and strategy development requirements. This calls for a thorough understanding of the current and future warfare.

The concepts of warfare have been changing from platform centric to network centric. There has been transformation of the force world over in the new context of Information age. Network-centric warfare (NCW) has been propounded as next revolution in military affair (RMA) and highlights a major shift from attrition-based warfare to “shock and awe”. It is an emerging military response to information age and is as much about human & organizational behavior as it is about technology. Information age has shrunk geography and increasing asymmetric nature of conflicts has obscured the strategic, operational, and tactical rules of engagement and we have to adapt to this changing realities. Information superiority, achieved through operation of critical infrastructure and in computer networks play in the effective computer networks could be isolated, the human users straddle the gaps with mobile media and thus bridge the isolated cyber space’s into one large connected space accessible from anywhere.

While external threat is easier to identify and to counter, the insider threat is by nature insidious and recognizing and neutralizing it is likely to be a constant challenge. As information technology continues to advance, the complexity of the cyber space assets increases as well, making verifiability a permanent challenge. The asymmetry between the defender and attacker in any space is present in cyber space as well. Therefore complete preventive protection and absolute assurance is a challenge, especially when human users are an integral part of the cyber space systems. Perhaps the biggest challenge is to keep the Defence intact in the face of the ever changing and open world of information technologies that form the substratum of cyber space. Paradoxical as it may seem, the pertinent question is can we meet these challenges by making computers more like humans?

Malware which is nothing but malicious software is primarily designed to access system & its resources through unauthorized & undetectable means. Reverse Malware Engineering is a science of understanding the working by breaking it down & tearing it apart and then putting it together.

6.3 Dr. K Rama Subramanium, Director & CEO, Valiant Technologies Pvt. Ltd., spoke on “Fierce Battle with no bloodshed – the imperatives of cyber warfare”

Sun Tzu’s description of a great military strategist best suits cyber warfare. The wise Sun Tzu said that great strategists destroy
the enemy without attacking him. That is the *modus operandi* of cyber warfare, as it is typified today. The celebrated Dartmouth College paper on cyber warfare that presents the state of preparedness of six countries (including India but excluding the US) talks of nation states formally recognizing cyber space as a new domain in warfare. This new domain has been referred to as the “fifth domain of warfare” by *The Economist* when articulating on the realities of cyber warfare. Each of the six countries surveyed are in different state of preparedness and are reportedly banking on different strategic advantages enjoyed by them.

This emerging domain of warfare does not look at decimating the armed forces and their fighting prowess as has been the objective of conventional warfare. The attack happens clandestinely behind the enemy lines, in a highly sophisticated manner harnessing the immense potential of technology and the ubiquity of networks that connect computers across nations. Prof. Cerf and his colleagues will surely be disappointed to know that the IP packets they designed to carry knowledge across the US research and military establishments in the event of an attack, is now carrying data with payloads as devastating as an atomic explosion. Despite all that is written about the inability of IP protocol to carry SCADA traffic, multiple validated surveys demonstrate that organizations are continuing to use IP protocol as carrier protocol and bundling it with DNTP to make this carrier protocol SCADA compatible.

That removes the last impediment to launch a cyber attack on SCADA networks via the ever obliging Internet backbone. Once that is established, what remains to be decided is the type of attack.

Is the enemy’s water supply made to carry, as an addition, sewerage also? Do you want the enemy’s electric supply system to push through unregulated voltages to damage equipments including critical infrastructure that depends on electric power to monitor and regulate key parameters; would you like to see enemy’s steel plants producing steel with wrong parameters so that the output is too brittle to form an armored shield? The options are endless and in each of these cases, the enemy is effectively crippled economically, socially, psychologically and strategically. What more does a military commander want except to cripple the enemy to surrender without a drop of blood being shed?

6.4 P K Saxena, Outstanding Scientist, Director, SAG Spoke on Information Security - Encryption and Beyond.

Dr. P K Saxena gave an excellent introduction on the Information Cycle-methodology of information creation, secure protection and deletion/destruction of information. He started with security classification – restricted, confidential, secret and top secret with particular applications to Defence applications. He mentioned that the Security cover time will range from one week to ten years depending on the classification of Information. Top secret messages would definitely require a cover time of ten years. He also emphasized on the importance of Network Security and Web security. Dr. Saxena gave a brief outline on the symmetric key systems and public encryption techniques.

He then dwelled on different methods of security attacks, and interception techniques. He gave the list of Breaches in Security Incidents in India in 2009 based on the Information of CERT in India. He also highlighted on Security safeguards - Technology, Protocols, layer based policy and End-to-End security. He gave methodology of key management protocols, steganography Techniques and speech secrecy systems.

7.0 Technical Session : 5

Session Chair: H. Srinivasa Rao

7.1 Mr. Velayutham, Scientist at Central Research Laboratory (CRL) of Bharat Electronics Limited (BEL) spoke on “Service Oriented Architecture: It’s suitability to C4ISR Systems”.

Most of the components of warfare systems are distributed and loosely coupled. Yet they are critically dependent on each other to attain the objective of the War. The war in this century is driven by Information and communication and computing technologies. Hence the warfare systems to be developed should support unique characteristic of systems and resources being distributed in nature. Traditional way of developing software solutions as standalone or client server application will no longer meet the requirements of futuristic warfare system. There is a need envisaged for a paradigm shift in developing solutions for C4ISR systems. Service Oriented Architecture is a paradigm for defining, organizing, and utilizing distributed capabilities in the form of loosely coupled interoperable software services that may be under the control of different ownership domains. Each system functionality has to be developed as a service, where the access is provided using a prescribed interface with policies as specified by the service description. WSDL (Web Services definition Language) and SOAP (Simple Object access Protocol) are the driving forces for developing SOA based solutions.

8.0 Technical Session : 6

8.1 Smt. V Prameela, Sc’G’, Associate Project Director, DRDL spoke on “Realisation Approaches for Weapon Complex for tactical missile System”.

For the effective utilization of weapons and to attain maximum impact of the mission, weapon complex plays a major role. Realisation of weapon complex for tactical systems encounters challenges in the design, system engineering, simulation and validation of integrated complex. Proper analysis in the time and space domain, tool based design, anti jamming communication and compliance to standards, fast reaction MMI will ensure the performance in the field. The weapon complex will be effective if all the C4ISR/C4I sub systems work synchronously in integrated manner. Integration issues can be minimized if proper engineering process (with documentation) and standards are followed. Realisation of weapon complex based on C4ISR for Tactical weapon systems is discussed in this paper. The studies include the effectiveness of the weapon as well as the weapon complex which also include the survivability, scalability, failure mode operation, redundancy management, embedded software, Interoperability, deployment analysis, mission analysis, and secured communication and user friendly systems. Time synchronization, multi layer communication, software design, integration are the key areas of interest. Two case studies of realization approach of tactical weapon complex for static and dynamic targets are under consideration. Weapon systems in the forth coming year needs to enable Network centric operation.

8.2 Dr. PVRR Bhogendra Rao, SC 'E', DRDL, spoke on "Pattern-oriented design of C4I software and the advantage of CASE tools”.

The C4I software is the critical element of the whole C4I complex as it plays vital role not only in decision support to the military commander but also in coordination of all the stations of the complex. This software is highly computation intensive and often, it mandates to be designed as distributed software, further adding to its complexity. The performance and design of the C4I software of mission management system has great influence on the success of the mission. It is a mission critical, time critical and distributed real-time system.

Design patterns can speed up the development process by providing tested and proven development paradigms. In order to achieve flexibility, design patterns usually
introduce additional levels of in-direction, which in some cases may complicate the resulting designs and hurt application performance.

Similarly Computer Aided Software Engineering (CASE) tools have been in the industry for long. However, the use of CASE tools in real-time C4I domain has been very little.

8.3 Dr. Dipti Deodhare, Sc ‘F’, CAIR, spoke on “Technologies for Net Centric Operations”

With a phenomenal adoption of information technology by the military, the battle space is now digitalized. Further, with a conscious paradigm shift from platform centric warfare to network centric warfare, the requirement for military systems to be able to perform operations autonomously has only become more critical. Network Centric Warfare (NCW) has been defined as an information superiority-enabled concept of operations that generates increased combat power by networking sensors, decision makers, and shooters to achieve shared awareness, increased speed of command, higher tempo of operations, greater lethality, increased survivability, and a degree of self-synchronization. NCW concepts promise to translate information superiority into combat power by effectively linking knowledgeable entities in the battle space. The Centre for AI and Robotics is nurturing and progressing enabling technologies for Net Centric Operations.

With military computer systems becoming larger, more complex, more heterogeneous and more dynamically varying, a centralized human control for these systems is impossible. In addition, military system design has to be based on the premise that there is an enemy who is doing his best to disrupt and destroy own/friendly capabilities. This means that nothing can be completely relied upon. Consequently, key capabilities should include: (i) the ability to dynamically adapt to change, (ii) agility to identify and grasp fleeting opportunities, and (iii) robustness in the face of potentially catastrophic disruption so as to demonstrate graceful degradation in adverse conditions and progressive enhancement in performance as conditions improve. Most importantly, every critical military activity in battle, which is driven by human decisions, needs to be supported to help make sense of the tactical environment - with a capability to reason in relation to the battlefield workflows, and influence possible future outcomes on it. In complexity is to be the order of the day, more intelligent autonomous capability will clearly be the order of the day, in so far as military systems are concerned. But the human element still will remain critical to the military process. Therefore, although military systems should be capable of demonstrating virtually autonomous behaviour, they also need to be fully accessible and interactive so that in the relevant contexts, they easily lend themselves to control by human commanders at every echelon of military hierarchy.

Keeping the above design requirements in mind, it is clear that future military systems need to be designed to be cognitive systems. Cognitive systems are systems that perceive a change in their environment and responsively enact changes to their functional parameters so as to maintain the same output threshold. In this talk, some technologies and approaches that can contribute towards building military systems that reliably and convincingly demonstrate autonomous behaviour was presented. The talk also touched upon concepts of Semantic SOA, Planning and Decision Support, and Case-Based Reasoning techniques.

9.0 Technical Session 7

Session chair: T. Sabapathy,

9.1 Ms. Pankaj Srinivasan, Technical Lead, Real time Technologies Ltd., spoke on “Open Splice DDS in Defence, Aerospace and Next Generation Net centric systems of systems Infrastructure.”

Next Generation network centric applications require that the right information is delivered at the right place at the right time. Achieving this task poses several challenges that if not properly addressed by a middleware platform, can dramatically increase the complexity that has to be dealt with, by applications. Open Splice DDS has been used to successfully develop and deploy next generation network centric applications. Open Splice DDS’ proven architecture, rich QoS and features support is the ideal choice for you to address the challenge posed by today’s requirements.

Current & future net-centric systems-of-systems, such as combat management systems, land systems, & air traffic control systems, are being developed in coalition-based consortia. In these systems-of-systems different parties provide components of applications & infrastructure, much of which is based on COTS components.

In these heterogeneous environments, integration of software components becomes a major challenge, not only at the protocol level, but also in terms of common semantics & overall systems-of-systems behavior. To facilitate the integration of net-centric systems-of-systems, a Common Information Model (CIM) is needed to express the semantics of relevant information & fulfill functions in the development process. For example, a CIM can help elucidate requirements from customers during earlier phases of a project and can also provide a basis for component-based software development and large-scale reuse of assets in software product lines during the later phases.

9.2 Mr. Ashish Sonal, CEO, Orkash Services Pvt. Ltd., Spoke on “Intelligence generation & battlefield management in a net-centric environment”

Maintaining and gaining information superiority is the fulcrum of modern day network-centric warfare. Consequently, intelligence generation and management has become an integral part of enhancing operational capability of the armed forces. It is a massive challenge to transform the concept of network-centric warfare into operational capability and outline a prudent manner of addressing it.

The country’s internal security has undergone a rapid change over the past decade with respect to complicated dynamics emanating from Naxalism, terrorism and extremism. ORKASH – an India headquartered international hi-technology firm, recently launched a first-of-its-kind customised and localised network-centric battlefield management system specifically designed for counter-insurgency, anti-Naxal and anti-terrorism operations. Named as ‘Unconventional Conflict & Intelligence Management System’ or ORKASH-UCIMS, the system is designed to generate actionable-intelligence on a geospatial platform and specifically facilitate operational and tactical planning and execution in a network centric environment. It also acts as a networked and integrated real-time command & control platform.

10.1 Valedictory Session:

The following were present
Dr. C.R. Chakravarthy, Mr.T. Sabapathy, Dr. Anirban Basu, Mr. Vishwas Bondare, Mr. Raghavendra Rao.

Dr.C.R.Chakravarthy, summarized very briefly the proceedings of the conference, he thanked Dr.Sreehari Rao, Chief Controller of Research & Development, DRDO for his kind patronage and keen interest taken for this conference. His talk “Set The Tone” on for the deliberations of the Conference.

11.0 Conclusion:

The IT for Defence conference has become a very prestigious conference of Computer Society of India with active participation of top officials from DRDO, Ministry of Defence, leading IT Industry and Academia. The President and Secretary of Computer Society of India very much appreciated the response and hold this Conference in “High Esteem”.
### Chapter News

Please check detailed news at:

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Mr. M D Agrawal, Vice President - CSI | 9 October 2010: “Inauguration of Chapter Premise” |

*Vice President M D Agrawal inaugurating chapter premises*

*Section of audience during inauguration of premises*

| **BANGALORE** | 20 November 2010 : “One-day Training on Business Analysis” |
Mr. Balasubba Raman Guruswamy (CSI-BC) and Mr. Suresh Thiagarajan (Start Run Training Academy). | The session began with an introduction to business analysis covering topics on roles and responsibilities of business analyst. Participants had hands-on sessions for defining mission, objectives, strategies and tactics for a given scenario of business. Subsequent topics included planning for requirements using KY’X’ technique and also elaborated on the skills required to become a business analyst. A pointer was provided to the participants about a free-to-use online tool that can assess the skill set of a business analyst. The session explored the various elicitation techniques including interview, brainstorming, JAD (Joint Application Development), Scenarios and User Stories. Verification of the requirements using ‘mind map’, validation using ARM (Automated Requirements Measurement) tool, prioritization using ‘Kano Analysis’ and other methods that are useful for solutioning like ‘use cases’, ‘prototype’ and ‘storyboarding’ were covered. The event concluded with a session on Managing Requirements with bi-directional traceability. |

*Business Analysis session in progress*
### DELHI

**Bhai Mahavir Ji**, Former Governor of MP, Raizada B.D. Bali, President GMS, Dr. Rattan K. Datta, President, GAMS and other renowned speakers


**12-14 December, 2010**: "Mathematics in Development of ICT and Allied Applications"

This was a three-days national conference of Gwalior Academi of Mathematical Sciences organized by MERIT and supported by CSI Delhi chapter. Its objective was to bring together experts and research workers in Mathematical Modelling of various features of physical sciences including biosciences.

“Chief Guest, Bhai Mahavir Ji, emphasized on the role of ethics in scientific development. Guest of Honour Raizada B.D. Bali, President GMS, underlined the need of funding and supporting the Youth in their quest for research & discoveries for progress. He also took the opportunity to inform the participants the history of sacrifice of Mohylas. Dr. Rattan K Datta, President, GAMS deliberated on the theme of the event, and explained the impact the event would have in developing strong multidisciplinary research groups.

The conference witnessed academic contribution of 12 Keynote Talks and 60 multidisciplinary research papers spread across four technical sessions.”

### HYDERABAD

**Prof. P Thrimurthy, President-CSI addressing GNI Students and Staff on e-Governance**

Mr. I L Narasimha Rao from Aurora, Vice Chairman, CSI, Hyderabad chapter and the program coordinator Prof. P Thrimurthy

**4 September 2010**: “e-Governance and its Applications”

While addressing the students and staff members of Guru Nanak Institution, Prof. Thrimurthy spoke about some e-governance projects that can be undertaken by the students in an incubation centre, which can have multiplier effect.

**Editor’s Choice**: E-Governance is the use of a range of modern Information and Communication Technologies such as Internet, Local Area Networks, mobiles etc. by Government to improve the effectiveness, efficiency and service delivery and to promote democracy.

**Courtesy**: [http://www.it.iitb.ac.in/~prathabk/egovernance/egov.html](http://www.it.iitb.ac.in/~prathabk/egovernance/egov.html)

Mr. I L Narasimha Rao from Aurora, Vice Chairman, CSI, Hyderabad chapter and the program coordinator Prof. P Thrimurthy

**1 October 2010**: “Region V Student Branch Co-ordinators Meet”

**Organized in association with CDAC Bangalore**

**11-13 October 2010**: 3-days training program on “PKI Outreach Program (POP)”

**Organized in association with CDAC Hyderabad**

**18 December 2010**: Workshop on “Information Security Awareness”

**19 December 2010**: One-day program on “Project Development”

Dr. Prem Chand gave an inspirational talk on how to plan a project. Ms. Neela Sudhindranath spoke on SDLC. Dr. Ramchandran explained the essentials of documentation. Mr. Alosh Bennett made a presentation on Implementation and Testing. Prof. Sandeep Rawat spoke about the best practices.

**JAIPUR**

**Prof. H R Vishwakarma**

**23 September 2010**: “Revival of Jaipur Chapter”

Members Meeting of CSI - Jaipur Chapter was held under the Chairmanship of Hon. Secretary, CSI, Prof. H R Vishwakarma and organized by SIG-WNs, CSI and Udaipur Chapter. Prof. H R Vishwakarma welcomed the CSI Members who attended the meeting, for displaying keen interest in the revival of Jaipur Chapter. He expressed his profound gratitude to Dr. Dharm Singh, Convener SIG-WNs, and SGVU authorities especially Naveen Hemrajani, Vice-Principal, Engineering, Dinesh Goyal, HoD, CSE, SGVU, Jaipur, Bright Keswani, HOD.CA, SGVU and Uttam Sharma, RNS Infotech and others who motivate to join the CSI and 98 new Members joined CSI. Varun Bhatnagar, Kuldeep Singh, Swarnath, Savita Shiwani and Manju Vyas were asked to organize seminars on Security, Wired and Wireless Networks regularly for updating knowledge.

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**As soon as questions of will or decision or reason or choice of action arise, human science is at a loss.**

30 October 2010: One-day workshop on “Data Mining”

Workshop had two sessions. Morning session started with a topic on top ten recent innovations of data mining. Various topics like Developing a Unifying Theory of Data Mining, Scaling Up for High Dimensional Data and High Speed Streams, Sequential and Time Series Data, Mining Complex Knowledge from Complex Data, Data Mining in a Network Setting, Distributed Data Mining and Mining Multi-agent Data, Data Mining for Biological and Environmental Problems, Datamining-Process Related Problems, Security, Privacy and Data Integrity, Dealing with Non-static, Unbalanced and Cost-sensitive Data were discussed in the first session. The afternoon session covered topics top ten data mining algorithms including K-Means, Support Vector Machines, the Apriori, Page rank, AdaBoost, Nearest Neighbor Classification, Naive Bayes and CART.

LUCKNOW

13 December 2010: “Meeting Customer’s Aspirations in the ever changing Information Technology Market”

“Lucknow needs to work big time to embrace an IT culture in every walk of life. Computer usage has become a determinant of the ‘progress quotient’ of citizens of a geographical area. While children of Lucknow have shown a phenomenal increase in acquiring computer knowledge, adults still lag behind a bit vis-a-vis metro cities in India.” These views were expressed by Mr. M D Agrawal, Head of IT, Bharat Petroleum & President Elect, CSI.

Mr. Agrawal further added that the ‘digital divide’ among computer literates and illiterates needs to be effectively bridged in this part of the country. While appreciating e-governance initiatives of UP Government, he emphasized the need to increase its penetration all across the state specially in the government-citizen interface applications. He said that e-governance actually gives an opportunity to the government to re-invent itself and become a true friend of citizens across the state with applications commencing from the birth and covering education, healthcare, licenses, approvals, returns, taxes, salary, retirement and pension.

UDAIPUR

18 September 2010: “Open House Session”

Open House Session was held by Udaipur Chapter and SIG-WNs. Session was followed by a panel discussion on “Role of CSI: Issue and Challenges”. Prof. Vishwakarma invited suggestions and comments to deliver CSI services more effectively. After deliberations in the Session, following recommendations were unanimously proposed: To establish CSI as a leading society in the field of academia, it is essential that CSI has its own Research Publications like Conference Proceedings, Journals, etc., at the standards, which are recognized globally at par with Springer, IEEE, etc. This will help create a pool of leading researchers associated with CSI.

VISAKHAPATNAM

10 December 2010: “CSI Awards for Meritorious Students”

Chapter constituted CSI Awards to Meritorious Students (Toppers of University) marks aggregated upto third Year in CSE & IT courses of Engineering, which come under Visakhapatnam chapter viz. Andhra Univesity, GITAM University and JNT University from this year onwards (2010-2011). The purpose of awards is to create IT awareness and to encourage students and motivate them to join CSI. The award consists of a cash incentive of ₹ 10,000/- Memento and a Citation. These awards will be given every year during the Annual Student Convention and this year it was given on 10th Dec. 2010 during inauguration of 1st AP State Student convention at Visakhapatnam.

From this year onwards Visakhapatnam Chapter also established Best Performance Awards to Student Branches to encourage the branches. Six branches received awards for the year 2009-10.
# Student Branches


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<td><strong>AESICS, AHMEDABAD</strong></td>
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<tr>
<td>Experts from TCS</td>
<td>Career counselling by TCS was organized for final year MCA and BCA students to provide counseling on different career opportunities available in IT infrastructure management and services in TCS and other leading IT companies.</td>
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<tr>
<td>Event coordinators were Mr. Aniruddhsinh Parmar, Ms. Kunjal Gajjar, Mr. Sandeep Vasant and Mr. Vinay Vachharajani. Complementary gifts were provided by Lions Club of Ahmedabad South.</td>
<td>5 October 2010: “Blood Donation Camp”</td>
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<td>Prof. (Dr.) Mehul Raval, DA-IIICT and Chair, Student Activity, IEEE Gujarat Section</td>
<td>This was organized in association with Indian Red Cross Society as a part of a World Peace Day Celebration. Students, faculty and staff members participated with full enthusiasm in this event and donated 59 bottles of blood for this noble cause.</td>
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<td>Mr. Pratik Munshi, Assistant Professor, AESICS and Mr. Chittesh Maheshwari, Imagination Learning Systems Pvt. Ltd.</td>
<td>19 October 2010: Expert lecture on “Digital Image Forensics”</td>
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<td>Prof. Sandeep Vasant, AESICS and Mr. Piyush Bhatt, Project Manager, Juriscape Legal Research Pvt. Ltd.</td>
<td>29 November 2010: Seminar on “Enterprise Resource Planning”</td>
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<td>Dr. Nilay Yajnik, Professor and Area Chairperson - Information Systems, NMIMS, Mumbai</td>
<td>“Mr. Pratik Munshi, in his session, covered basic topics in ERP like history, basic ERP concepts, risks and benefits of ERP, ERP implementation issues, business modules and the ERP market with real life examples. Mr Chittesh Maheshwari started his session by explaining the myths of ERP and integrated learning and campus management solution.”</td>
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<td>Dr. Nilay Yajnik, Professor and Area Chairperson - Information Systems, NMIMS, Mumbai</td>
<td>14 December 2010: Seminar on “Beyond ERP”</td>
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<td>The seminar was organized to provide exposure to students about ERP and recent developments and emerging trends in next generation ERP systems (ERP 2.0).</td>
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**Editor’s Choice:** Traditional Enterprise Resource Planning (ERP) systems were developed to automate and integrate business functions on an operational or transactional level. They focused purely on internal processes. However, there is a need to manage not only operational processes but also corporate performance and strategic management-related processes across functions, geographies, and lines of business. Faced with this situation, corporate bosses are looking beyond ERP and other transactional applications for solutions that will help them manage their businesses more effectively.


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**AMSSOI, HYDERABAD**

D Sowjanya Latha, Reader, AMSSOI, Ms K Kavita Prashnathi, Lecturer, AMSSOI and Ms Taranum, Lecturer and Student Counselor, CSI-AMSSOI Student Branch

15 December 2010: “Inverse Quiz”

“Four teams, named BlakBerry, Nokiya, SAMSANG and Spise participated in the quiz and made the session interactive. The participants created questions, which were evaluated by Ms. Kavita Prashnathi, Lecturer, AMSSOI.

The questions were judged depending on the creativity of the participants, their understanding and analysis of the concept and representation.”
**ANURADHA ENGINEERING COLLEGE, CHIKHLI, BULDHANA, MAHARASHTRA**

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<th>Date</th>
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<tr>
<td>6 September 2010</td>
<td>Speech on “Prospects and Benefits of Professional Societies”</td>
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<td>This speech was organized on the day when CSI Student branch was formally</td>
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<td>established.</td>
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**EXCELL COLLEGE OF ENGINEERING FOR WOMEN, KOMARPALAYAM**

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<th>Date</th>
<th>Event/Activity</th>
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<tr>
<td>4-5 October 2010</td>
<td>Faculty seminar on “Synthesized Output for Dysphonic Signal using Speech</td>
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<td>Processing Technique”</td>
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<td>The topic covered a scheme that aims to produce synthesized output signal which</td>
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<td>is generated using the dysphonic speech signal.</td>
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<td>15 December 2010</td>
<td>Guest lecture on “Multimedia and its Applications in IT Industries”</td>
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<td>Speaker discussed 2D and 3D Graphics and Animation Softwares.</td>
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<td>22 December 2010</td>
<td>Faculty seminar on “Overview of Biometrics”</td>
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<td>The topic covered requirement of Biometrics, accepted Biometrics, its application</td>
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<td>and comparison of different Biometric Technologies.</td>
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<tr>
<td>23 December 2010</td>
<td>Faculty seminar on “Design of Personalize Domain Specific Web Crawler”</td>
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<td>Web crawler make easy of the user search process and it will retrieved user</td>
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<td>relevant information alone.</td>
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**MEDI-CAPS INSTITUTE OF TECHNOLOGY AND MANAGEMENT, INDORE**

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<th>Date</th>
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<tr>
<td>19 - 20 November 2010</td>
<td>Two-days conference on “Emerging Trends in Computing and Communication”</td>
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In the article Harnessing Green IT: Principles and Practices, San Murugesan defines the field of green computing as “the study and practice of designing, manufacturing, using, and disposing of computers, servers, and associated subsystems — such as monitors, printers, storage devices, and networking and communications systems — efficiently and effectively with minimal or no impact on the environment.” Murugesan lays out four paths along which he believes the environmental effects of computing should be addressed: Green use, green disposal, green design, and green manufacturing.

Two-days conference - ETCC2010 - in progress

"Dr. P K Sen emphasized on the need of research in academics. He said that we can be a super power if knowledge is disseminated to real nation builders. He predominantly emphasized on the development scenarios as tri-state of multistage behavior of technology and this is going to bring new dimensions for the advancements. The key note address was given by Dr. Chande who spoke on Paradigm Shift. He related the current developments with the urge of change that has come like a revolution in the IT Industry. From the early computers to smart iphones, technology is reaching the end users, which defines success” said Dr. Chande.

Expert talk on Dynamic ERP was taken by Mr. Prateek Mathur while Mr. Rajmohan spoke on Web Security- issues and challenges. Mr. Gunjan Agrawal spoke on e-Convenience. it was followed by the brain storming sessions of Dr. N.S. Choudhari on Polynomial Algorithm for NP-Complete problems - one of the seven biggest open problems of the century. Dr. Manohar Chandwani spoke on Knowledge Management and Dr. Maya Ingle discussed Emotional Computing.

DR. MGR UNIVERSITY, CHENNAI

Mr. Na Vijayashankar, Cyber Crime Consultant, Mr. Vijaya Kumar, Karur Vysya Bank, Mr. Zaki Quereshey, Founder & Chairman, E2 Labs Information LTD, Mr. A Ganesan Chairman IETE, DGM BSNL (Retd).

18 December 2010 : Workshop on “Frauds and Crime in Digital World”

“Four speakers respectively spoke on following topics - Various cyber crimes and how the victims can be legally protected through the laws of cyber act, Detailed discussion on Frauds in Financial Services and how they can be avoided, Research in the field of cyber crime and Eavesdropping in Wireless networks.”

Editor's Choice : With increased availability of intelligent electronic resources, a new form of criminal activity has taken shape, which takes advantage of these resources for unlawful purposes. This has not only posed a challenge for law enforcing agencies but have also given rise to new disciplines such as digital forensics.

MUTHAYAMMAL ENGINEERING COLLEGE, RASIPURAM

Mr. S Baskar, Chief Executive, LinuXpert Systems and Mr. K Baskar, Independent Trainer, LinuXpert Systems

14-16 December 2010 : Three-days faculty development program on “Free / Open Source Source Software”

On the first day Mr. Bhaskar gave demo of how to install Linux on the system and how to add new packages in it. Later, he gave demo about Kernel mode, User mode and development with Linux. On the second day, practice was given for working with strings, metadata, PHP, data types, operators, functions, arrays, file handling and data storage. On the third day, demo and practice was given related to PERL and PYTHON.

NEC, KOVILPATTI

Mr. N Muthu Vinoth Kumar, Final CSE and Mrs. V Vasantha, Senior Lecturer/ IT

13 to 19 October 2010 : “Fast Track HTML - Web Designing Course”

The course was for 2nd and 3rd year IT and CSE students. The topics were: HTML Basics, Lists, Tables, Frame, Forms and CSS.

Dr. D Manimegalai, Head of IT, Mrs. V Vasantha, CSI Student Counselor and CSI Staff Coordinators Mrs. Stella Inba Mary, Lecturer CSE Department, Mr. J Jerat Julus, Lecturer IT Department.

28 October 2010 : “Technical Debate Contest”

The contest was for 2nd year IT and CSE students. The topics were:
1. Computerization boon or bane.
2. Virtual classroom Vs Ordinary classroom.
3. Evolution or Creation
4. Education or Experience
5. Youth Vs Ex-Youth

Dr. K G Srinivasagan, Professor & Head CSE PG

30 October 2010 : Motivational seminar on “Power of Projects”

Dr. Srinivasagan stressed upon the importance of projects. He explained the developmental steps of a project and motivated students to develop projects, which meet the industrial expectations.
24 December 2010: “Elocution Competition”
The contest was held for Thoothukudi District Higher Secondary and Matriculation School Students. The topics for the Contest were more interesting as Tourism in India, Role of IT industry in Economic growth of India, Women Empowerment, and Spiritual Belief in India.

Price Distribution (L to R) Ms. V Vasanth, Dr. K S K Chockalingam, Dr. N S Marimuthu, Dr. D Manimegalai

OPJIT, RAIGARH, C.G.
Mr. S. K. Agrawal, (Sr. Vice - President, Commercials & IT Head of Jindal Steel & Power Limited)

28 October 2010: “Inauguration of OPJIT CSI Student Branch”
A full day function was conducted and it included events such as like model presentation, poster making and quiz competition.

Editor’s Choice: It is often said that ‘Well begun is half done’. Inauguration is a formal function to mark the beginning. Although it is a mark of having achieved something, a real challenge lies ahead, which majority of CSI chapters and student branches have shown how to face successfully.

PIONEER INSTITUTE OF TECHNICAL STUDIES, INDORE
Madhav Datar, Gen. (Retd.), Indian Army, MCTE, Mhow and Dr. V S Karnik

29-30 November 2010: “TECHKNOWLEDGE-2010 - Software Development Contest & Paper Presentation Contest”
This was organized in association with HCL career development centre, Indore. Teams participating in software development contest submitted programs, which covered topics such as Web Browser, Network Security & Cryptography, Bulk SMS, Eywa-The Information System, Voice to Text etc. Application Suit for Mobile Phone for Remote Access to Personal Computer was declared winner.

THIAGRAJAR COLLEGE OF ENGINEERING, MADURAI
Mrs. M. Vijayalakshmi was staff co-ordinator.
Narasimman V, Srividya K were student co-ordinators

8 July 2010: “Puzzle Contest”
A puzzle contest was held to test ingenuity of students and to develop their skills in non-technical areas.

Muthukumaran B., Karpagalakshmi R. were student co-ordinators.

13 and 23 August 2010: “C Programming Contest”
A programming contest in C language was conducted for second and pre-final year students in two rounds - one round of objective questions and another round of practical test.

Guests in the Inaugural Session: (L to R) Dr. V K Jain, Dr. P K Jain, Mr. Madhav Datar, Dr. V S Karnik, Dr. Pawan Patni, C A Prashant Jain.

26 August 2010: “Crypt Analysis Contest”
A crypt analysis contest was held for second and pre-final year students where students learnt hands-on how to crack cryptic codes.

Editor’s Choice: Cryptanalysis (from the Greek kryptós, “hidden”, and analysein, “to loosen” or “to untie”) is the study of methods for obtaining the meaning of encrypted information, without access to the secret information that is normally required to do so. Typically, this involves knowing how the system works and finding a secret key. In non-technical language, this is the practice of codebreaking or cracking the code.

January 2011

ConFER-2011: The 4th National Conference on Education & Research
Date: 23-24 January, 2011
Hosted by: Shambhunath Institute of Engineering & Technology, Allahabad
Organized by: CSI Division V, Region-1 and Allahabad Chapter
For details contact: P J Mishra
E-mail: dean_top1948@yahoo.com, Mr. Zafar Aslam (e-mail: zafar.aslam@cmcltd.com)
Workshop on “Software Effort Estimation Using FPA”
Date: 23-24 January, 2011
Hosted by: Shambhunath Institute of Engineering & Technology, Allahabad
Organized by: CSI Division V, Region-1 and Allahabad Chapter
For details contact: Prof. P J Mishra
E-mail: dean_top1948@yahoo.com, Mr. Zafar Aslam (e-mail: zafar.aslam@cmcltd.com)

2nd International IT Summit - Confluence - The Next Generation Information Technology Summit
Date: 27th-28th January, 2011
Hosted by: Amity University Campus, Sector 125, Noida
For details contact: Ms. Sapna Sinha e-mail: confluence2011@amity.edu
E-mail: dean_top1948@yahoo.com, Mr. Zafar Aslam (e-mail: zafar.aslam@cmcltd.com)

Seminar on “Harnessing the Power of Social Networking Sites”
Date: 28th January, 2011
Organised by: CSI Mumbai Chapter
For details contact: info@csimumbai.org, csimumbai@vsnl.com
Hands-on Workshop on “Business Process Modelling with Unified Modelling Language” (28th-29th Jan.)

February 2011

NCCSE-2011: Second National Conference on Computational Science and Engineering
Date: 4-5, Feb 2011 at Kochi, India
Organised by: Department of Computer Science & CSI Student Branch, Rajagiri College of Social Sciences, Cochin in association with CSI Div. IV on Communications and Cochin Chapter
For details contact: Dr. P. X. Joseph, Conference Convener, Prof. & HOD, Department of Computer Science, Rajagiri College of Social Sciences, Rajagiri P.O, Kalamassery, Cochin - 683104, Kerala, India. Phone: Ph: 0484- 2555564, Email: px_joseph@yahoo.com or visit the website at: www.rajagiri.edu

25th National Convention of Computer Engineers and National Seminar on Networked Home Systems and Services (NHSS)
Date: 4-6, Feb 2011
Organised by: The Institutions of Engineers (India)
Hosted by: Udaipur Chapter

National Conference on Technology Driven Society (NCTDS 2010)
Date: 11-12 Feb. 2011
Hosted by: CSI Surat Chapter
Organized by: Uka Trasadia University, Shrimada Rajendra Institute of Management and Computer Application
For details contact: Dr. Narendra Burade naren@vareinfotech.com, nctds@srimca.edu.in

CONSEG-2011: International Conference on Software Engineering
Date: 17-19 February, 2011
Organized by: CSI Div. II (Software) and Bangalore Chapter
For details contact: Dr. Anirban Basu, anirbanbasu@qualityplusindia.com

Second International Conference on Emerging Applications of Information Technology (EAIT 2011)
Date: 18-20 February, 2011
Host by: Kolkata Chapter
For details contact: Mr. D P Sinha, csiea11@gmail.com

National Conference on Emerging Trends in Information Technology
Date: 24-25 February, 2011
Host by: Department of Computer Science & Engineering Institute of Engineering & Science, IPS Academy, Indore
For details contact: Anita mahajan, omumal8@gmail.com

March 2011

27th CSI National Student Convention
Date: 9-12, March 2011
Hosted by: IITM Gwalior
Organized by: CSI ITM Universe Student Branch and CSI Gwalior Chapter
For details contact: pallavikhatri.csitmituniverse.in, dshitoley@yahoo.com, dr.vipin.yangi@gmail.com

April 2011

Date: 8-9, Apr 2011 at Chennai
Organized by: Department of Electronics & Communications Engg., Aarupadai Veedu Institute of Technology, Vinayaka Missions University and supported by CSI Div. IV (Communication), IEE madras Section, IEEE COMSOC, IEEE CS, IETE, BESI().
For details contact: D Vijendra Babu, Conference Co-Chair, NCVESCOM-11, HOD & Associate Professor/ECE, Aarupadai Veedu Institute of Technology, Paityanoor-603104. Email: ncvescom2011@gmail.com Phone: +91 9443538245 or Mr. H.R. Mohan, Chair, Div II at hrmohan@gmail.com Website: www.avit.ac.in

July 2011

ACC-2011: International Conference on Advances in Computing and Communications
Date: 22-24, Jul 2011 at Kochi, India
Organized by: Rajagiri School of Engineering and Technology (RSET) in association with Computer Society of India (CSI), Div. IV & Cochin Chapter, The Institution of Electronics and Telecommunication Engineers (IETE), The Institution of Engineers (India) and Project Management Institute (PMI), Trivandrum, Kerala Chapter.
For details contact: Dr. Sabu M. Thampi, Conference Chair - ACC2011, Professor, Dept. of Computer Science & Engineering, Rajagiri School of Engineering and Technology, Rajagiri Valley, Kakkanad, Kochi 682 039, Kerala, INDIA. Email: acc2011rset@gmail.com Website: http://www.acc-raja.org

M.D Agrawal
Vice President & Chair, Conference Committee, CSI