NEWSLETTER

BITES

Board for IT Education Standards

VOLUME 31 – April 2012 Helping to Keep Karnataka at the forefront of IT

Guest Editorial

Sri Srikantan Moorthy
Senior VP and Head, Education & Research, Infosys

April 2012 : ICT and Sustainability

Mahatma Gandhi had said "The planet has everything for our need but not for our greed." The projected population growth and our current rate of usage of resources that the earth has, make it doubtful if our children and grand children will have enough for their need unless all of us do something about it.

Sustainability as a focus area is increasingly becoming more prevalent in both business and education. In the aftermath of the global economic downturn financial growth has become imperative. Social unrests have reiterated the need for equitable growth. Financial growth with environmental responsibility and social consciousness is the need of the hour.

Education has a big role to play in global sustainability. Social progress is not possible without education. Education is the catalyst for social and economic development. Engineers of tomorrow must be able to take up the grand challenges and find solutions to enhance the quality of human life.

Engineering education therefore must focus on creating these problem solvers for a Sustainable tomorrow. Engineers not only need to know the concepts well but also be able to apply those concepts in the context of the problems they will encounter. They will also need to be able to communicate and work well with multidisciplinary global teams. With personal integrity and a compassion for people and the planet, they must create innovative solutions that make the world a better place.

Technology, especially information and communication technology (ICT) is a critical element for building sustainable solutions. If we have to get better at leveraging natural resources we need to understand how we use them. We then need to reduce their usage if not eliminate usage in some cases. ICT can help in both of these areas. For example digital meters at the points of consumption of water or power can help understand usage. Transmitting these measurements through communication technology embedded in these devices can help in centrally monitoring usage and taking corrective steps. Automation of manual processes through the use of ICT can help reduce usage of resources. There are several ways in which ICT can be leveraged for sustainability such as:

- Process Automation – to increase transaction effectiveness and transparency
- Digitization – to reduce or eliminate paper usage – for example e-filing of Income Tax Returns; e-ticketing etc.,
- Measurement & Control – through the use of digital measurements, sensors and remote control
- Reporting – through centralized data collection facilitating action and better governance

Understanding the need to build sustainable solutions provides a unique opportunity for innovation. India provides a perfect ecosystem to build innovative solutions for tomorrow. This is an opportunity for engineering students to choose multi-disciplinary projects that address sustainability issues to not only demonstrate their understanding of concepts but also show case their innovative capabilities.

Srikantan Moorthy

From Chairman's Desk

Draft National Electronics Policy

The Union Ministry of Communications and Information Technology has recently announced the Draft National Electronics Policy - 2011. The policy envisions creating a globally competitive Electronic System Design and Manufacturing (ESDM) industry, including nano-electronics, to meet the country's needs and serve the international market. It is pointed out that the Electronics Industry, reported at USD 1.75 Trillion, is the largest and fastest growing manufacturing industry in the world.The demand in the Indian market was USD 45 Billion in 2008-09 and is expected to reach USD 400 Billion by 2020. "Domestic demand is expected to be driven by: growth in income levels leading to higher off-take of electronics products, automation demands of corporate sector and the government's focus on e-governance".

The vision to transform India into a global hub for electronics system design and manufacturing (ESDM) so as to meet the growing domestic and global demand faces many challenges – "infrastructure gap, tax structure, supply chain and logistics, inflexible labour laws, limited R&D focus, inadequate funding and limited value addition".

In the area of *Human Resource Development*, the challenge is "to work closely with Private Sector, Universities and other Institutions of learning and to design programs to ensure that adequate trained and skilled manpower is available to the industry by; (a) facilitating enhancement of the number of graduates and other skilled manpower by suitably increasing capacities in colleges/ITIs and Polytechnics through public and private sector investments;(b) supporting creation of capacities within academic institutions to enhance the production of adequate number of PhDs and post-graduates for supporting the growth of chip design and embedded software and board/hardware design industry in the country;(c) encouraging the setting up of skill-oriented courses and training programs for electronic designs along with hands-on laboratories enabling graduates from other disciplines to migrate to ESDM; (d) creating a specialized Institute for semiconductor design; (e) extending Special Manpower Development Program for Very Large Scale Integration (VLSI) chip design to include larger number of colleges and students leveraging the National Knowledge Network; (f) creating an institutional mechanism for the faculty development in various ESDM related subjects; and (g) collaborating with national and international institutions for development of new skills and courseware on latest manufacturing technologies and products in ESDM sector.

The major sectors for focus are identified to be : Cyber Security, Strategic Electronics, Automotive Electronics, Avionics, LED, Industrial Electronics, Medical Electronics, Solar Photo-voltaics, Information and Broadcasting, and handling of e-waste.

It is also proposed to rename The Department of Information Technology as *Department of Electronics and Information Technology* (DeitY)

Prof R Natarajan

BITES Faculty Development Workshop on

"Webservices, Concepts, Implementations and Cloud Computing"

Date: 28th January 2012
Venue: Canara Engineering College, Bantwal

The workshop Jointly organized by BITES and IBM at Canara College of Engineering was well attended with over 40 faculty members of various colleges from Mangalore, Bangalore & Hubli regions . The workshop started with an excellent introduction from the college vice-principal who clearly articulated the need for such technology workshops for the faculty members. This was followed by an address by Prahalad Rao (Executive Director – BITES), who explained about the BITES – IBM initiatives and the formation of Special Interest Groups with subject matter experts drawn from both Industry and Academia to work on innovative curriculum development and there by enable faculty and students to be in synch with the changing industry trends.

IBM conducted a workshop on WebServices and Cloud computing concepts for the faculty members at Canara college of engineering. The brief description on each of the session is outlined below:

WebServices concepts and Implementation:
Lohith Ravi from IBM started the day by taking the session on WebServices fundamentals. Lohith explained how technology evolved from the traditional client-server architecture to the era of remotely invoking and sharing of services across different domains, languages and operating systems. Lohith articulated the need of WebServices within the SOA context and WebServices plays a very important role in realizing the SOA solutions. This session was very well received by the faculty members and this was evident from the interactive discussions

Cloud Computing:
Lohitashwa Thygaraj presented this session on Cloud Computing. The whole industry is moving towards adopting Cloud, since Cloud is evolving as a new consumption and delivery model inspired by consumer Internet services. Cloud enables Self-service, Sourcing options & Economies-of-scale. This session on cloud computing opened a new window of thoughts and opportunities for the faculty members to explore and experiment further.

Round table discussion with Faculty members and IBM speakers:
The day was concluded with a round table discussion between the IBM speakers and faculty members. There were lots of questions and queries from the faculty members that were addressed by the IBM team. Two special interest groups one on web Services and other on cloud computing were created as an outcome of these discussions..

Guest Lecture on
"Emerging Trends and Applications in High Performance Computing"

Date: 2nd February 2012
Venue: PESIT, Bangalore
Resource: Prof. Ashok Srinivasan, Department of Computer science
Florida State University

These are exciting times in high performance computing. On one hand, new, massively parallel machines are being developed with hundreds of thousands of processors. Exascale machines (10^18 flop/s) are expected by the end of the decade with parallelism of the order of a billion simultaneous operations. Parallelism is also available at the desktop through multicore CPUs and GPU accelerators. On the other hand, new applications, with the potential for revolutionary advances in science and technology, require the enormous computational power promised by these machines. Prof. Srinivasan in his talk covered emerging trends in parallel hardware, applications that need them, difficulties that need to be overcome, and potential solutions.

The lecture began with a discussion on what exactly is a high-performance computer: its characteristics and architectural features in terms of CPU, Memory and Storage. Several examples of HPC machines built by US, Japan and Chinese companies were discussed. It was noted that HPCs are fast moving from esoteric research labs to solving real world applications with over 60% of the HPCs built being deployed to address problems like :

Earthquake Simulation: Simulation May Help Big Cities Develop Early Warning Systems
Hurricane Prediction: Can provide early warning about hurricanes its direction and speed of movement enabling more effective disaster management
Weather Modeling: can integrate high-resolution Earth-Systems models with satellite and other data; Multi disciplinary teams can share the data and work on integrated models

Biology and Medicine: Multi-scale modeling to understand complex interactions of biological processes; can result in better drug design and personalized medicine
Socio-Economic Modeling: Interdisciplinary work integrating science, economics, and human effects

The talk also covered the dominant architectural trends in the design of HPCs notably in the areas of faster computation, communication and storage. The lecture concluded with the challenges ahead of researchers in this important field of study.