



# CSI Communications

Knowledge Digest for IT Community

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# GREEN COMPUTING



## Cover Story

**Green Engineering: Future  
Internet Perspective 10**

## Cover Story

**Green Computing 18**

## Article

**The Concept of Software Recycle 20**

## Article

**Creating a DevOps Methodology 24**

## Security Corner

**Green Computing and Security  
Issues 31**

# Know Your CSI



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 – an individual.

 – 2 are friends.

 – 3 is company.

 – more than 3 makes a society. The arrangement of these elements makes the letter 'C' connoting 'Computer Society of India'.

 – the negative space inside the letter 'C' connotes an arrow - the feeding-in of information or receiving information from a computer.

## IT for masses

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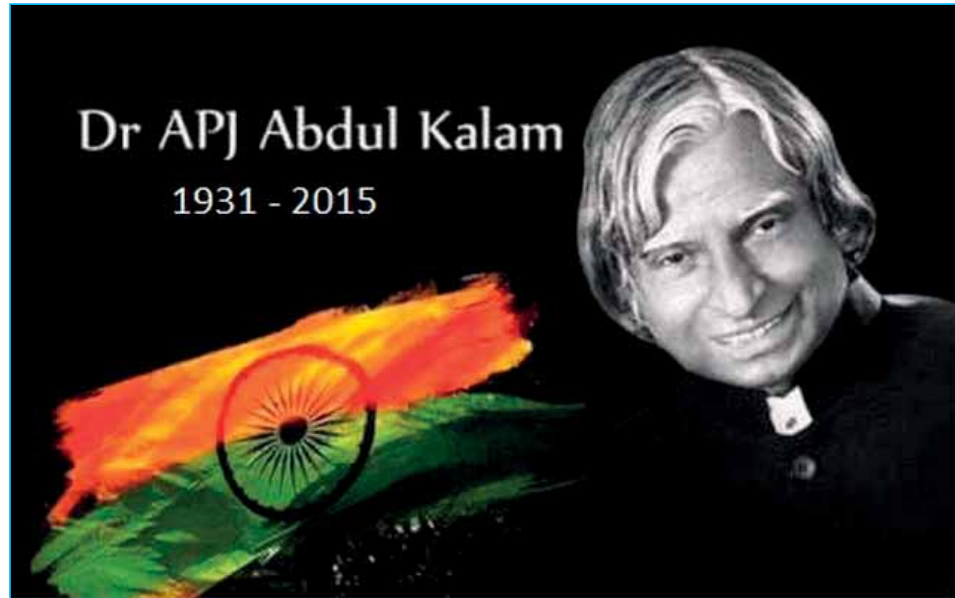
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*"To succeed in your mission, you must have single-minded devotion to your goal."*

*CSI family salutes to the Hero of the Nation*



# A Tribute to Dr. APJ Abdul Kalam

Avul Pakir Jainulabdeen Abdul Kalam was born on 15 October 1931 in Rameswaram, Ramanathapuram District, Tamil Nadu. Kalam spent the next four decades as a scientist and science administrator, mainly at the Defence Research and Development Organisation (DRDO) and Indian Space Research Organization (ISRO) after studying physics and aerospace engineering after graduating from Madras Institute of Technology.

After graduating from the Madras Institute of Technology in 1960, Kalam joined the Aeronautical Development Establishment of the Defence Research and Development Organization (DRDO) as a Scientist. He started his career by designing a small helicopter for the Indian Army, but remained unconvinced by his choice of a job at DRDO. In 1969, Kalam was transferred to the Indian Space Research Organization (ISRO) where he was the project director of India's first Satellite Launch Vehicle (SLV-III) which successfully deployed the Rohini satellite in near-earth orbit in July 1980. Kalam had first started work on an expandable rocket project independently at DRDO in 1965.

Kalam was the chief executive for Integrated Guided Missile Development Programme (IGMDP) of Defence Research and Development Organization (DRDO) who played a major part in developing many missiles under the mission including Agni, an intermediate range ballistic missile and Prithvi, the tactical surface-to-surface missile.



For his contribution to the missile programme, he was awarded with Bharat Ratna, the highest civilian award in 1997. He was also awarded Padma Bhushan in 1981 and Padma Vibhushan in 1990.

With his involvement in India's civilian space program and military missile development efforts, he thus came to be known as the **"Missile Man of India"** for his work on the development of ballistic missile and launch vehicle technology.

A vegetarian bachelor, Kalam was quoted as saying that like most of the technology he spearheaded, he himself was "Made in India", having never been trained abroad.

Kalam succeeded K R Narayanan and served a full five-year term from 25 July 2002 until 25 July 2007 after he won the Presidential elections which was a highly one-sided contest with Lakshmi Sahgal, a revolutionary of the Indian Independence movement, as his rival.



Post-presidency, Kalam worked as a visiting professor at Indian Institute of Management, Shillong, Ahmedabad and Indore and several research and academic institutions across the country and abroad.

He was passionately advocating the cause of IT Education & Research for the youth and was extremely popular amongst the students. CSI officials were fortunate to have multiple occasions of interaction with him and take his guidance and blessing, from time to time. One such occasion was created by Bharati Vidyapeeth, New Delhi, in association with Computer Society of India (CSI), during which Prof. M. N. Hoda, Chairman (Division-I) & Mr. R. K. Vyas, the then Vice President (Region-1) & Hony. Treasurer had an opportunity to interact and apprise him about the activities and initiatives undertaken by of CSI. Much earlier, the veteran members of CSI, Prof. U. K. Singh and Prof. A. K. Nayak had also a wide range of discussions with him about IT development of the country in general and role of CSI in particular.



He authored several books with the 'Wings of Fire', 'India 2020' and 'Ignited Minds' being the most read best-sellers.

On the evening of 27 July 2015, Kalam collapsed at around 6:30 p.m. while delivering a lecture on "The Livable Planet Earth" at the Indian Institute of Management (IIM), Shillong. He was rushed to Bethania Hospital in a critical condition and was placed in the intensive care unit, but was confirmed dead because of a massive cardiac arrest. As teaching was his passion, he desired to be known as a Teacher, rather than being known as a Scientist, Missile Man, President, etc. God fulfilled his desire and he took his last breath, while delivering lecture to students at IIM, Shilong. CSI fraternity take the opportunity to salute this "Anmol Rattan" of the country, who was not only an icon of pride for the entire nation but also inspired the humanity. Great poet Allama Iqbal has rightly said that:-

*"Hazaron saal nargis apni benoori pe roti hai  
badi mushkil se hota hai chaman mein koi dida war paida"*



# CSI Communications Contents



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**Chief Editor**  
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<b>10</b>	<b>Cover Story</b> Green Engineering: Future Internet Perspective <i>Vinod V. Kimbahune, Arvind V. Deshpande and Parikshit N. Mahalle</i>	<b>22</b>	Flipped Course – A Go Free and Go Green Approach <i>Parkavi A. and Dr. N. Vetrivelan</i>
<b>12</b>	Green ICT in Higher Education: the Next Frontier for Sustainable Growth <i>Kavita Suryawanshi and Sameer Narkhede</i>	<b>24</b>	Creating a DevOps Methodology <i>Rajan Janjani and Shriniwas Sathe</i>
<b>14</b>	Green Computing - Saving the Environment with Intelligent use of Computing <i>Sukhpreet Kaur and Dr. Kanwalvir Singh Dhindsa</i>	<b>30</b>	<b>Practitioner Workbench</b> Programming.Tips() » Taking Screenshots in Java <i>Vijendra S Bhadhouria and Rajesh K Shukla</i>
<b>17</b>	Measures for Green Initiatives <i>M. Chandrakumar Peter and A. B. Karthick Anand Babu</i>	<b>31</b>	<b>Security Corner</b> Green Computing and Security Issues <i>Anupam Tiwari</i>
<b>18</b>	Green Computing <i>Vijay Kumar Vishwakarma</i>	<b>33</b>	Cyber Security and Social Media <i>Hardik A. Gohel</i>
<b>20</b>	<b>Articles</b> The Concept of Software Recycle <i>Sumith Kumar Puri</i>		

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## PLUS

<b>Brain Teaser</b> <i>Dr. Durgesh Kumar Mishra</i>	37
<b>Reports</b>	38
<b>CSI Membership Form</b>	42
<b>Student Branches News</b>	48

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Dear Fellow CSI Members,

India has lost a great personality, scientific visionary & Missile man Bharat Ratna, Dr. A.P. J. Abdul Kalam, the past president of republic India. The gap created by this loss cannot be fulfilled. The members of the Computer Society of India express their deep condolences and pay homage to the great son of India.

India is moving towards Digital India while celebrating its Independence day this month. While progressing towards being digital, it is very much necessary to take care of our environment. Green computing as a concept indicates environment consciousness in computer industry. It is a philosophy of caring for our Mother Earth, our Environment and Eco system. During this development age, we have become so busy in garnering profits that we seem to have forgotten our moral and social responsibilities towards our own Mother Nature. To continue in maintaining with our success story, it is high time for us to go really green and equally the IT industries should take effective initiative for green computing. Traditionally there is a lack of eco-awareness in IT industries. Societies, technologists and researchers should effort collectively to perform interdisciplinary research and crate social awareness about green computing. There is a need of development of technologies which are environment friendly.

Keeping in mind the importance of Green computing, the publication committee of Computer Society of India selected the theme of CSI Communications (The Knowledge Digest for IT Community) August 2015 issue as "Green Computing".

In first cover story of the issue " Green Engineering: Future Internet Perspective", V. V. Kimbahune, A. V. Deshpande and P. N. Mahalle have discussed the green computing concept in terms of internet technologies. Next cover story "Green ICT in Higher Education: the Next Frontier for Sustainable Growth" by K. Suryawanshi and S. Narkhede gives various aspects of Green ICT to achieve sustainable growth. The third cover story by S. Kaur and K. S. Dhindsa elaborates Green Computing with current issues and the intelligence use of computing through best tools and techniques. M. C. Peter and A. B. K.A. Babu have given the Ten Commandments towards Green initiatives are for raising public awareness and for sustainable energy in their article "Measures for Green Initiatives". Last cover story "Green Computing" by V. K. Vishwakarma has given some basic ideas to implement Green Computing.

An article " The Concept of Software Recycle : Retrofitting Older Generation (Used) Components with Newer Components" by S. K. Puri has elaborated the idea of Software Recycle, for resource efficient, green and scalable development lifecycle. Another article "Flipped Course - A Go Free and Go Green Approach" by Parkavi A. and N. Vetrivelan suggests suggest few methodologies to deliver the course using online resources which are freely accessible and reduce the paper usages.

A white paper "Creating a DevOps Methodology" by R. Janjani and S. Sathe provides an insight into implementing a successful DevOps methodology.

In security corner, we have selected an article "Green Computing and Security Issues" by A. Tiwari. This article discusses the security issues related to green computing technologies. Next article "Cyber Security and Social Media" by H. A. Gohel gives the way to protect our privacy on social media.

This issue also contains an exclusive interview with Mr. Rajendra Deshpande, CIO, Global Services Division, Serco (SGS).

Calendar of events and CSI activities reports are also included along with CSI membership forms in this issue.

I take this opportunity to extend my sincere thanks to Dr. Vipin Tyagi, Guest Editor for bringing this issue successfully with rich and quality content. I believe this issue shall be successful in creating awareness in society and technologists about green computing due to the combined efforts of the editorial team and all the contributors for providing information and ideas related to Green Computing.

I extend my gratitude to the entire EXECCOM and particularly to Prof. M. N. Hoda and Dr. D. K. Mishra for their support in bringing this issue successfully.

On behalf of publication committee, I express my sincere thanks to all authors and reviewers for their contribution to this issue.

Finally, we look forward to receive the feedback, contribution, criticism, suggestions from our esteemed members and readers at [csic@csi-india.org](mailto:csic@csi-india.org).

**Prof. A.K. Nayak**

**Chief Editor**

# President's Message

**Prof. Bipin Mehta**

From : President's Desk:: president@csi-india.org  
Subject : President's Message  
Date : 1st August 2015

**Dear Members,**

It is sad to know about the demise of former President Dr. A. P. J. Abdul Kalam, recipient of highest civilian award Bharat Ratna, known for his simplicity, honesty, sincerity and dedication to Nation. After completing his term as 11th President of India, he contributed to education, writing and public service till he breathe last. His books "Wings of Fire", "My Journey" and "Ignited Minds – Unleashing the power within India" became most popular in India and Abroad. Our Prime Minister Shri Narendra Modi has said in his tribute "Bharat has lost a Ratna but the light from this jewel will guide us towards A.P.J. Abdul Kalam's dream destination". We will miss a selfless and a passionate performer in the years to come. May his soul rest in eternal peace

I was invited as Chief Guest for the "2nd International Conference on Computer and Communication Technologies" organized by CMR Technical Campus in association with CSI Division-V (Education & Research) and Springer as a publication partner from 24th – 26th July, 2015 at Hyderabad. The conference was inaugurated by Shri Bandaru Dattatraye, Hon'ble Minister of State, Labour & Employment, Government of India on 25th July, 2015 in the presence of more than 1000 members in the audience. In his speech, Shri Bandaru Dattatraye described many initiative of the Government of India for National Skill Development and National Career Services. I briefed the audience about CSI, its motto "IT for Masses", various initiatives for research and training, e- Governance awards etc.

In the conference, quality of papers presented was remarkably good. The event was well organized by the team of Dr. Suresh Satapathy, Chairman, CSI Division-V; Dr. A. Raji Reddy, Director, CMR Technical Campus ; Dr. K. Srujan Raju, Professor & Head, CSE Department, CMR Technical Campus and Mr. Aninda Bose, Editor-Hard Sciences- Springer (India) Pvt. Ltd. Shri Gopal Reddy, Chairman, CMR Technical Campus extended his co-operation to make this conference a success.

It is pleasant news that 211 school teams are registered for the CSI Young Talent Search in Computer Programming Contest 2015 for SEARCC -2015. The first level regional competition was held in 21 centers across the country on 26th July 2015 with active support from local Chapters. The final competition will be held at Chennai on 30th August 2015. Dr Suresh Satapathy, Chairman, CSI Division-V is a



coordinator for SEARCC 2015 competition. My thanks to Dr. Satapathy, staff members at Education Directorate, Chapters and participating Schools for their efforts to make this event a success. It is heartening to acknowledge that our institutional member Rajalakshmi Engineering College, Chennai is supporting this event for hosting the final competition for the past 15 years without any cost to CSI. Prof. Kumar, former Chairman, CSI Chennai Chapter is involved in this activity for about 10 years.

There is good news for Computer Sciences students. It is reported by "IT World" that they are in demand. A new survey reinforces the notion that a computer science degree is a smart career move. Computer Science majors have some of the best job prospects. I am sure our student members will not miss the opportunity to make the bright career in this ever demanding field.

I express a deep condolence on the sad demise of Prof. S.G. Shah. Prof. S. G. Shah (75), former Regional Vice President, CSI (Region 3) during 2009-2013 and a renowned academician passed away on 24th April, 2015. The passing away of this veteran is a great loss to CSI, academia and society in general.

With best wishes,

**Bipin V. Mehta**



# Vice President's Column

Prof. Dr. Anirban Basu, Vice President



We are continuing our efforts in improving transparency and in bringing facts to the knowledge of our members and on putting systems in place. The work is going on in spite of hindrances by some senior members who are trying all possible means to thwart our efforts.

1. CSI Website is being developed and gradually links and data are being proliferated. It is expected to be fully operational in the next few months.
2. Regional and State Student Coordinators have been assigned the tasks of improving our reach in Educational Institutions. They will work with CSI Education Directorate in Chennai for the purpose.
3. Membership development at all levels is being given thrust and forms have been redesigned.
4. We are also trying for corporate membership and members have been requested to work on this.
5. CSI Communications is now effective in communicating with our Members. Complaints about non receipt of hard copies, is being looked into and reasons are being found out.
6. There has been a necessity to bring in discipline in all respects in CSI. Nomination Committee is working on ensuring that elections are held at the Chapter level in time and announced as per schedule.
7. Every month, an interview with a senior IT professional is being organized and the summary is being published in CSIC. This is being done to bring CSI closer to Industry.
8. Efforts are on to strengthen the Special Interest Groups (SIGs) formed few years back but lamenting due to lack of support.
9. Various training programs and conferences/workshops are being held. A Two days Training program on Embedded System Design using MSP 430 was organized at CSI- Education Directorate Chennai on July 24 and 25 in association with NIELIT of Govt. of India attended by 27 participants.
10. A three days Workshop on Big Data Analytics is being organized by SIG-Big Data Analytics on three consecutive Saturdays starting July 25.
11. A new list of **Distinguished Speakers** is being prepared by nomination and by selection from the applications.

Overall the new ExecCom of CSI is working on growth of CSI with the cooperation of all our Members.

Best wishes,

**Dr. Anirban Basu**



## Meeting with Mr. Rajendra Deshpande, CIO, Global Services Division, Serco (SGS)

Mr. Deshpande, an industry veteran with over two decades of experience in the IT & ITeS industry, currently the Chief Information Officer at Serco's Global Services Division visited CSI-HQ on July 6, 2015 and met Dr. Anirban Basu, Vice President, CSI, Mr. Ravikiran Mankikar, CSI Division III Chair and Prof. A. K. Nayak, Chairman, CSI Publication Committee and shared his views on a variety of topics. The discussion is summarized below.

A passionate technology enthusiast with 20+ years of experience, Mr. Deshpande loves to deliberate and create business value through the innovative use of IT. Serco is an international service company, which combines commercial know-how with a deep public service ethos. Around the world, they improve essential services by managing people, processes, technology and assets more effectively and advise policy makers, design innovative solutions, integrate systems and - most of all - deliver to the public. Serco is the third largest BPO player in India and has been a game changer in the BPO landscape. Their Global BPO business has more than 60,000 employees over 100 locations, with a presence in 13 countries providing the complete spectrum of business services to customers in the public and private sector around the world.



### 1. What is the present IT scene in the country?

The Indian IT-BPM Industry is looking very promising in terms of growth, revenue and employment opportunities. The foundation of this progress has been laid up by constant developments and extraordinary innovations. The industry has clocked revenues of USD 146 billion in FY 15, so far. In FY16, NASSCOM expects the industry to add revenues of USD 20 billion to the existing industry revenues of USD 146 billion. E-commerce has played a major role in fuelling the growth of the domestic market, which grew by 14 per cent in FY 2015. NASSCOM expects domestic market to grow by 15 to 17 per cent in FY 2016. All these figures point towards constant growth for the IT industry in the coming years.

### 2. How do you see the growth of IT Industry and employment of Indian IT professionals?

India's IT Industry will definitely open up innumerable opportunities for IT professionals in the future. Technological innovations, automation of processes, focus on BPaaS portfolio and digitization are fuelling growth in this industry. The Indian IT-BPM sector is one of the largest employers in the country, directly employing about 3.5 million professionals and adding 2,30,000 employees year on year. Almost 89,000 jobs have been created in the last quarter of FY 14-15 and there's more scope for it to grow. Additionally, the government's policies to promote BPOs in Tier 2 and Tier 3 cities will be a major factor for driving employment. Such massive opportunities will lead to the requirement of skilled employees who can function within streamlined processes. We believe there are innumerable employment opportunities coming up in the future in the IT sector and it is important that IT professionals are given the chance to get trained with the right set of skills.

### 3. What are plans of SGS in terms of technology development and creating more job opportunities?

SMAC has emerged as one of the key elements that has added to the growth of the IT industry in the country. With social media, mobility, analytics and cloud gradually becoming essential for business efficacy, there will be huge demand for skilled resources in the future. BPOs can deliver products and services around SMAC that can deliver competitive advantage for their customers. In terms of technology, SGS is focussed on bringing up mobility, in house cloud and optimise labour intensive back office functions that are utilising rapidly advancing robotics process automation technologies. These fields have huge growth potential and are sure to generate demand for skilled professionals in the coming years.

### 4. What in your opinion can be the role of CSI in Indian IT scenario?

The Computer Society of India is a recognised government organisation that can play an instrumental role in the Indian IT scenario. CSI being the first and the largest body of computer professionals in India needs to act as an intermediate in a more effective way by not only getting computer professionals together but also taking additional efforts to share the IT advancement and innovations with the non-members. With the innumerable opportunities that the IT and ITeS industry will present in the coming future, CSI can play a pivotal role in bringing together the industry and academia to ensure that skill demand for the future is met effectively.

CSI works closely with industry associations, government bodies and academia and facilitates research, knowledge sharing, learning and career enhancement for all categories of IT professionals, while simultaneously inspiring and nurturing new entrants into the industry and helping them to integrate into the IT community. It also mentors and promotes a culture of innovation and entrepreneurship within the country. Given its influence, it is important that CSI plays the role of an intermediate effectively. This will ensure that the opportunities presented by IT advancement in the country reaches the relevant audience in the most effective manner. With a carefully thought out approach, CSI can be instrumental in helping the industry address the skill gap in the IT sector. It needs to change its focus on building the skill sets of Indian IT professionals and work on industry needs and demands through newer initiatives.

### 5. How can SGS and CSI work together in PM's mission of Digital India?

Through the Digital India mission, the government is planning to train 1 crore students from small towns and villages for the IT sector over a period of next 5 years. Under the mission, the government will also train 3,00,000 service delivery agents in two years to run viable businesses delivering IT services. The Digital India mission of the government provides a huge boost to the IT sector. The BPM sector sees much potential in the Tier 2 and Tier 3 cities of the country in terms of employment and skill development.

Digital India framework and policy initiatives under DeitY, the BPO policy aims to create new BPO centres in different NE states and also in smaller /mofussil towns of other states. SGS, given its dominant play in the BPO segment can partner with the government to set up BPO centres and provide the requisite expertise.

## Green Engineering: Future Internet Perspective

Internet has revolutionized this world by connecting billions of people. It has grown from its humble beginnings as a means of communicating between computers to a highly sophisticated super highway that caters to every need starting from say turning on a fan at home from a remote location to controlling mission critical applications. Today wide array of devices are connected to internet ranging in the billions. Everyone's life is digitized and has a digital footprint. Even though one doesn't use internet directly, he/she leaves a digital footprint even without his/her realization. So with such a high impacting technology, the original architecture was not intended to serve his huge demand and address the threats that come along with it. So with this high dependency on internet we have no other option but to have a robust design that addresses the internet of today. Today's research activities on the Internet are multi-dimensional tackling various socio-economic and ethical issues. In a world digitizing very fast, the most important need of the hour is to digitize and connect in a safe way protecting individual and organizations' identity and assets. It must also be able to scale and be reliable to huge demand and more importantly be mobile.

Having said that the original internet is put under strain in handling the current demands it is important to note that the addressing scheme of the present internet is one of the areas that need more focus as it in turn affects the security, routing scalability and mobility of the involved devices. Considering the fact that the future internet is a confluence of various devices/things/technologies that are manufactured by different vendors following different protocols, and the massive increase in the number of devices being added to the pool connected to the internet, the routing entries have been increasing to an unmanageable number that the core routers are not able to keep up with the speed and thereby lead to a significant degradation in performance. Also, multi-homing (a scenario that includes two or more internet connectivity from two or more ISPs at a particular site), has made it tedious as the address block

of one ISP has to be stored on the routing table of the other ISP thereby increasing the volume tremendously. The present global addressing scheme has given rise to security issues (open networking) wherein all nodes that share the same medium are able to hear packets that are destined to it and others as well. Further, the host centric, point to point paradigm that exists in the current Internet addressing scheme for transfer of content seems irrelevant to users who are interested only in the content. Replacing the IP (location for connection establishment in original internet) with the name of the content in the Future Internet will lead to a significant change in the process of information retrieval. Also a very common argument is that the global addressing scheme with the IPv4 is at the verge of exhaustion due to the address limitation and increasing devices/things. Several methods such as the Host Identity protocol (HIP), IPv6 etc have been introduced to deal with these issues involved in addressing, however each of them have their own limitations thereby necessitating the evolution of a new Internet architecture and addressing schemes in the Future Internet (FI)<sup>[1]</sup>.

It is envisaged that, the FI consist of large number of electromechanical devices which generates lot of Greenhouse Gas (CHG). India has set the target to reduce CHG emission intensity by year 2020<sup>[2]</sup>. Around 4 % of CHG emission is generated from ICT products and around 25% of the CHG emission is from telecom sector. To reduce carbon emission from ICT, it is very important to quantify the emission from networks and devices across the life cycle from manufacturing to waste disposal. Green ICT as a set of evolving tools, methods, techniques and applications of Information and Communication Technology that can be used for reducing the carbon footprint of all human activity including the ICT sector itself. Green engineering metrics will surely help network and telecom operators to estimate energy efficiency and carbon emission involved in operations. There is a need of energy efficient technologies, protocols and schemes to minimize energy consumption in telecom networks using Green ICT metrics. When network and

telecom devices are in actual use, there is predominant emission of CHG. Utilization of network and devices always results into more power consumption and that is the key factor for emission of CHG in the network. Following are the key measures for reducing the power consumption:

- Appropriate network planning
- Effective infrastructure sharing
- Adaptive energy efficient technologies
- Effective use of power
- Use of renewable energy sources

There are various standard bodies like TRAI, ETSI, ITU-T Study Group 5, ATIS and ICT Ecology Guideline Council of Japan have recommended green ICT metrics which include equipment level energy efficiency (capability to express energy efficiency at the device level), facility level energy efficiency (capability to express energy efficiency at service level like cooling, lighting etc.), power usage efficiency (load on telecom equipment), carbon footprint (CHG emission), benchmarking (for evaluation purpose), clarity, adaptiveness to emerging technology, and vendor independent metrics. In the future Internet perspective, green ICT metrics are classified into three major areas like access network, core network and data centres. Access network include fixed telecom devices and wireless communication devices, core network includes transport layer network devices and mobile network devices, data centre equipment include servers, routers, storage equipment (main frame and non-main frame).

### Global Efforts

At the global level, several initiatives and programs are on the way on "Greening" of ICT and leveraging the power of ICT for creating the low carbon economy and society. Few of them are listed below<sup>[3]</sup>:

1. *Global e-Sustainability Initiative (GeSI)* - <http://www.gesi.org>

GeSI is a non-profit organization, headquartered in Brussels, Belgium that brings together ICT companies, industry associations and NGOs to further the cause of sustainable economy using innovative use of ICT. GeSI was formed 2001 and has over 25 global companies and organizations as its associate

members. Some of the world's largest technology companies and service providers are its members.

2. *The Green Grid (TGG* - <http://www.thegreengrid.org/>)

It is consortium of over 180 organizations across the globe. Few technology companies are on the board of Green Grid and it focuses on the energy efficiency in data centers and computing environments.

3. *Climate savers computing initiative (CSCI* - <http://www.climatesaverscomputing.org/>)

The Climate Savers is a non-profit organization started in 2007 by Google and Intel. It has as its board some of the world's leading PC technology companies like Dell and HP. It has over 500 members worldwide. The focus of this group is on energy efficient PC and servers.

4. *US Energy Star\* Program* (<http://www.energystar.gov/>)

Energy Star\* is an initiative of the US Environmental Protection Agency and Department of Energy. The Energy Star program for computers aims to generate awareness of energy saving capabilities and accelerate the market penetration of more energy-efficient technologies. In July 2009, Energy Star\* release the Version 5 of its specifications for PCs, Laptops,

Power Supplies, Displays, Workstations and Thin Clients.

5. *Smart Grid Interoperability Panel*

The Smart Grid Interoperability Panel (SGIP) is a membership-based organization created by the US National Institute of Standards and Technology (NIST). NIST is responsible for coordinating the development of and publishing a framework, including protocols and model standards, to achieve interoperability of Smart Grid devices and systems.

There is requirement of technology standard to reduce the CO2 emission. There are various study groups like ITU-T study group 5 which deals with standardization, environmental impact, energy efficient solution for ICT devices and recycling strategies for ICT equipment. There are various emerging areas like next generation networks, Internet of Things (which includes ubiquitous sensor networks, wireless sensor networks), smart grid and intelligent transport system<sup>[4, 5]</sup>.

In conclusion, there is need of intelligent power management schemes, consolidation and virtualization techniques to improve CPU utilization, optimal network design with efficient radio base stations, intelligent broadband

equipment, highly efficient home gateways and modems. PCs and peripherals will have the largest CO2 footprint in the ICT sector since the number of PCs is expected to touch 4 billion by 2020. Efficient use of power management and reduction of idle power will help in reducing power.

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## Green ICT in Higher Education: the Next Frontier for Sustainable Growth

An environment-friendly aspect of computing refers to green ICT for sustainable growth. In other words, it refers to environmentally sustainable development in computing and ICT. Green computing is one of the emerging technologies that have garnered special attention. Green technologies in general are aimed at reducing the carbon emission to the atmosphere.

Information Communication Technology development without an eye on environmental protection is not sustainable. There is necessitating eagerness to protect our natural world from environmental issues for current and future generations. Recently biggest challenge facing the environment is global warming and climate change caused by carbon emission. It is very much necessary to save the earth. Nowadays, most Higher Education Institutions rely on Information and Communication Technology (ICT) for all aspects of activities such as administration, teaching, learning and research.

India possesses a highly developed higher education system which offers facility of education and training in almost of all aspects of human creative and intellectual endeavors. In its size and diversity, India has the third largest higher education system in the world, next only to China and United States<sup>[1]</sup>. Over the years, there has been a significant increase in number of colleges and students enrolled in Higher Education across the nation, with more than a hundred colleges and institutes affiliated to some universities. Hence, green ICT implementation at institute has developed into key factor to attain the cost effective solutions and sustenance of ICT.

Government of India ministry of Environment and Forests (2011) have developed national mission for Green India under the National Action Plan on Climate Change (NAPCC). They have presented tentative action plan for Implementations of the Green India mission during 2011-12<sup>[2]</sup>.

The SMART 2020 report reveals that carbon dioxide emissions from the ICT sector will represent an estimated

2.8% of total global emissions by the year 2020. The impacts of ICT on human health and environment like hazardous electronic waste, health risk, climate change, global warming and land and water pollution etc are increasing day by day<sup>[3]</sup>.

This article endeavor has to find innovative ways to minimize above mentioned impact and to sustain use of ICT. The article shares a perspective on what Green ICT really is, what green practices to be followed, what benefits does it offer to higher education, what are the factors for successful GICT and also what are the barriers towards the implementation of Green ICT.

The ICT in education is a cause of carbon dioxide emission, high energy consumption and hazardous waste production. This pressure led professional institutions to adopt Green ICT or sustainable ICT practices so as to minimize energy consumption, carbon footprint, ICT waste, to maximize recycling and reuse. The researcher defined GICT as "Green Information and Communication Technology is an innovative way of using ICT related to the environment protection and sustainability of ICT in future."

Green ICT has been a dynamic research area which ponders a productive utilization of IT equipment. It is basic need to motivate the stakeholders of education institutions to think green for sustenance of ICT, society and globe. The green ICT practices are lessening greenhouse gas emanations however by keeping utilization of ICT as it is in our everyday life. The aim of this article is to focus on the awareness of Green ICT, identify the green practices followed by the higher education and analyze critical success factors for its effective as well as successful implementation. Green ICT implementation will ensure that natural resources are conserved and are available for our next generation to continue a way of life which is environment friendly.

The following Fig. 1.1 depicts the components of Green ICT implementation explored from literature review which focuses on green ICT implementation



Fig. 1.1: Components of Green ICT Implementation (Source: Researcher Contribution)

practices, factors, benefits and barriers to the educational institutions. The researcher has given detailed discussion on these components namely Green Practices, Green Factors, Green Benefits and Green Barriers in following sections.

### Green Practices

By implementing Green ICT, higher education ultimately ensure the sustainability of the IT resources. The green ICT practices like 'End User PC Power Management', 'Purchasing Energy Star /EPEAT Rating hardware', 'Reducing energy consumption by powering down of ICT devices', 'Use of Recycled paper' and 'Reducing paper and consumable usage' are need to be robustly followed by higher education. Nevertheless the GICT practices like 'Use of Thin Client Model' and 'Reuse and Refurbish Policy' are also need to be followed. At the same time the some green ICT practices like 'Established Green ICT Committee' and 'Implementing Green ICT Policy' are sincerely need to be deliberated by higher education. However, the green practice of use of renewable energy sources like solar, water need to be initiated at large level.

### Green Factors

The study not only discovered factors for successful implementation of GICT but also scrutinized the critical ranking of these factors. Green ICT implementation



cheers and sustains greener activities by the stakeholders of higher education. Apart from GICT practice, the research study is identified most critical factor affecting the success of Green ICT implementation which is none other than 'Energy Conservation'. The second most critical factor of GICT implementation is 'Cost Reduction' and 'Corporate Social Responsibility'. The success factors of GICT implementation are analyzed on the basis of rigorous literature review which are mentioned in an order of the critical ranks like Energy Conservation, Cost Reduction, ICT Carbon Emissions, Institutional Own Policy, Optimum Utilization of Resources, Corporate Social Responsibility, Hazardous material from ICT equipments, and Government Legislation.

#### Green Benefits

With the increasing awareness of environmental issues around the world, most of institutes are turned to green ICT initiatives. The study showed that there are not only significant environmental benefits to these initiatives, but also they also yield substantial cost effective benefits. Some of the benefits as a part of Green ICT implementation are as follows:

##### (a) Minimize carbon footprint and hazardous e-waste

The Green ICT in education helps in reducing wastes by recycling IT equipment which ultimately expands the lifespan of ICT equipment. As a result of followed green practice the higher education would be benefited in terms of minimize carbon footprint and hazardous e-waste.

##### (b) Environment sustainability

The Green practices of powering down

of ICT devices, complying with the regulatory standards for ICT procurement procedures and reducing hazardous ICT waste. Thus protecting mother earth from land and water pollution and achieved environment sustainability as a benefit of green practices.

##### (c) Reduce energy cost

The benefit of reduced energy cost and optimum utilization of resources can be achieved as a result of Green ICT implementation in higher education.

##### (d) Compliance with Institutional legal regulations

The Green ICT in education would help in complying the government laws, protocols for sustainability by way of reducing e-waste, recycling of ICT equipments and minimizing electrical energy usage. It implies that there is need of strict government regulation and compliance.

##### (e) Achieved corporate social responsibility

The green benefit of the attaining corporate social responsibility is an outcome of GICT implementation. Now a day's achieving corporate social responsibility is playing major role in holistic development of nation and also government has made many regulations towards that. The sustenance of ICT leads to the sustenance of earth. Now a day's academic professionals are now concerned about environmental problems and not only teach but also motivates society to follow green practices for protection of world which in turn helps in improving public image in the society.

#### Green Barriers

The Green ICT as an imperative area is

recently started to boom with academic IT professional including administrative people. It is observed that the faculties and most of students have not keen to know electricity bill of consumed energy of the institute. The lack of government strict regulation and rational of adopting green policies are the real hurdles in implementation of Green ICT in education. Budgetary constraint can be one of the barriers of GICT implementation. The lack of motivation to go green in the approach of using ICT like by reducing print volumes and using conference calls to reduce unnecessary travel are barriers of Green ICT.

This shows that Green ICT implementation is only the solution to achieve future sustainability of ICT and has become key factor to achieve cost effective solutions as well as for sustenance of ICT in future. It is concluded that the issue of Green ICT is very important in upcoming years for sustainable growth.

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## Green Computing - Saving the Environment with Intelligent use of Computing

**Abstract:-** Green Computing is a approach for handle environment issues created by computing. The goal of Green Computing is to make environment friendly computing. In this era computing plays important role in environment pollution because end users are not going with smart computing. There are many tools are provided by various companies for virtualization, power management, storage management and dynamic frequency scaling. These tools are helpful in creating environment sustainability. This paper elaborates Green Computing with current issues and the intelligence use of computing through best tools and techniques.

### Introduction

Green Computing is a solution for environment sustainability, Where any part of computer do not pollute the environment system. The main focus of Green Computing is to reduce harmful material used in computers, boost the energy efficiency and create recyclability of waste. In computer data centres power is consumed at huge level. To reduce the consumption of power virtualization, power management techniques and cooling systems are used. Many tips, plans, tools and technologies are used for the purpose of Green Computing.

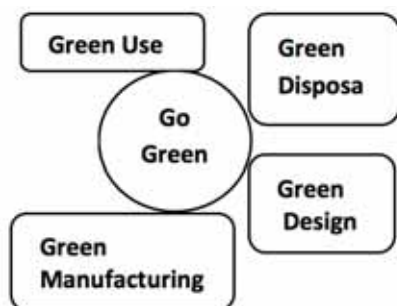


Fig. 1: Green computing concept

**Green Use:** Reduce the power consumption of computer system and use them in environmentally sound manner.

**Green Disposal:** Recycle and reuse of computer waste.

**Green Design:** Reduce hazardous material production.

**Green Manufacturing:** Manufacture computers and other sub parts with minimal impact on environment.

### Advantages of Green Computing

Green Computing is a way to save environment as well as human health. There are following major advantages of Green Computing.

1. Reduce power consumption leads to

lower carbon dioxide emission.

2. Reduce in fossil fuel used in power plants and transportation.
3. Saving energy and resources saves the money.
4. Green computing includes changing government policies to encourage recycling and lowering energy use by individuals
5. Reduce chemical risk in laptops which is cause of cancer.

### Challenges

Green Computing play act as a hot challenge in computing field. There are following major challenges resides in Green Computing.

1. Green Computing is a costly approach.
2. Managing heterogeneous workload with green computing is a tough task.
3. Rapid technology change is a big issue in green computing.
4. Recycling of parts is a major problem. Toxic material are non recyclable.
5. Optimization of virtual network topologies is a challenging process in the way of green computing.

### Minor Tips for Green Computing

There are some tips for end users. By using these tips end user can play a great role in Green Computing.

1. Don't use screen savers.
2. Use sleep mode to save power than remains on your screen.
3. Go for Switch off than Shut down.
4. Use Thin Client than GPU.
5. Go for flash drives for reduce power consumption.
6. Use virtualization than Physical server of files.
7. Do not storage useless data online using drives.
8. Do not use social website only for the sake of time pass.
9. Use low brightness.
10. Use Blackle than Google.

### Major Approaches for Green Computing

There are many approaches are available for the purpose of green computing.

**1. Virtualization:** Virtualization refers to abstraction of computer resources. In virtualization the process of two or more logical computer systems on one set of physical hardware. With virtualization a system administrator become able to combine several physical systems in to a single virtual machine with the help of single system. virtualization reduce power and cooling consumption. The virtualization tools are provided by VMware, Citrix, StarWind, WinImage.

**2. PC Power Management:** Reduce power consumption is included under PC power management. There is a feature of directly control power saving in some operating systems. This allows a system to automatically turn off components such as monitors and hard drives after some period of inactivity. The power management for microprocessor can be done over the whole processor or in specific area. There are many software available PC power management like PowerMan, PowerSave, Surveyor, LongRun, LongRun2.

**3. Dynamic Frequency Scaling:** Dynamic frequency scaling is the part of power management which helps to handle clock rate, decrease voltage. Power management decrease power consumption at the price of slower performance. PowerNow!, Cool'n'Quiet, SpeedStep and LongHaul are softwares used for dynamic frequency scaling in processors.

**4. Storage:** Power consumption can be reduce by using low capacity flash based devices. Solid State SSDs can be used but DRAM based SSD's use more power than hard disks for example 4GB i-RAM consumes more power and space

than laptop drives. The increase in online storage using MySpace and other drives increase power consumption.

**5. Video Card:** A fast Graphic Processing Unit consumes lot of power.

For the sake of energy saving use thin client, share terminals, motherboard video outputs.

**6. Monitor Screens:** CRT monitors consume more power than LCD and LED

monitors. Average consumption of CRT is 76w and of LCD is 20w. Increasing the brightness leads to increasing the power consumption. LED consumes less power than CRT and LCD.

Table 1. Comparison of green computing software's.

S.No.	Attributes	Type	Operating System or Processor	Significant features
1	VMware VSphere	Desktop Virtualization	Windows, Linux, Mac OS	Products for server and application virtualization are also provided
2	Citrix DaaS	Virtualization software	Microsoft OS	Include Wrox mobile apps and AppDNA
3	PwerNow!	Dynamic frequency scaling	AMD	VCore automatically decreased
4	Cool'n'Quiet	Dynamic frequency scaling	AMD, Linux , Window XP, vista and 7	Decrease voltage
5	SpeedStep	Dynamic frequency scaling	Intel, Window, Mac, Linux, BSD, Solaris	Compatible with other processors also
6	PowerMan	PC Power Management	Windows	Web based, multi-location reporting
7	Surveyor	PC Power Management	Depending on virtual servers	Sustainability Dashboard
8	LongRun2	PC Power Management	Introduced with Eeffceon processor	Reduce the variations in manufacturing process

Above Table defines the different software's provided by different companies for Green Computing. Where VMware, SpeedStep and PC Power Management software's can play grand role in Green Computing.

**1. VMware** product are best for virtualization because VMware provide virtualization for Servers, Applications and Files. With the help of these product we can handle virtualization on many operation systems as described in Table 1.

**2. SpeedStep** is a product of Intel which can be used with some other processors also. This processor helps to handle dynamic frequency scaling. SpeedStep supports more OS's than other products.

**3. Software** used for PC power management described in Table 1 are beneficial for the users of Microsoft Window but you have to check virtual server before installing **Surveyor**.

### Major Implementations by Industries for Green Computing

Various Industries developed computing products which are act as environment friendly products. Some of those products are detailed below.

**1. Blackle:** Blackle is a search engine

site powered by Google. Blackle is based on the fact that different color can consume different amount of energy. White page or Google home page consume 74w but blackle page can consume only 59w. If everyone switched from Google to Blackle than we can save 750MW each year.

**2. Fit-PC:** Fit-PC is manufactured by CompuLab. Fit-PC is a tiny PC used only 5w in a day. This PC is able to work with Window XP and Linux.

**3. Zonbu Computer:** Zonbu is a technology company which develops small form factor PC's. It consumes one third power of a typical light bulb. This device runs on Linux OS.

**4. Asus Eee PC:** Asus Eee PC is a netbook by ASUSTeK Computer incorporated. This is known as ultraportable PC. Weight of this PC is less than kilogram, has built in Wi-Fi, use flash memory and run Linux too.

**5. D-Link:** D-Link's Green Ethernet technology will put the port in sleep mode, thus reducing power consumption by the port.

### Conclusions

Green Computing is a major concept which can be able to change whole digital life. There are many tools, plan

and techniques are present for reduce power consumption but Recycling and reusability is major issue that can be solve with the awareness of end users and with the intelligence of developers. Consumer don't care about the ecological impact of the system, just cared about speed and price. If end user go with the tips as described in this article can solve many problems of environment sustainability. New green materials are developed every year and many toxic are replaced with them. Like Blackle, Fit-PC, Eee PC, D-Link are productions for the purpose of green computing. Go with Virtualization, Power management, flash memories, thin client for reduce power consumption. Lack of awareness becomes a big hurdle in the way of Green Computing. Problems can be solved out when end user become aware about environment.

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## Measures for Green Initiatives

**Green Computing** plays a vital role in the environment and global warming. Adopting green practices and standards will reduce carbon footprint and reduce the energy consumptions. The following Ten Commandments towards Green initiatives are for raising public awareness and for sustainable energy.

### 1 Reduce

a. do not hyper-consume. Analyze and understand the business requirements. Whether energy or IT infrastructure, eliminate and reduce unwanted consumption.

b. Reducing the number of servers and optimizing its usage means cutting over allocation of resources, less power, low cooling costs and less floor space. A reduction of 10% in fan speed yields reduction energy of roughly 27%. Reducing fan speed by 15% yields electrical savings of approximately 40%.

### 2 Reuse

a. Instead of throwing away the used equipment, check for parts in the equipment and reuse wherever necessary.

### 3 Recycle

a. when any resource could not be reused then recycle it through environmentally friendly process. Recycling offers huge energy savings.

b. E-Parisaraa India's first scientific electronic waste recycling unit started operations from August 2005, valuable metals, plastics and glass from the waste in eco friendly manner.

### 4 Regulations

a. The lack of a formal mandate is many a times the reason for lack of adoption.

b. LEED is the popular India Green Building rating system. Relevant to the

local climate and regional practices, the IGBC is developing new rating programs. TERI (The Energy Resources Institute) has come out with a certified process named as GRIHA (Green Rating for Integrated Habitat Assessment), which has been adopted by the Government of India.

### 5 Replace

a. Replace CRT with TFT monitors as LCD monitors with LED consumes less power.

b. Laptop consumes between 15 and 30 watts, a laptop in standby mode consumes only a watt or two.

### 6 Renewable energy

a. A worldwide rising demand for electricity and growing interest in eco-friendly technologies are reasons for renewable energy growth.

b. Organizations and consumers can go for solar, wind and hydroelectric generated gadgets to reduce dependence on power from the grid. Renewable energy is nonpolluting and highly reliable which has been growing globally at a rate of about 25% per year.

### 7 Responsibilities

a. Individual responsibility : Everyone to be accountable for the products they consume and their subsequent disposal.

b. Social responsibility : demands equal and ethical treatment from within and outside the jurisdiction of an individual, in dealing with hazardous wastes and other environmental risks and impacts.

### 8 Rethink

a. Managing Devices such as Servers and pc's run in IT organizations for 24x7. Monitor the usage and turn off the devices that keep idling in the

organization. Computer Monitors use zero energy when turned off. Turn off your monitors when you're away from the system. Turn on the hibernation or sleep mode for a few minutes break. Turn off the screen savers. It uses almost 42 watts and those with 3D graphics uses as much as two and half times more than average watts.

b. Rarely accessed applications and data can be stored on lower speed and less expensive devices so that it consumes less energy consumption.

### 9 Recover

a. A company in debt can recover from that by monetary savings through maximum utilization of resources at no extra cost, reduced energy expenditures and better return on investments.

### 10 Refuse

a. A non-greener company, with non-green products services should be refused by the consumers to make the company to rethink its policy and making them to Go Green.

The path to green computing is all about the intersection between consumers and producers of electronic devices. Adhering to the initiatives offers greater return on green environment.

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## Green Computing

### Introduction

Now a day we are using computer systems for complex calculations, office work, online billing, online shopping, online games etc. It is good that all these work can done with less time and in easier way but we are not concerned about the negative effects of using computer in our environment.

Computer is made up of heavy elements like silicon, germanium, etc. and hazardous chemicals. These elements & chemicals cause global warming and impact on environment. Metals like gold, silver, copper are extracted by burning the substances & that process release poisonous gases into air. Unnecessary searching in internet is also causing increase in CO<sub>2</sub> (carbon dioxide) which tends to global warming and the people surrounded by these e-waste causes disease such as cancer, kidney diseases etc. Data centers are being the reason for more energy consumption. Consumer does not care about ecological impacts when buying computer.

The carbon emission due to search engine is approximately 7g, every day in the environment and it is heavily impacting our environment. There is 0.2g carbon emission in the environment for every search made in any search engine. Google has figure out some data sharing with you here; Search Engine emits 0.2g for every search, Youtube emits 1g for every 10 minutes video watched, Gmail emits 1.2g per year for one user, only. Google has evaluated 1.46kg of CO<sub>2</sub> by utilizing its various services like Gmail, Youtube, Search engine, Blogger, AdSense, etc.

**Green Computing:** Green Computing is a technique of using systems and technology in eco-friendly manner. It is also known as by Green technology. This concept use computer and related resource in environmentally responsible manner. This involves uses the energy efficient central processing unit, servers and peripheral too. And also involve the proper disposal of E-waste material.

**To promote green computing following four approaches are employed:-**

**1. Green Use:** Use computer and peripheral device in way that consume minimum energy and in eco-friendly manner.

**2. Green Disposal:** This is about to proper disposal of electronic waste. The electronic devices and electronic part contain toxic elements that harms to human beings. So, unwanted electronic material should be recycled or disposed in proper way.

**3. Green Design:** It evolved designing of energy efficient computers, processor, printer, projector, digital devices.

**4. Green Manufacturing:** Green Manufacturing involves the minimizing of waste during manufacturing of computer, server, processor and other digital devices.

**Eco-friendly Data Center:** Since, IT (Information Technology) companies have spread all over the world, for example, Google, Apple, Facebook, Yahoo, Infosys, Amazon, TCS etc. All Information Technology sector companies use data center to proper managing, storing, manipulating of huge amount of data in central place. Recently Data centers are the most causes for consuming energy as well as releasing CO<sub>2</sub> in environment. By keeping this in mind many IT company applying the concept of eco-friendly data centers and using highly efficient power system, eco-friendly building materials, free cooling, virtualization to develop their data centers. Some of them are following:-

### Eco-friendly IT (Information Technology) Office Buildings

With the keep in mind of reducing computer effects on environment IT engineer, software developer, etc. are implementing their work place i.e. IT building in eco-friendly way, one of these are follows

### Indira Paryavaran Bhavan

It is India's first Net Zero Energy consumption building, situated in New Delhi. This new building is constructed, and the project was started in 2011 and inaugurated on 25 February 2014.

### Some basic ideas to implement Green Computing :-

1. Use energy efficient computer, server, processor, monitor etc.
2. Proper disposing of E-waste material
3. Put system in hibernate, sleep when system is on but we are not working in it.

4. Reduce unnecessary printing of paper through printer. It saves energy as well as tree.
5. Recycling of wasted Electric material, unwanted part of system.
6. Use Laptop, Smartphone, and Tablet
7. Use a flat panel display instead of a CRT monitor.
8. Set your Power Management options.
9. Do not leave the computer running all the time
10. Buy Energy Star equipment.
11. Develop efficient programming code
12. Promote Green Computing.
13. Read PDF files instead of files in other format.
14. Make use of paper, efficiently.
15. If you are not using any software application, then close it.
16. Reusability of old and broken electronic devices.
17. Turn off screensaver, it saves energy but emits CO<sub>2</sub>
18. Upgrade your video/graphics card which is energy efficient.
19. Set your monitor in sleep mode, if inactive.
20. Use LED monitor instead of LCD or CRT.
21. Optimize or close the operating system services, which are not required.
22. Turn off Bluetooth, wifi, if not in use.
23. Adjust brightness of monitor as per requirement.
24. Use all power/energy management settings so that computer work with little power and hence, little carbon emission.
25. Properly dispose the electronic equipment after the life time. Suppose, the life time of personal computer is of 5 years, only and after that it emits carbon more than the new one.
26. Use Energy Star labeled and licensed electronic devices for your computer system.

27. Perform personal computer maintenance, regularly.

#### Using "Holy Basil" Plant

Now a day Companies like Google, yahoo, IBM (International Business Machine) are investing billions of dollars for developing

eco-friendly data centers and for purchasing renewable energy project, power agreement, etc. We can also promote green computing through using project like "Planting of Holy Basil" near data center, any IT building, IT University and IT office. Holy

Basil plant is not good for health but also for our environment. This plant consumes poisonous gasses like CO<sub>2</sub> and release oxygen for 20 hour. So planting of Holy Basil plan in wide area near to data centers and IT building will tend to absorption of poisonous gasses and heat released by data centers or IT building for 20hour. This project will reduce the negative effects of system in our environment and Green computing will be promoted.

#### Conclusion

We have found that IT companies and data centers has already owned the several ways, projects, and ideas to reduce power consumption and promoting green computing. If an individual person, schools, colleges, universities, organizations will apply these that will help to promote green computing and Reduce Power consumption in personal level. The idea will make us more eco-friendly and safe our environment. By protecting environment we will able to protect our life.

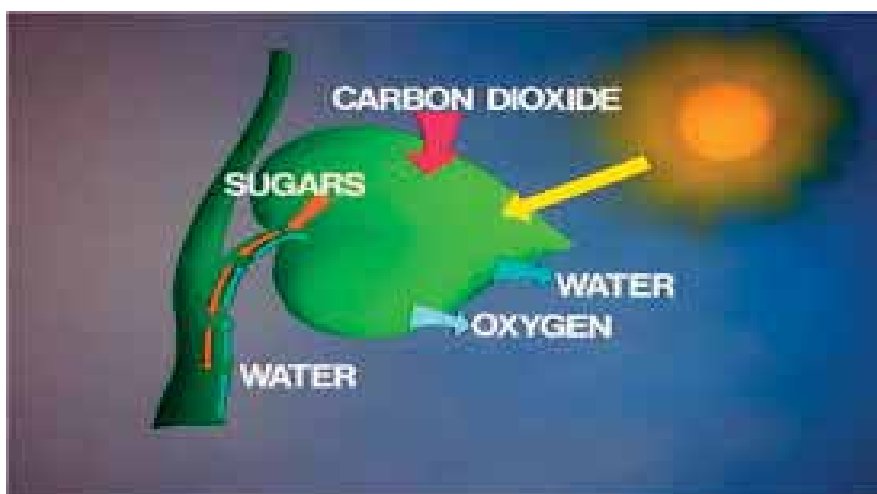


Fig. 1: Hypotheses of Holy Basil Plant

About the Author



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### Kind Attention: Prospective Contributors of CSI Communications

Please note that Cover Theme for forthcoming issue is planned as follows:

#### • September 2015 - Image and Video Processing

Articles may be submitted in the categories such as: *Cover Story, Research Front, Technical Trends and Article*. Please send your contributions **before 20th August 2015** for September issue. The articles may be long (2500-3000 words maximum) or short (1000-1500 words) and authored in as original text. **Plagiarism is strictly prohibited.**

Please note that CSI Communications is a magazine for members at large and **not a research journal** for publishing full-fledged research papers. Therefore, we expect articles written at the level of general audience of varied member categories. Equations and mathematical expressions within articles are not recommended and, if absolutely necessary, should be minimum. Include a brief biography of four to six lines, indicating CSI Membership no., for each author with high resolution author photograph.

Please send your article in MS-Word and/or PDF format to **Dr. Vipin Tyagi**, Guest Editor, via email id **dr.vipin.tyagi@gmail.com** with a copy to [csic@csi-india.org](mailto:csic@csi-india.org).

(Issued on the behalf of Editorial Board CSI Communications)

# The Concept of Software Recycle

## Retrofitting Older Generation (Used) Components with Newer Components

Software Recycle is closely related to the concept of Green Software Engineering but takes a deviation that it not only concentrates on the aspects of green processes applicable to software development but enhances them to include software reuse, retrofitting, component based development and cataloguing. It directly impacts the power consumption, resource usage, efficiency of software, effectiveness of development process, utilization of development manpower a net result that allows contribution to a green ecosystem or environment. Such maturity in Software Engineering thought processes for product development leads to a *rooted* contribution of Software & Programming companies, as other Engineering companies, to a greener society.

Software Recycle, takes software reuse to a newer level wherein components that were written in older languages (of the current or earlier era), but which could be useful in certain scenarios are retrofitted with newer components or functionality and then put up on a public catalogue for use. This helps in reusing much of the functionality without requiring to rewrite a lot of it. It will essentially then be a public catalogue of software components, promoting component based development. The greatest advantage will be that it would include thoroughly tested, documented and maintainable code which could allow to save time in development. The possible users of this catalogue include students,

professionals and organisations alike.

It could also act as a source of learning for computer science students, to understand software reuse, component based development, object oriented programming and variety of other topics. This is not only through the thousands of components in the catalogue that would be available for download, but also from legacy components that would have been retrofitted with newer components to enable reuse.

It finally comes with an advantage of acting as a catalogue of software components that can be used both publicly or privately within an organisation. This enables a good amount of knowledge sharing in the entire organisation and also in enabling a centralized repository.

Codesmith is the proposed application idea that is based on this new concept of Software Recycle. Apart from all the necessary aspects of Software Recycle, Organisations get another opportunity here to showcase not only their freeware and open source software, but also put up components for sale that could be useful for others. Also, developers get to host their components for sale on the site. Codesmith could also act as a source of hiring developers based on various competitions, interviews, tests and even based on their own components.

As part of my research, I found that there is one another active group working on and promoting a closely related or similar idea. This is a project supported by University of Hamburg, Germany and

the German Federal Ministry of Education and Research (Among Other Supporters), the details of which can be found at <http://www.greensoftwareengineering.de/en/project.html>

It is very important that we understand some terms on the path to the evolution of Software Recycle, before we define the same. *From the above mentioned site*, I quote as below:

**"Green IT** is the study and practice of designing, manufacturing, using and disposing IT related hardware products in an efficient sustainable way with minimal or even no impact on the environment."

**"Green Software Engineering** was the attempt to apply these "green" principles known from hardware products also on software products, software development processes and their underlying software process models."

**"Sustainable Software** is software, whose direct and indirect negative impacts on economy, society, human beings, and environment that result from development, deployment, and usage of the software are minimal and/or which has a positive effect on sustainable development."

Software Recycle can be now defined as:

*"Software Recycling includes software reuse taken to a new level, wherein the components that are outdated or written in older generation languages (of current era) are retrofitted with newer components. Such reuse that that directly impacts the power consumption, resource usage, efficiency of software, effectiveness of process, utilization*

	PRODUCTION	USAGE	END OF LIFE
FIRST-ORDER EFFECTS	<ul style="list-style-type: none"><li>◆ Office HVAC</li><li>◆ Energy for ICT</li><li>◆ Office Lighting</li><li>◆ Working Conditions</li><li>◆ Manuals</li><li>◆ Download Size</li><li>◆ Packaging</li></ul>	<ul style="list-style-type: none"><li>◆ Energy Consumption</li><li>◆ Resource Consumption</li><li>◆ Hardware Requirements</li></ul>	<ul style="list-style-type: none"><li>◆ Manuals</li><li>◆ Packaging</li><li>◆ Legal Issues</li><li>◆ Data Conversion</li></ul>
SECOND-ORDER EFFECTS	<ul style="list-style-type: none"><li>◆ Globally Distributed Dev Teams</li></ul>	<ul style="list-style-type: none"><li>◆ Dematerialization</li></ul>	<ul style="list-style-type: none"><li>◆ Media Disruptions</li></ul>
THIRD-ORDER EFFECTS	<ul style="list-style-type: none"><li>◆ Changes in Dev Process</li><li>◆ Changes in Organization</li></ul>	<ul style="list-style-type: none"><li>◆ Changes in Biz Process</li></ul>	<ul style="list-style-type: none"><li>◆ Demand for new Products</li></ul>



of development manpower and leads to a green ecosystem or environment is termed as **Software Recycle."**

The usage of Software Recycle as a firm notion and through products such as Codesmith, will then be more impactful in these lifecycle phases of the Sustainable Software Process or Engineering.

Since Software Recycle involves cataloguing and reuse alongwith retrofitting It helps in such a way so that each individual component (for building software) identified in any of the "Green Requirements Engineering Process", "Green Design Engineering Process" and "Green Analysis Process" is always proven to adhere to the above matrix.

Also, with the adoption of Software Recycle, there is no "Disposal" stage that needs to be demarcated for software artifacts in the "Green Software Engineering Process". Since the entire process now is mostly (or completely) driven by "Energy Efficient or Green Reusable Software Components" They are automatically available for recycle (either via direct reuse/ incorporation or via retrofitting). Any components that were of earlier generation, after retrofitting

will also be available for Cataloguing. When infused into any software process, Software Recycle will require almost no "Disposal" of any created software artifacts and will mostly lead to "Thoroughly Analyzed, Architected, Tested and Energy Efficient Components with Documentation". Almost always, in an Enterprise, such cataloguing mechanisms lead to an overall positive gains in power consumption, hardware usage, common resource usage and utilization of development manpower.

With multiple fields and domains remaining to be automated, more than 60% of the world's population yet to gain internet access we can only visualize the exhaustive and largescale software development that is to yet to happen within and across organizations. Along with this, there are newer internet needs that multiple software products usually serve and in turn also keep creating newer 'desires' for internet users. It is about time, that all "Software and Programming" (Software) organisations adopt a strategy for "Energy Efficient Reusable Software Development" in conjunction with "Green Software Engineering". To implement this,

the thought process of Software Recycle, along with tools like Codesmith, will allow for an easier adoption, thorough, processinfused, resource efficient, green and scalable development lifecycle.

#### Glossary of Terms

Codesmith was a Software Application Idea that is based on the concepts mentioned in this article. This was to be built by the now closed startup, named TechArmy, of the Author.

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## Obituary

Prof. S. G. Shah (75), former Regional Vice President, CSI (Region 3) during 2009-2013, a renowned academician, who devoted his entire life for academia, passed away on 24<sup>th</sup> April, 2015. He served M S University, Vadodara from 1966 to 2003 on various positions including as Dean of Faculty of Technology. Later on he served as an Advisor to Charotar University of Science & Technology, Changa, Gujarat and played significant role in development of the university. He was actively associated with CSI,Vadodara Chapter and The Institution of Engineers (India), Vadodara Local Centre.

An alumnus of IIT, Mumbai and M.S. University Vadodara, he organized many national and international conferences in the area of Electronics, Systems, Computer Education, Entrepreneurship Development, Incubation and Educational Planning. His research papers were published in reputed National and International journals in the area of Controls, Electronics, Computer and Microprocessor.

The passing away of this veteran is a great loss to CSI, academia and society in general. May his soul rest in eternal peace.



# Flipped Course – A Go Free and Go Green Approach

**Abstract:-** As technology improves faster, Teaching faculties need to use technology to deliver the course. Using technology in well-established Institutions are easier. But for the developing institutions quite difficult to use technology as it is expensive. In this paper authors suggest few methodologies to deliver the course using online resources which are freely accessible and reduce the paper usages.

## Introduction

Traditionally, Teachers teach students using black board. Nowadays Teachers start teaching using power point presentations, audio and video materials. Teachers can make use of freely available internet resources to host their course relevant materials. Nowadays different online resources like google forms, google drives, google websites and wix websites are available. They can be used by the teachers to provide a technology advanced course delivery. In well developed countries and educational institutions it is easy to deliver a flipped course using online delivery methods. But in growing up educational institutions it is quite challenging to use online resources as they are quite expensive. This article discusses about usages of freely available resources to conduct course delivery and assessments online.

## Course Websites

Teaching faculty can create course websites using freely available resources of google websites, wix website or any free website providers. A course website which is created using wix free website providers are shown in Fig. 1.

Faculty can add the weekly/session wise notes can be scanned and put up in course website. So the students who are missing the classes can download



Fig. 1: Course website

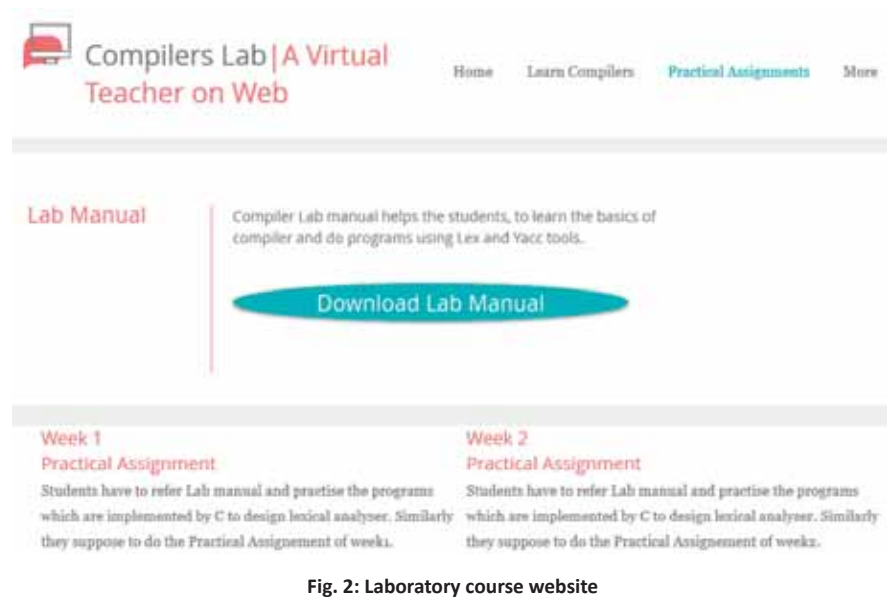


Fig. 2: Laboratory course website

from the website and study. The notifications about the course delivery and assessment can be displayed on the website. So students can easily refer them. Previous year semester end examination question papers can be added up on the website for students' reference. For laboratory courses, faculty can put the lab manual on the website. Helpful simulators and tools can be explained through the website as shown in Fig. 2. Even the video or audio lessons can be hosted in the website. They can be uploaded in youtube. And their link can be given in the course web site page.

## Mobile to Create OER-Video

Faculties can capture the videos of course explanation and launch through Youtube. By using mobile faculty can capture the video explanations. They can demonstrate their explanations over note book and capture the video themselves or with the help of someone. If the videos of short durations are available they surely help students to review the concepts they

have learnt. Videos of long durations can't keep the learners focused. They may start feel boring after some times. Instead of circulating hardcopies of class notes prepared by faculty, the videos of lessons are more useful. In Fig. 3. A sample short video is shown which is related to compiler design course. This is created by teaching faculty herself. Students referred it during their study holidays. Around 113 views are there for that video within 1 week.



Fig. 3: Short video lesson using Youtube

### Free Online Shared Repository

If any reference materials are needed to be circulated among students which is of large memory capacity, they can

during the conduction of online quiz, students cannot copy from one another. This reduces the time taken for correction, as the software helps to evaluate the

forms. Faculty can open the excel sheet and evaluate students assignments and assign grades. The final excel sheet with grades and remarks can be sent to students through their group mail ids. This reduces the paper usages in assessments and notification of grades.



Fig. 4. Shared drive of Journal papers for students reference

use shared drives like google drives. For technical paper writing components or seminars, the faculty can create share drives. In that drive they can maintain the journal and conference papers related to the course. If the students are new to do literature survey, the faculty can help the students by creating repository of this sort. In the same way, final softcopy of report documents of mini projects, seminars and technical paper writing can be submitted by students in a separate shared drive. Faculty can do the assessment of these reports by referring them online. And send their grades through group mail ids of students. This reduces the paper usages. The shared drive for students' reference for technical writing component is shown in Fig. 4.

### Assessment through Online Resources

Teachers can use resources like moodle softwares to conduct their quizzes. This reduces the paper usages. Teachers need to upload their questions and options. Moodle software helps the faculty to jumble the questions and options. So

answers automatically.

Faculty can assign practical assignments to students based on tools. By using the online forms like google forms faculty notify the students to submit their assignments and solutions online. When students submit the solutions they get stored in the excel sheet destined for the form using google

### Online Course Surveys

Faculties can conduct online course midterm surveys and course exit surveys using moodle software or Google forms. Faculty can send the link to students through their group mail ids. Students can take the survey from where they are as the survey is online. Moodle and google both of them provides the online analysis of the responses. This helps the course handling faculty to analyze the responses received from the students. Based on the survey analysis, the actions can be taken for improvement in the course. The authors have used moodle and google forms to create course exit survey and midterm surveys. Moodle and google forms can also be used for conducting surveys of Alumni students and employer surveys to measure the Program outcomes of departments.

### Conclusion

In this paper authors have suggested freely construct-able online course website, online quiz, online submissions forms and video Open educational resources. Authors use these resources to deliver the course to students. They find that the students feel easy and comfortable to use these resources for their courses. So teachers in developing institutions can use these methodologies mentioned in this paper for delivering their courses.

Fig. 5: Online assignment submission form



**Mrs. Parkavi A.** [CSI - I1500760] has completed her B.E. in Periyar Maniammai College of Technology for Women, Thanjavur. She has done her M.E in J J College of Engineering and Technology, Trichirappalli. Currently She is a Research Scholar. She is a member of CSI, IEEE and ACM. Her area of research is Social network Analysis of Outcome Based Education. She is working as Assistant Professor in Computer Science and Engineering Department, MS Ramaiah Institute of Technology, Bangalore.



**Prof. (Dr.) N. Vetrivelan** is currently working as Professor in Computer Applications at Periyar Maniammai University, Vallam, Thanjavur, Tamilnadu. He has over 20 years of experience. He has done research and awarded Ph.D degree by National Institute of Technology, Trichy. His area of interests are Wireless technologies, Mobility Models in MANET, Social Networking and Big Data.

# Creating a DevOps Methodology

**Abstract:-** Customers want IT organizations to be magicians who can deliver quick and reliable application features and yes, 'always available' too. Technology tools and people skills can automate tasks. The orchestration lies in implementing a structured methodology to deliver the expected results.

At IGATE, DevOps is a collaborative construct to bring proactive business value to customers. Using our PROVALUE methodology enables customers to adopt cultural changes, implement tools for automation and collaborative/ shared metrics collection for continuous improvement over time.

IGATE's PROVALUE methodology for DevOps offers the flexibility to choose a certain subcomponent or the entire end to end implementation. Based on the requirement of the customer, the methodology can be customized to fit the organization's needs. This white paper provides an insight into implementing a successful DevOps methodology.

## Introduction

DevOps is a philosophy, where developers and operations team work together to speed up things from development to deployment. Adopting DevOps creates an enterprise capability for continuous software delivery that enables organizations to seize market opportunities, respond more rapidly to customer feedback, and to balance the speed, cost, quality and risk factors of every application release or deployment. With DevOps, organizations can deliver a differentiated and engaging customer experience, achieve quicker time to value, and gain increased capacity to innovate.

Some key drivers for an early DevOps adoption include the need for:

- Improved quality and performance of applications
- Improved customer end experience
- Simultaneous deployments across different platforms
- Increasing use of mobile devices
- Releasing applications at enhanced frequencies

## The Need for a Structured Methodology

Organizations today face a plethora of challenges in the service delivery life cycle

- For applications with complex integration setups, creating, setting up, and deploying a new environment is costly, time consuming and prone to errors
- Due to manual interventions, moving/promoting code to the live environment involves risks and may give rise to outages
- Development teams are looking to maximize change by writing new code or enhancing the existing one, while operations teams are looking to minimize change to keep up with KPI's

ans SLA's. Both goals are opposing in nature and create a culture of blame between Dev and Ops teams

- Organizations are unable to keep Dev, Test, and Prod in synchronization due to process and tool gaps. Manual process cannot bridge this gap in consistency and thus outages in production are common

Creating a structured methodology that is relevant to your stakeholders is the key to success in DevOps engagements. Though we can leverage Agile practices, there is still a lot to put together, to enable value creation for our customers.

## Developing a Methodology

Developing a DevOps methodology involves thinking through the people, process and support elements for the

solutions. Where an organization starts with DevOps depends on its business objectives and goals – what challenges it is trying to address and what gaps in its software delivery capabilities need to be filled.

In addition to established practices like Continuous Integration, Deployment and Testing, we at IGATE observed the need for additional components like Planning, Monitoring-Control-Feedback, and Replanning for a methodology to be complete.

## Continuous Planning

Continuous Planning involves understanding business goals (as against IT goals) and following progressive elaboration based on various input parameters like schedule, feedback, and

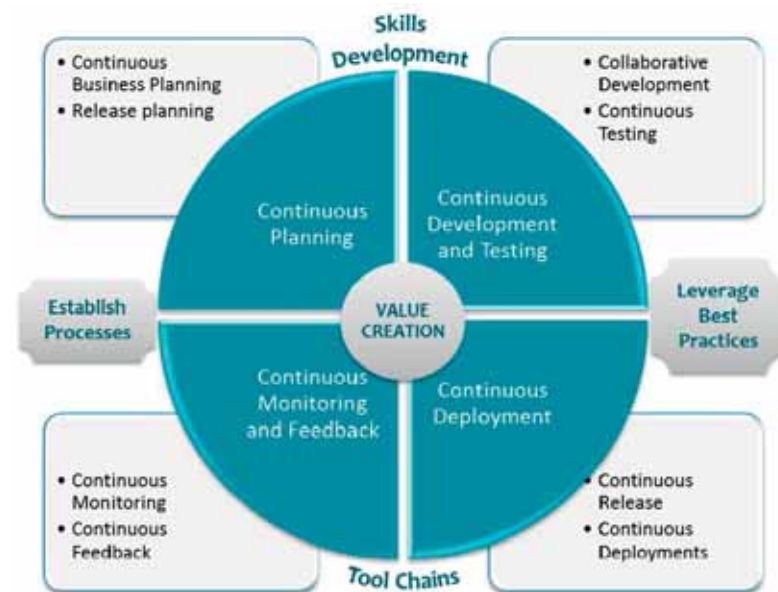


Fig. 1 : Key elements of a DevOps methodology



other risks that may affect goal attainment. As various stakeholders with differing goals are involved, the DevOps construct should resolve these opposing perspectives, helping the stakeholders collaboratively set business goals and continuously improving plans. This improves both agility, business outcomes and hence value attainment. The key essence is striking a mutual and approved balance in the service delivery journey.

#### Continuous Development and Testing

This adoption path involves two tracks: collaborative development and continuous testing. This forms the core of collaborative development and quality assurance (QA).

#### Collaborative Development

A large numbers of cross-functional teams, business owners, business analysts, enterprise and software architects, developers, Infrastructure architects, QA practitioners, operations personnel, security specialists and partners are involved to deliver software in an enterprise. One core capability included within collaborative development is continuous integration as depicted below.

- Enable ongoing testing and verification of code
- Validate that the code produced and integrated with that of other developers and other components of the application functions and performs as designed

#### Continuous Deployment

The logical next step of Continuous Integration is the adoption of Continuous deployment. The practice enables release and deployment management which enables the creation of a continuous delivery pipeline. This pipeline enables continuous deployment of software and infrastructure to QA and then to production in an efficient, automated manner. Continuous Deployment includes delivering both Infrastructure automation as well as deployment of code across environments.

#### Continuous Monitoring and Feedback

This adoption of Continuous Monitoring and Feedback includes two concepts that allow the stakeholders to monitor how released applications are performing in production and to receive feedback from customers.

use the application and feedback that those customers provide upon using the application. This continuous feedback loop is an essential component of DevOps, allowing businesses to be more agile and responsive to customer needs.

#### Re-Planning

Though this element is not placed independently in the methodology, the true value of this model is leveraged by continuous elaboration of our plans for Continuous Everything.

#### Methodology Blueprint - PROVALUE from IGATE

Based on the methodology principles discussed above and our experience in creating DevOps solutions and services for our clients, we at IGATE have developed a reference framework named PROVALUE. Large Enterprise customers deal with islands of skills, tool sets and implementation standards built internally, acquired as part of mergers or acquisitions and introduced by vendors supporting DevOps operations.

Our PROVALUE framework views DevOps as an enterprise capability that spans all stakeholders in an organization, including business owners, architecture, design, development, quality assurance (QA), operations, security, partners, and suppliers. Including all these internal and external stakeholders provides a broader perspective and a complete implementation of DevOps.

The PROVALUE solution set contains solution modules for an extensive DevOps implementation. Each of these modules solves a specific problem and has a specific goal to achieve in the DevOps implementation process. The PROVALUE methodology leverages fundamental DevOps concepts and extends them further by leveraging IGATE's Solution Enablers to provide DevOps services and solutions to our clients.

The modules included in our PROVALUE Framework include:

- C-PLAN - Proactive Planning
- C-INTEGRATE - Continuous Integration
- C-TEST - Continuous Testing
- C-DEPLOY - Continuous Deployment
- C-MANAGE - Continuous Monitoring and Feedback

#### C-PLAN - Proactive Planning

The DevOps construct aims at various

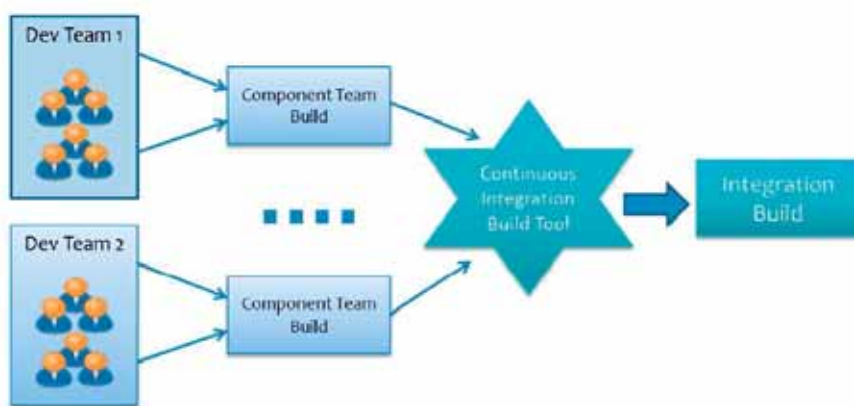


Fig. 2: Continuous Integration

#### Continuous Testing

Continuous testing promotes the concept of Shift Left which involves testing continuously throughout the life cycle, which results in reduced costs, shortened testing cycles, and achieved continuous feedback on quality early on. Continuous testing has several goals.

- Continuously test the application being developed

#### Continuous Monitoring

Continuous monitoring provides data and metrics to infrastructure operations, QA, development, business personnel, and other stakeholders about the performance of the applications at different stages of the delivery cycle.

#### Continuous Feedback

Continuous Feedback data provides the developers, QA and Ops teams with valuable data about how customers

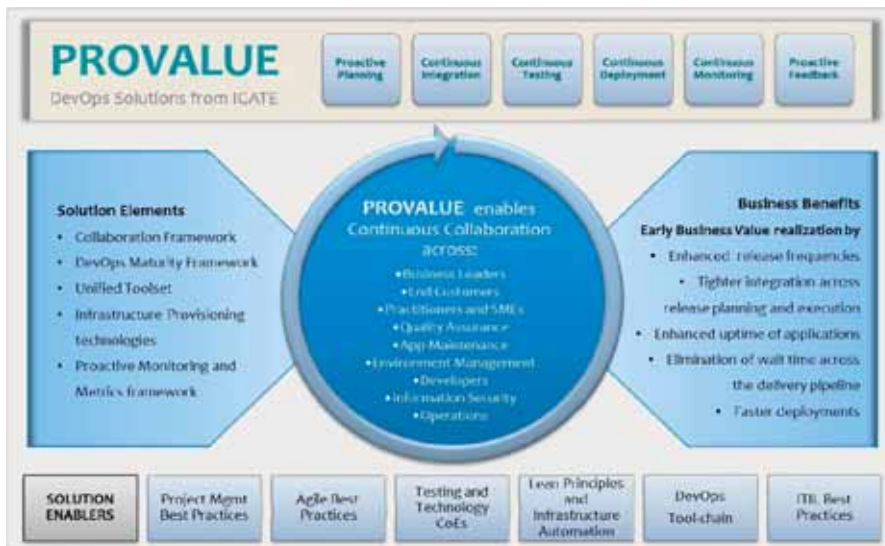


Fig. 3: PROVALUE

teams coming to achieve the customers' business goals. This requires structured planning, disciplined implementation, metrics driven feedback and continuous progressive elaboration of plans considering the opportunities and constraints. The goal is to understand what is most important to the customer in the current scenario and realign planning to achieve those objectives "visibly" quickly and proactively. - this is the core solution of our PROVALUE offering.

A good example would be release planning. Release planning is a critical business function, driven by business needs to offer capabilities to customers. Therefore, businesses require well defined release planning and engagement processes that drive release roadmaps, project plans, and delivery schedules as well as end-to-end traceability across these processes. Most companies today accomplish this task by using spreadsheets and holding meetings with stakeholders to track all business needs applications under development, their development status, and release plans. Well-defined processes and automation, however, eliminate the need for those spreadsheets and meetings, and enable streamlined and - more importantly - predictable releases. Leveraging lean and agile practices also results in smaller, more frequent releases, permitting enhanced focus on quality.

#### C-INTEGRATE - Continuous Integration

Continuous integration is the core

tenet in DevOps by allowing large teams of developers, working on cross-technology components in multiple locations, to deliver software. The core functionality ensures that each team's code is continuously integrated with the main code and is continuously validated using automated continuous testing methodologies. Continuous integration identifies issues earlier in the software development life cycle early on and thus reduces risks and the time taken to fix the code. Continuous Integration involves checking out the code from the SCM tool, creating a build at a predefined frequency and continuously testing the code and providing feedback to the developers.

#### C-TEST - Continuous Testing

The 3 tenets of for implementing Continuous Testing are as below:

- Test environment provisioning
- Test integration, function, performance, and security
- Test data management

The QA processes that projects adopt may vary from project to project, based on individual testing needs, the criticality of the applications being tested and the SLA's for the application. The 2 key tenets of Continuous Testing include Test environment provisioning and Test Data Management. These are important for projects that use agile methodologies and practice continuous integration. These apply to a lesser extent for projects that use waterfall methodology and test only once

every few months. Likewise, functional and performance test requirements differ for complex applications with components that have different delivery cycles.

#### C-DEPLOY - Continuous Deployment

As an immediate process after Continuous integration is the practice of continuous Deployment. This includes the process of automating the deployment of the software to the testing, system testing, staging, and production environments. The key to adopting Continuous Deployment in an end to end DevOps implementation is to use the same automated process in all environments to improve efficiency and reduce the risk introduced by inconsistent processes.

Continuous Deployment in all environments includes automated Infrastructure Provisioning, Configuration Management, Updating the CMDB, Refreshing test data, Deploying the application to the test environment. This is followed by the execution of automated tests that speeds feedback cycles of test results back to development.

#### C-MANAGE - Continuous Monitoring and Feedback

The Continuous Monitoring and Feedback cycle brings in a loop for understanding the inputs from end users. Feedback comes in different sources like, service desk tickets, formal change requests, formal/informal complaints, bug reports etc. With our experience in managing projects and programs, we have developed expertise in setting up monitoring feedback loops back from the Ops, QA or Development functions. With the popularity of social media and app stores, businesses need welldefined processes to absorb the feedback from myriad sources and incorporate them into software delivery plans. Ideally, if we identify and focus on the critical few performance drivers, incorporating immediate feedback becomes easier. Continual improvement programs leverage tools like Pareto charts to arrive at these performance drivers. These processes also need to be agile enough to adapt to market and regulatory changes.

#### Methodology Mapping with Maturity Levels

Another key element of IGATE's PROVALUE Offering is the Maturity Model, represented below. An initial

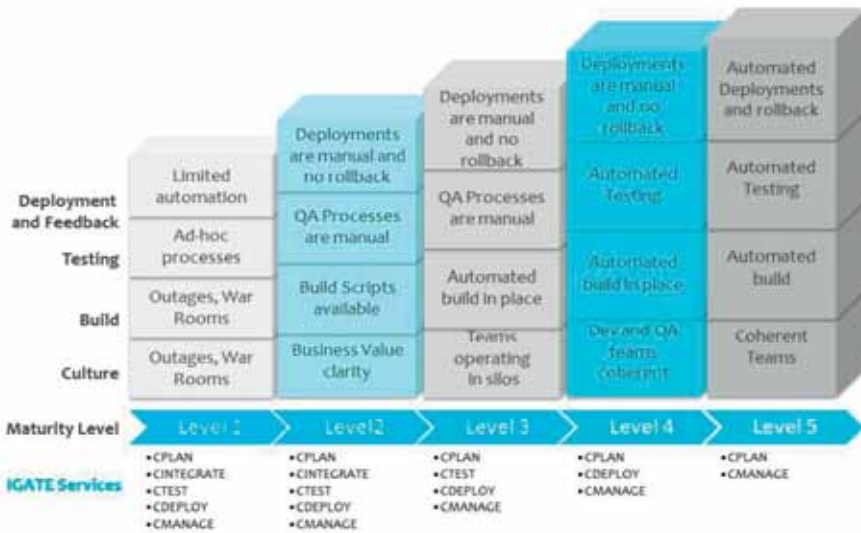


Fig. 4: DevOps Maturity Model

exercise is to quantify the maturity level of an organization's DevOps practices and characteristics on a progressive scale. Based on this assessment, we make actionable recommendations for improvements in alignment with the customer's objectives and strategies

for a DevOps solution or process implementation.

The results of leveraging the maturity model indicate the quick wins that customers can realize.

Some of these are through

- **Build Automation** - Continuous

Integration, Good Coding Practices, Configurability and Maintainability

- **Test Automation** - Unit, Performance and Integration testing automation
- **Deployment Automation** - Deployment as a package, Infra as Code, Rollback And Recovery
- **Monitoring and Correlation** - Monitoring, Bug tracking and reporting

For longer term value realization, we establish the Planning and Feedback loops under the CPLAN module. This module is the basis of value creation regardless of the maturity level.

#### Formalizing your DevOps Tool Chain

Speed and agility is enhanced with the adoption of modern tools. These tools allow for shared code repositories, containerization, automation and one click deployments.

With the implementation of the end to end tool chain, the immediate benefits realized are

- **Control:** End to end deployment workflows governed through change management process
- **Efficiency:** Automation and

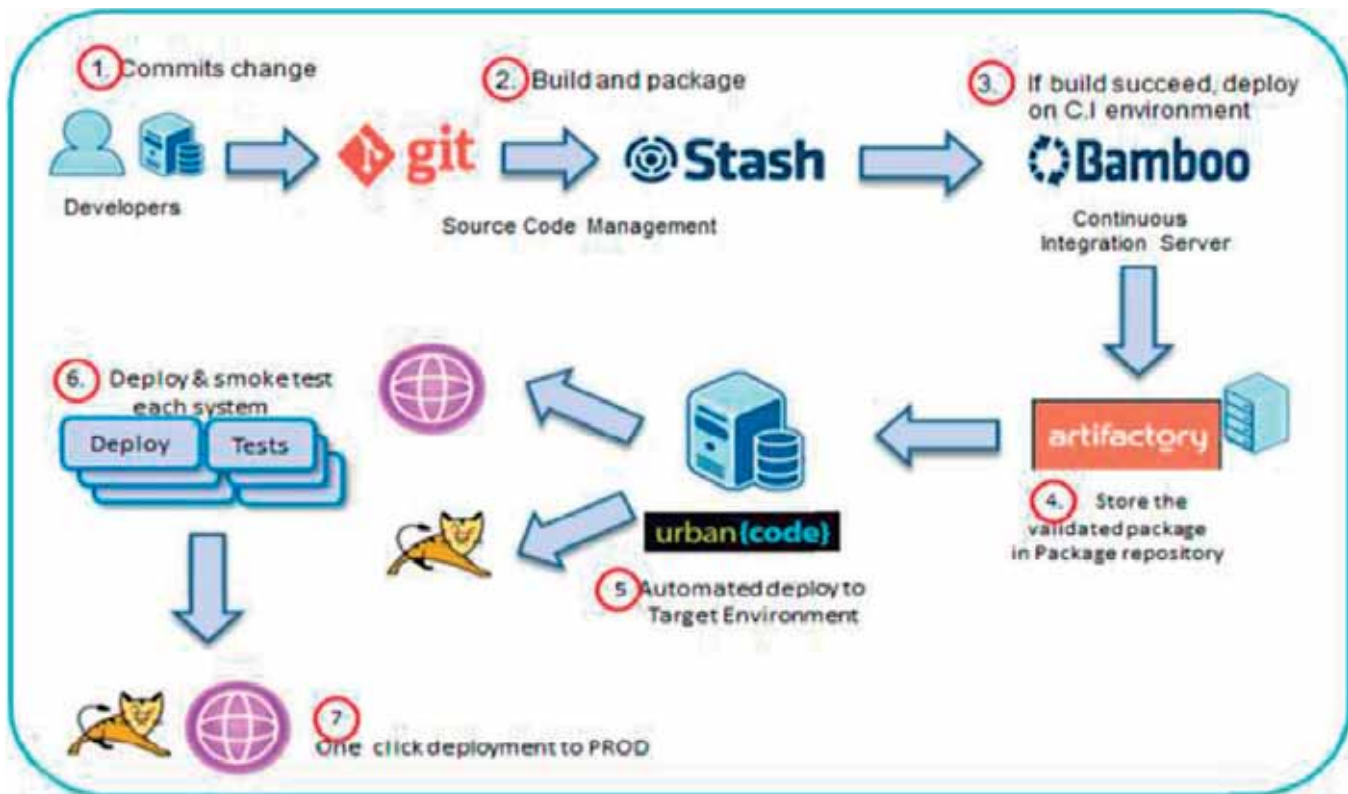


Fig. 5: Sample DevOps tool chain implementation



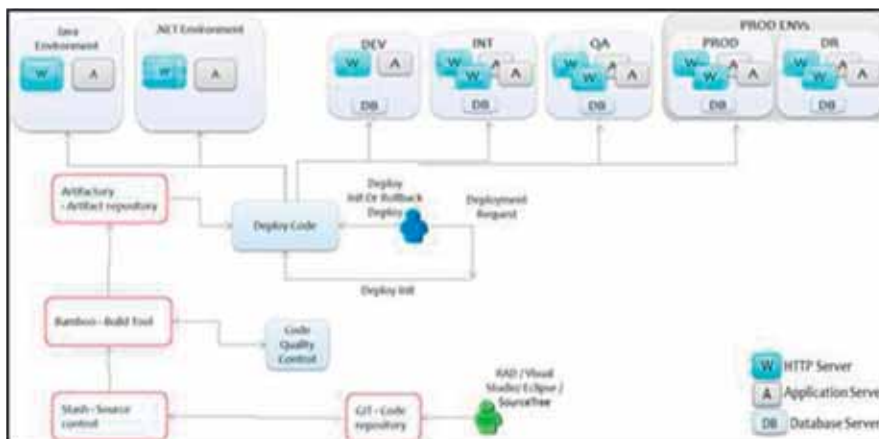


Fig. 6: DevOps Deployment Architecture

integration to improve application turn-around time across environments

- **Standardization:** Streamlining of deployment process and improve quality of scripts and integrations

Maturing the tool chain along with implementation of the methodology are critical to achieve speed of deployments and enabling collaboration, thus eliminating wastage of time, waiting for the next steps to happen.

Metrics	Description
Total Build Time	Indicates the total time taken to run all the builds (including inspection, functional, non-functional build).
Successful Build Rate	Total number of successful builds per release cycle
Version Control System Load Time	Indicates the time taken to check out/ update the project from the continuous integration build. It gives pointers about the network bandwidth, processor, memory, disk drive sufficiency and the peak time load of the version control system.
Build Repair Rate	Indicates the time taken to repair a failed build.
Deployment time	Indicates the time taken for deployment to 1 environment within the specified release window

Table 1: DevOps Metrics

### Methodology Implementation

The starting point for a Methodology implementation is to review and align it to the Deployment Architecture being followed or created for the target organization. After an initial pilot, it is advisable to formalize the tool chain and

workflows for various target environments of our clients.

### DevOps Metrics

Planning and re-planning requires qualitative and quantitative feedback in the form of metrics. These can then be used to focus on the improvement areas like Build Optimization or enhancing the performance of the Continuous Integration processes. With CI as an example, some of the key metrics indicators that can be obtained from CI stack measurements are as follows:

Parameter	Observation
Productivity Improvement	The deployment time from the time the code was checked in to GIT to the final deployment on WAS - less than 10 minutes for the sample app.
Build Triggers	The CI Build tool is configured to poll the repository at a fixed interval or can be scheduled for a particular date/time
One click deployments	The deployment can be automated or can have a 1 click deployment configuration
Build versioning	The build created by the Continuous Integration server can be versioned automatically and stored in the Artifact Repository

Table 2: DevOps Metrics

The initial benefits of a DevOps implementation appear to come from automation and tools, however they can be sustained only by systemic changes and maturing the methodology.

### Conclusion

PROVALUE is IGATE's DevOps Methodology & Framework for Software Development and Deployment. In the journey towards adoption of DevOps, PROVALUE enables customers to adopt cultural changes, process changes, tools for automation and collaboration/ shared metrics collection for iterative improvement over time. For each of the PROVALUE modules Planning, Integration, Testing, Deployment, Monitoring, and Feedback there are specific solution enablers /best practices drawn from IGATE's vast IT service experience in Project Management, Agile Methodology, Testing, Lean & Six Sigma, Infrastructure Automation, and Automated Tools for Development. Further, PROVALUE includes a maturity model that includes aspects related to Build Automation, Test Automation, Deployment Automation and Streamlined Feedback that enables organizations to benchmark themselves



in their journey towards DevOps adoption.

Our PROVALUE methodology has already demonstrated value for our customers, even in off-shore centric projects. While automated tools for development and deployment play a significant role in the adoption of DevOps, it is equally important to overcome the cultural/ process challenges for sustainable success and superior business value. The tools /

methods/ processes available for development/ deployment, whether open source or commercial, are likely to evolve over the next few years as this movement catches steam. IGATE's ability to get its workforce skilled in these tools/ methods and create a scalable resource pool for providing services using this methodology will continue to be a key differentiator that our customers can bank on.

#### Notes on use of Terminology and Product Names

1. Use and Reference of product names are only indicative. The purpose is to demonstrate the concept of the methodology and its implementation
2. All Product Names, Logos, Framework terminologies belong to their respective owners

About the Authors



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**Shrinivas Sathe** is a Senior Manager at IGATE with over 18 years of experience in the IT Industry. He has worked with multiple Fortune 100 organizations with an emphasis on establishing and improving their Enterprise Architecture Practices. He has developed technology reference architectures and a review framework that encourages adherence to Organization standards. Shrinivas is the key Senior Architect in IGATE's DevOps practice and responsible for developing POCs' tool chains and solution offering for IGATE's clientele. He can be reached at [Shrinivas.Sathe@IGATE.com](mailto:Shrinivas.Sathe@IGATE.com)

## CSI CHAPTER ELECTIONS 2016-2017/2018

Call for Nominations for CSI Elections for the year 2016-2017/2018 will be announced in the September 2015 issue of CSI Communications. Chapter Nomination Committee shall invite nominations for the following positions from their respective eligible voting members. For details on election process, schedule and eligibility etc., visit the chapter website. In case you wish to update your details, please write to CSI HQ for updation.

### For the term 2016-2017 ( April 1, 2016- March 31, 2017)

- 1) Vice Chairman-cum-Chairman Elect- One Post
- 2) Nomination Committee (3 members)- 3 Posts.
- 3) Managing Committee:(4 / 6 / 8 members as per class/category of chapter)

Category A - (Chapters having more than 500 members) - 8 MC Members.

Category B - (Chapters having 250 - 500 members) - 6 MC Members.

Category C - (Chapters having less than 250 members) - 4 MC Members.

### For the term 2016-2018 ( April 1, 2016 - March 31, 2018)

- 4) Hon. Secretary - One Post

Chapter election process must be completed by 15<sup>th</sup> November 2015 i.e. the election slate/ results must be communicated to CSI HQ at [hq@csi-india.org](mailto:hq@csi-india.org) by chapters by this date. If required, elections would be held online along with National ExecCom elections.

All queries/ doubts pertaining to chapter elections can be mailed to respective Chapter NC. In case of any difficulty you can also write to National NC at [nc2015\\_2016@csi-india.org](mailto:nc2015_2016@csi-india.org) with a copy to CSI-HQ at [hq@csi-india.org](mailto:hq@csi-india.org)

**National Nomination Committee (2015-2016)**

## Programming.Tips() »

# Taking Screenshots in Java

```
import java.awt.image.BufferedImage;  
import javax.imageio.ImageIO;  
import java.awt.Rectangle;  
import java.awt.Dimension;  
import java.awt.Toolkit;  
import java.awt.Robot;  
import java.io.File;
```

```
class ScreenshotDemo  
{  
    public static void main(String[]  
args)  
    {  
        try  
        {  
            Robot robot = new Robot();  
            int index=0;  
  
            while(true)  
            {  
                Thread.sleep(5000);  
                Toolkit Tool = Toolkit.  
getDefaultToolkit();  
                Dimension ScrnSize = Tool.  
getScreenSize();  
  
                Rectangle Rect = new  
Rectangle(ScrnSize);  
                BufferedImage ScreenShot = robot.  
createScreenCapture(Rect);  
  
                File ImgFile = new
```

```
File ("Screen"+index+" .GIF");  
                ImageIO.write(ScreenShot ,  
"gif", ImgFile);  
                count++;  
            }  
        }  
        catch(Exception E)  
        { E.printStackTrace(); }  
    }  
}
```

### What Does the Program do?

In every 5 seconds, this program captures screenshot of the system and saves it as an image. When run in background, such programs can be useful to check the activities performed on your system in your absence.

### Description

The java.awt.Robot class provides functionality to capture screen through its createScreenCapture method, which takes a java.awt.Rectangle type of object. In our example, the size of Rectangle object that we have passed to this method is equal to the screen size of the system. We have used an infinite while loop so that the program runs constantly along with the static sleep method of java.lang.Thread class to pause the execution of program for 5 seconds each time the while loop executes. Every time the screenshot is captured, it should be saved with a different filename therefore the filename is generated dynamically with the help of an integer variable index, which increments each time the loop executes. By appending the value of index within filename, we are able to generate a new filename with which the current screenshot is saved.



**Mr Vijendra Singh Bhadouria** is an Expert Trainer for Java Programming and Android. He is BE(CSE), MTech(CSE) and presently he is doing his PhD in Computer Science and Engineering. His Area of Research is Adhoc mobile Network and Cellular Communication. He has more than 5 years of experience in teaching.



**Prof Rajesh K Shukla** presently is HOD, CSE and Dean (R&D) at Sagar Institute of Research and Technology, Bhopal. He has more than 17 Years of experience in teaching. He has authored 8 books for Computer Science Engineering students. He is a life member of CSI and presently Secretary CSI Bhopal Chapter.

## Green Computing and Security Issues

Green computing is a buzzing word in the IT sector in past few years for a substantially serious reason that abridges with futurity that may turn to be a perturbing factor for the succeeding generations if not planned and given due concern today. Given the quantity of indisputable E-waste being generated across globe, the concern is actually flagitious. A report brought out by the UN University has divulged that in 2014 alone, a brobdingnagian approx 42 million tonnes of E-Waste has been yielded and of it only 7 million tonnes could be taken in for recycling. The remaining 35 Million tones stays around with us endangering the current environment and escalating health issues for future generations. And I must repeat to say that this 42 million of E-Waste is attributed to 2014 alone ie only one year. Developed countries who have realized the reverberations early have been dumping E-Waste in developing and under developed countries who are accepting it in turn for a monitory benefit or development promises and at times even in the name of charity.

Additionally to above, from a carbon foot print of view, a single desktop today consumes 200-300W of power, and even with economic power saving modes set, still results in emissions of nearly 220Kg of CO<sub>2</sub>/annum. But using more energy efficient systems, this level of CO<sub>2</sub> could be brought down by almost 70% ie down to a mere 70Kg / annum. Imagine the world wide impact if we are talking of one single PC desktop here. The effect of reducing PC power consumption here is not simply bound to effecting the reduced emissions but also it would affect relative paraphernalia of air conditioning etc that is being used to cool down the work place where the co-occurrent heat is being generated too.

Whatever be the current situation and policies, the current scenario needs to stop generation of this walloping E-Waste and threatening carbon footprints and necessitates a solution that slays this emergence holus-bolus. The answer to this has come in the form of Green Computing that refers to environmentally inviolable use of IT resources viz Storage devices, Motherboards, Display units, Printers, Networking peripherals with no impingement on the environment. The rationale behind green computing is to economize power utilization by exploiting

current possibilities in software's to minify utilization of the hardware resources, effectuation of energy-effective IT hardware and peripherals as well as abbreviated resource consumption and disposal/re-cycle of E waste aright.

Now further to this, having built up on the necessity and basic understanding on the indigence of and significance of green computing, I would colligate the rationale of green computing with the Security domain. At the onset anyone amply clear on green computing may not be able to relate of what Information security domain has got to do with green computing, but alas there is a connect as I decipher ahead.

Preponderant features of Green Computing demand consolidation and all advantages that cloud computing currently and promise to offer in future. These two terms are actually auxiliary to each other and offer a superfluity of advantages for the common IT user. The following conterminous advantages are offered and envisaged:

(a) Economies of scale provisions increased volume output and productivity with lesser hardware and fewer people. Subjugated hardware allows for a reduced carbon foot print.

(b) Reduced expenditure on technology infrastructure allows Pay as you go based on customized user demand further contributing to abbreviated carbon foot print.

(c) Streamline processes owing to clouds set up commissariats to get more work done in less time with lesser hardware.

The above keyed out advantages are few of the many that effectuate to a reduced carbon print. Adverting about consolidation, Server consolidation relates to the efficacious usance of computer server resources to abridge total servers or server locations that an organization may be working on at dispersed location. The concept came into existence owing to observations including nether-exploited servers seizing on more space and consuming resources than can be absolved based on the workload. Virtualization allayed all this as it came to the fore and resolved the question of why use 20 servers at 15-20% CPU utilization, whilst 3-4 running at 75% will do the same job?

The above discussion on first how to reduce E-waste, then how to use energy

efficient systems logically reasoning to Green Computing and then further looking towards Cloud Computing, Virtualization and Consolidation as solution to implement green computing brings somewhere to a happy ending scenario but alas all this is not so easy. The thing about these technologies is though the technologies may be ready to be implemented and tapped, the user majorly still stands in doubt owing to the security issues associated with these promising technology giants. The established IT security controls presently configured across organizations will not stand to recognize malicious traffic passing between virtual machines (VMs) and cloud environs. The ease and flexibility that a typical VM offers for a user becomes a vulnerability if one VM is compromised for all across VMs.

Few pertaining issues relating to these promising technologies are discussed below :

**Shared Technology Issues:** Scalability is one of the key features of cloud computing as this allows a user to demand flexibly be it hardware or software or an application access for few hours ie pay on the go for every IT component being used which was hitherto unheard. Now though implementable by design for meeting the user requirement, the rudimentary constituents here that conciliate the desired and workable infrastructure is not planned to offer impregnable isolation properties for either IaaS(Infrastructure as a service), PaaS(Platform as a Service), or SaaS(Software as a service), and thus shared vulnerabilities and threats continue undeterred to subsist in all delivery models. One single vulnerability can be exploited by criminals to compromise across an entire provider's cloud.

**Data Breaches:** An improperly designed and configured cloud service database will not just be a security hazard for the client but also could allow an attacker access to every other client's connected data as well that might affect third parties too. This can spell a nightmare for the key stake holders involved in the organization and the risk is too large to take on for any organization because of the stiff competition and economies of the market today.

**Insecure APIs:** Cloud Service Providers (CSPs) are exposed by "weakly

designed for security” application programming interfaces(API) and thus attackers exploit existing vulnerabilities in these APIs to compromise the confidentiality and integrity of the users. The associated security vulnerabilities of these APIs are in fact responsible for the state of security in a cloud setup justly from access control and authentication to encryption and traffic monitoring.

**Malicious Insiders:** A malicious insider who may be a system admin with all root privileges in a badly configured cloud setup will have a default access to all classified information ranging from SaaS to IaaS and PaaS. This malefic insider has all the time and access to critical systems, leading to breach of valued data. Thus those systems and multiple clientele which are actually availing and dependent on the CSP for their own security stand at a greater risk for any incident.

**Cloud Services Vilification:** The inherent advantage of the cloud services being easily available to any user with low investment is a boon though for a genuine

user but at the same time a bane for the authorities who find an inflated escalation in cyber crimes since potential of cloud services has been realized by cyber criminals too who take the benefit of lack of standards and technology in forensics to be traced back.

**Insufficient Due Diligence:** Lack of due diligence remains as one of the acme menaces to cloud computing. While users may have a cognizance of the cloud technology and related security threats, many business undertake little due diligence about their cloud service providers (CSPs). Even basic due diligence, such as assessing the financial health of the CSP or determining the length of time the CSP has been in business, are frequently not considered leave aside the concern for security standards and policies being followed by the CSP.

Besides these few threats and issues discussed above other imminent severities include Data Breach, Data Loss, Account Hijacking, Denial of Service, Lack of standards, Complex SLAs etc. Cloud

computing, Virtualization and Server consolidations all have such common listing of threats which may be few but are potent for any corporate to avoid take on since the degree of risk involved is much higher by any standards.

So the technologies available today may be able to incarnate basic qualitative necessities required for Green Computing but they all come with a hidden clause potentially dangerous and that's Security. Today times exists when just in the name of security any serious ear in an organization gets attentive, major industry are already pumping millions into this domain which is still in naive stages towards maturations which is still long way to go given the current pace seen in last few years.

Green computing undoubtedly is the need of the hour but before any organization makes necessary amends to adapt Green Computing, it must take into consideration the proneness it proffers to the existing security vulnerabilities and unknown zero days exploits.

About the Author



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# Cyber Security and Social Media

## Introduction

In the era of digital world, all economy, governance and business routines depend on information solution based on computer networks. Threats and attacks are also increasing to destroy an information solution available through computer networks. According to cyber terms a threat is generating possible harm to security by exploiting vulnerability and attack to get illegal access to depiction, demolish, immobilize, modify, and lift sensitive information.

There is a very long history of cyber threats and attacks but we are going to study a single decade with versatility of attacks and threats.

In 1988 the first worm has been recognised. It has been used to affect and spreading infrastructure largely at US. This worm has been used to weaken the UNIX operating system and simulated to itself frequently. Because of this worm the performance of system becomes very slow and system unusable. That work was done by Robert Tapan Morris, and he said that he was just trying to measure the big size

found as well as reported many cyber attacks against its agencies including defence research and development at Canada. In July 2011, DoD (Department of Defence) at US mentioned that a defence contractor has been hacked by someone and near about 24,000 files have been stolen from Defence.

In October 2012, Kaspersky, the Russian firm, discovered "Red October" which was functioning since 2007. The vulnerabilities of Microsoft Word and Excel programmes were used to gather information. Firstly, they have targeted Eastern Europe countries, central Asia, Western Europe and reached up to North America as a victim. The virus and worms collected all information from embassies of government, firms of research, installations of military, and providers of energy, nuclear with other critical infrastructures.

In March 2013, Korean broadcaster YTN with South Korean financial institutions, had their networks contaminated. It was said to bear a resemblance to past cyber efforts by Korea.

In June 2013, NATO has extended protection to the networks which has owned by Alliance at cyber-defence.

In October 2013, a new computer virus dubbed "Red October", that targeted eastern European countries and appeared to be collecting classified files using NATO and EU encryption was identified.

## Topmost Social Media Threats and Attacks

According to general information available on internet, 82% of employees of any organization are using Facebook, 62% and 46% are using blogs and micro blogs subsequently, 69% are using GTalk and 61% are using messenger of Yahoo.

Here, paper discusses methods of attacks and topmost key social media threats:

### ❖ Social Engineering Threat

Presently, social engineering is very famous threat for cyber criminals. It allows attacker to find out personal information of any individual. Attackers are making this happen by using information available online or from company database, by using fake account and create trust over the time. After getting trust from user, attacker

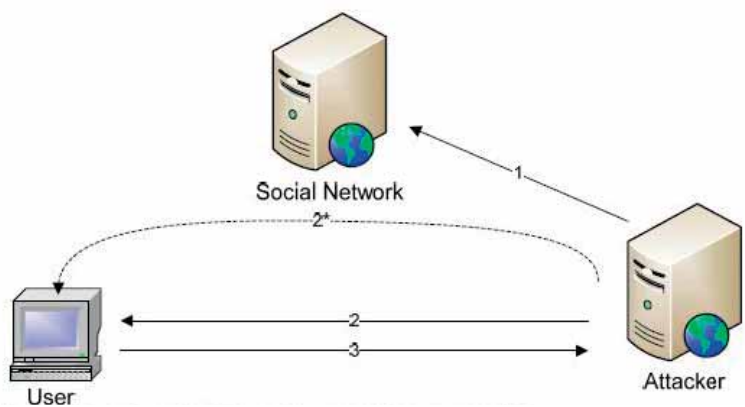


Fig. 1 : Attacks of User on Social Networking

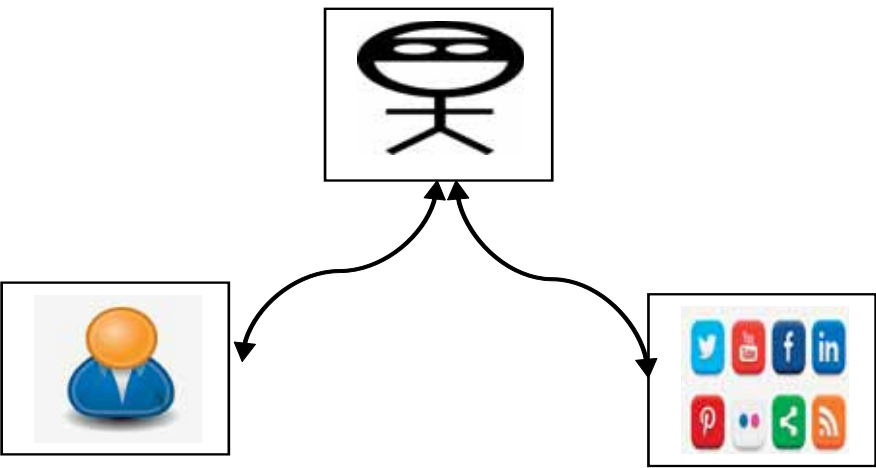


Fig. 2 : Social media attacks

The history of cyber threats and attack is very interesting and here we have described only those threats and attacks which have been reported by authorities including government and cyber military.

of an internet. He consequently became the first fellow to be booked under US computer fraud and abuse act. He is now doing work as a senior professor at MIT.

In January 2011, Canadian government

starts to collect personal information of individual by asking him/her. Information includes name of project people are doing, name of server on which they are working and go through website which drop a backdoor to their computer.

#### ❖ **Embattled Phishing**

Especially for stealing money or confidential information this attacks are carried out. The case of Hydraq attacks, in these initial of 2010, compromised multinational companies' essential information. Using system vulnerability, attackers develop fright and unease instead of, to get users to part with their money and this is very specific and targeted attack and its chances are more to get success.

#### ❖ **Bogus Accounts**

The most grave social media threats gets emphasized when fake or bogus account has successful connection with so many people of various institutes, corporate and specially military, government and security firms. The best example of this was July 2010, Robin Sage – a faked profile pressed request to people randomly and people were accepting without knowing.

#### ❖ **Exploitation of Celebrity Names**

Today, this is most popular. This is the best way to spread rumours and misinformation as well as to attack followers which can spam. There have been various occurrences when hacker is creating account by using name of celebrity. For example, Fan club of Angelina Jolie. Attacker is extracting individual's personal information to misuse it. There is no real authentication or identity check to protect against such kind of threats.

Apart from above there are conciliation of websites, dissemination spams and malware and reveal of confidential information also part of topmost social media attacks.

### **Classification of Threat & Attacks on Social Media**

#### ❖ **General Web Attacks**

Web is very popular and inevitable part of human life now a days. In this, social media plays very pivotal role. Here, we're giving description in brief about general web attacks studied in 2008-09. There are topmost 7 threats on social media website.

- Drive-by downloads from mainstream web sites are increasing.
- Attacks are heavily obfuscated

and dynamically changing making traditional antivirus solutions ineffective.

- Attacks are targeting browser plug-ins instead of only the browser itself.
- Misleading applications infecting users are increasing
- SQL injection attacks are being used to infect mainstream websites.
- Malvertisement (Ads with malware) are redirecting users to malicious websites.
- Explosive growth in unique and targeted malware samples.

#### ❖ **Malware**

Malicious software, abbreviated as Malware, is any kind of software which is used to disturb operations performed by computer. It also gathers sensitive information or gaining access to the private system. It can be in various forms includes scripts, active content, executable code and other software.

According to a survey report 70% malwares are there in social media. If we are talking about popular social media includes Facebook, LinkedIn and others, it is having figure something like below.

Table 1 : Malware Attack on Social Media

Sr.No.	Social Media	Malware Risk
1	Facebook	60 %
2	MySpace	18 %
3	Twitter	17 %
4	LinkedIn	4 %

#### ❖ **Vulnerabilities**

In the terms of computing, vulnerability is a kind of weakness which gives a way to attacker to reduce performance of a computer system. There are various types of risks on social media sites due to vulnerability. The various tactics includes Baiting, Click jacking, Cross site scripting (XSS), Doxing, Elicitation, Phraming, Phishing, Phreaking, Scams and Spoofing.

Above all types of diplomacy can be performed by taking benefits of vulnerability to social media sites.

#### ❖ **Malicious URLs**

Malicious URLs are the URLs created for malicious purposes. It can be used to download any kind of malware which is affecting to the computer. It also contained other messages includes spam, phishing. It

also improves its (URLs) position in search engines by using blackhat technique of SEO.

In malicious URLs, shortened URLs have become very popular in current a year which means protecting space in character limited text fields, such as those used for microblogging. Few URLs are with considerable number of characters which can eat up limitation of characters to break flow of text or basis twists in how pages of web caused to be of users. It allows people submission of an URL that redirects original URLs to submitted web pages.

Regular URL is: - <http://www.facebook.com>

Shortened URL is: - <http://fb.me>

### **Various Social Media threats including Spam, Scams**

Online interaction of people is creating more knotted life of them. In this case social media is the best option, out of several options provided by internet to make easy interaction with others. Regrettably, it also opens opportunities for criminals of cyber as well as online threats. Criminal of cyber with various purposes try to contact with social media users to targets for scams, spam and other various types of attacks. With content updates, status online and sharing links, images and videos as well as sending secret messages or direct messages creates possibility to exploit information of legitimate users.

#### **Initiative of attacks**

Because millions of users are available on popular social media sites including Facebook, Twitter. It is the best destination for criminals to execute their criminal activities. Generally, when user is getting log on into website he encounters various kinds of social media threats. Whenever they will try to download any page, URLs, images it triggers spamming routine. All above things are uploaded by criminals who are already having their account on these websites. However, it is not only social media wall or anything on which attacks are taking place, but it is also possible to send spam messages supposedly from legitimate sites of social media.

#### **User comes across of attack**

As all users are having various options to post on sites, same as those various

options used by attackers to create different types of threats on social media.

❖ **Facebook**

This is very simple in which criminals can post which acts as an attack. This includes celebrity talk and disasters. This kind of exciting post attacks users. Users, who are clicking on these types of post it leads to re-post malicious scripts, links, images, videos on user's wall. Some survey sites are also getting open when user likes some posts available on other's

wall which leads to profile making of cyber criminal.

Another way is that some applications lead users to play games, to add features of profiles and allow more stuff. Basically, anyone can develop this kind of applications and submit which can be accessed by users. So, criminals of cyber can also use this kind of opportunities to create spam or phishing attacks which are known as rascal applications.

The other types of attack by Facebook

are done by chat features available in that. Messages coming in chat, are used to spread application like phishing and malware spreading which means the same which we have discussed above.

❖ **Twitter**

Twitter is having limitation of 140 characters for twitting any kind of message. Twitter name itself gives explanation by its name that it is for short message only. Criminals of cyber are using this limitation of short messages to post

Table 2 : Ways to defence various social networking accounts

Point	How to defence on Facebook, Google+ and Twitter
Application checking with setting to avoid much sharing of information	<ul style="list-style-type: none"> <li>• <b>Facebook</b> Visibility of application activities should be controlled on your timeline as well as nourish via section of apps from privacy settings. Furthermore, manage or remove individual app settings. You can just alter settings of privacy of these ads at the time when you can't opt out sponsored post.</li> <li>• <b>Google+</b> Handle app visibility or delete through the Apps and Activities segment.</li> <li>• <b>Twitter</b> When third party trying to access your apps you can revoke them through apps section</li> </ul>
Privacy checking policy with adjusting setting at your comfort level	<ul style="list-style-type: none"> <li>• <b>Facebook</b> Data usage checking via page to see about avoidance revealing your Personally Identifiable Information (PII).</li> <li>• <b>Google+</b> Opt out of revealing PII is not allowed by site. User can check principles and polices on Google page.</li> <li>• <b>Twitter</b> Individual user can withdraw PII by applying polices available on Twitter.</li> </ul>
Keep tabs on mentioned tags	<ul style="list-style-type: none"> <li>• <b>Facebook</b> Provide reviews to tags on photos before adding it on to your timeline. Manual removing is also there.</li> <li>• <b>Google+</b> Provide Approve and remove tags on images or perform it from setting.</li> <li>• <b>Twitter</b> We can provide username setting replies.</li> </ul>
You have to make sure your intended audience to see your post.	<ul style="list-style-type: none"> <li>• <b>Facebook</b> Do not allow setting of "Friends of Friends" in which you never know the tree creation of your post watch.</li> <li>• <b>Google+</b> Sharing of list of people facility is available in circle of Google publicly to check largeness of your audience.</li> <li>• <b>Twitter</b> You can include Twitter list in which you can share that list publicly.</li> </ul>
Deletion and Deactivation of your account	<ul style="list-style-type: none"> <li>• <b>Facebook</b> Deactivation allows your account reactivation later where as deletion is permanently deleting an account.</li> <li>• <b>Google+</b> Deletion is quite complex as it is connected with your other account of Google.</li> <li>• <b>Twitter</b> Twitter waits for 30 days after your request for permanently deactivating your account. After deactivating your account content might be still available for upcoming few days.</li> </ul>

links or short post. For example, recharge vouchers, advertisement of job and products and many more. These kinds of promotional things makes easier to spam.

In Twitter individual user can upload link also related to malware. It tricks to promote fake applications and backdoor applications. Worm of Twitter also affects Windows and Mac OSs. The fake YouTube page links are available and user click on it which leads to blackhat SEO attacks. The most common this type of attack is KOOFACE. It is not only at Twitter but on Facebook also. This type of attack is having tactic of social engineering in which they use post related to video. This all is based on current trends.

Another foundation of a cyber criminal is to control zombies' botnet. It compromises performance of machines infected by worm. It can be controlled by botnet. By using site of microblogging are having some benefits and drawbacks also but it is very interesting to study it.

#### Affect of attacks to users

Malware, spam, phishing and other attacks are very challenging for social media in which they have to keep secret of user's profile and information. The final goal of social media is to enable another user to access information of one user and provide communication among different users as well. Unluckily, criminal of cyber are going through this information of users, which are publicly available, and used it for targeted attacks.

Some of the users are having such kind of perceptions that cyber criminal will not get any benefits from their information. In this case user can't realize that attackers can get access of individual's account. Cyber criminals can easily find out the way to explore more information to access anyone's account. The same things are related to corporate accounting system. The best example of that is Linked In.

#### Social Media Defend Privacy with Discussion of Various types

To keep your privacy and to defend from

attacks and threats of social media is not much easy task. Individual can only limit certain types of attacks. At the time of sign up automatically attacks and threats are taking place.

There are various ways to defend or prevent various attacks and threats towards social media.

#### Preventing Spam, Scams and other Social media attacks

Some basic measures of precautions are there to avoid becoming victim of threats of social media. User should identify a bogus notification which takes the appearance about legitimate prompts from the exacting website of social media.

When individual user is trying to browse profile online that time user should keep in mind that everything which is available on the page is not at all safe. Cyber criminals are constantly waiting for opportunities to attack on any legitimate user of social media and their information. There are always some virtual corners at where social media threats are waiting for stinking activities.

Furthermore, individual user should be enough experts to protect their data and its privacy as well. It would be best to accept and make mindset that information which is posted online is publicly available. Apart from these carefulness when legitimate user is posting data online and sharing personal information at the same time he or she must be familiar about the sensitivity of the data and confidentiality of the data and information. One must not share sensitive business information as well via private chat messages also. It is just because of when account is going to hacked by hacker they can get all information about that individual's business information.

In addition, to prevent this, user must be aware about the security settings available in any social media websites which are helpful to protect their information available on social media websites.

For example, Facebook allows users to create list from their side and use

that list to control the different types of information which can be available to the people who are belonging to the particular category of list. At last, individual can enable secure connection option in which uses HTTPS instead of simple HTTP. HTTPS is the combination of HTTP and (Secure Socket Layer) SSL. In HTTPS pages coming from social media like Facebook, LinkedIn or Twitter are adding some protection layer by providing encryption to the data of pages.

#### Future of Cyber Security on Social Media and Conclusion

The cyber security with respect to social media is having many issues related to threats and attacks which require solving to get better cyber access to human being.

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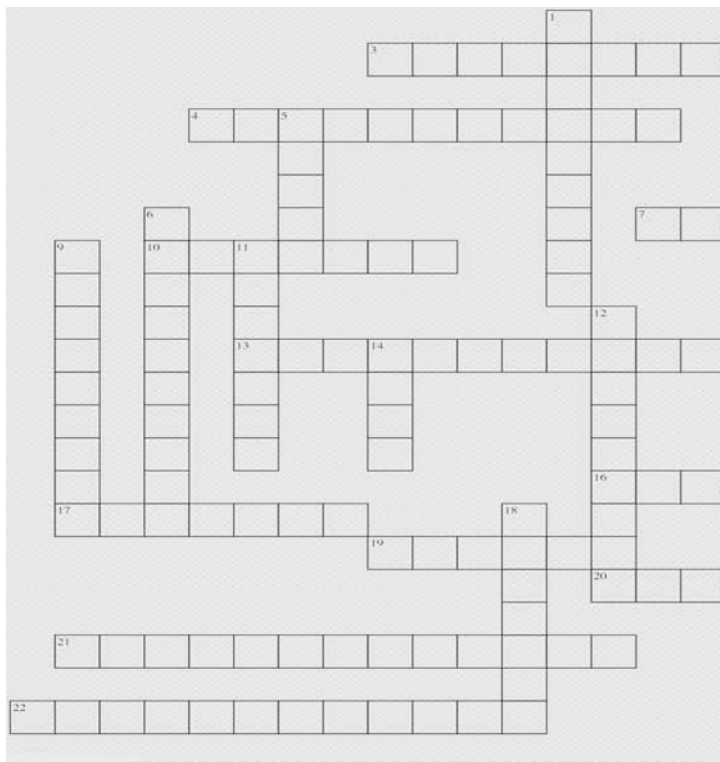




## Crossword »

### Test your knowledge on Emerging Trends in IT

Solution to the crossword with name of first all correct solution providers(s) will be appear in the next issue. Send your answer to CSI Communications at email address [csic@csi-india.org](mailto:csic@csi-india.org) with subject: Crossword Solution – CSIC August Issue.



### CLUES

#### ACROSS

3. The chemical dissolution of materials by bacteria, fungi, or other biological means.
4. Able to be maintained at a certain rate or level
7. A miniature cylindrical carbon structure
10. Organic matter that has been decomposed and recycled as a fertilizer and soil amendment
13. A practice to increase mileage in vehicles
15. One of the toxic metals used in manufacturing
16. A self-sufficient environment formed by biological and physical characteristics.
17. A world leading information technology research company
19. A virtualization software provider
20. A place to bury wastes
21. Working from Home
22. Surfing using an inverted palette

#### DOWN

1. Chemical that stop plants from growing
2. Array of disks which do not experience much activities
5. A mode the device enters when not in use
6. A mechanical device used to reduce energy consumption
8. Waste water
9. Converting into reusable material
11. One of the greenhouse gases
12. A non-petroleum based diesel
14. Date and Time in a computer
18. Temperature increase in air and ocean because of human activities

### Do you know about BEE Star Rating?



Bureau of Energy Efficiency (BEE) is established by Government of India as a statutory body under ministry of power for energy conservation. It provides labels to products/buildings based on how energy efficient they are. More are the stars coloured on the strip more efficient is the product. It also indicates total number of units consumed by the equipment in one year. The BEE logo at the bottom indicates authenticity of the logo.

Rashid Sheikh  
Associate Professor, Sri Aurobindo Institute of Technology Indore

We are overwhelmed by the response and solutions received from our enthusiastic readers

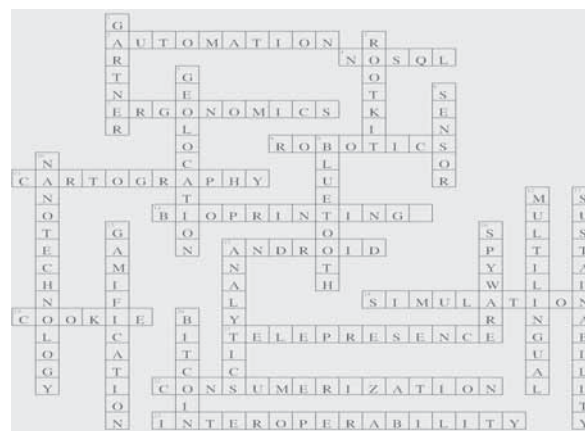
### Congratulations!

All Correct answers to July 2015 month's crossword received from the following readers:

**Mrs. Smita Saxena** Assistant Professor, University of Pune, Pune

**Er. Aruna Devi** Chartered Engineer, Surabhi Softwares, Mysore

### Solution to July 2015 crossword



## From Chapters and Divisions »

### Report from Vellore Chapter

CSI Vellore Chapter initiated a pilot project called "E<sup>2</sup> : Digital Awareness Programme" for Govt School Teacher's in an around Vellore to educate the educators. Educators are the catalyst to enlighten the minds of young children in government schools, which will have impact on the future generation of India. This workshop was organized from 18/05/2015 to 23/05/2015. The following topics were covered MS-office, E-mail and Content browsing features. This event was coordinated by Prof. G. Jagadeesh, Prof. K. Govinda.



CSI Vellore Chapter organized a Guest Lecture on "Component Based Software Engineering for SOA" on 18/6/2015. Dr. Muthu Ramachandran from Leeds Beckett University, UK explained about structured programming concepts, object oriented concepts with UML and component communications in SOA. This event was coordinated by Prof. G. Jagadeesh, Prof. K. Govinda.

### Report on International Conference on ICT for Sustainable Development (ICT4SD - 2015)

**3 - 4 July 2015, Ahmedabad**

International Conference on ICT for Sustainable Development in concurrent with ICT Awards The EXCELLENCIA was held during 3-4 July, 2015 supported by Computer Society of India as a Knowledge Partner. This conference provided the participants with opportunities to discuss and explore areas related to the Theory, Development, Applications, Experiences and Evaluation of Interaction Sciences with fellow students, researchers and practitioners. The conference provided a platform for bringing forth significant research and literature across the field of ICT for Sustainable Development and provide an overview of the technologies awaiting unveiling. This interaction provided a focal point for leading experts to share their insights, provide guidance and address participant's questions and concerns. The Plenary Session Speakers and Guests included Mr. Job Glas, Head of Mission, NBSO, Netherlands, Mr Volkmar Blech, Zera GmbH, Germany, Dr. DURGESH Mishra, Indore (Chair-Div 4) Dr. Mukesh Kumar, TITS, Bhiwani, Dr. Vipin Tyagi, Jaypee University, Guna (RVP-Region 3), Prof. Pravesh Bhadviya, Director, Sabar Education, Mr. Bipin V Mehta, President CSI, Mr. Hemal Patel, MD, Cyberoam, Ms. Bhagyesh Soneji, Chairperson, ASSOCHAM, Mr. Jay Ruparel, President, GESIA. A total of 18 Sessions were organized as a part of ICT4SD including 15 technical, 2 plenary and 1 Inaugural Session. A total of 127 papers were presented in the in 15 technical session with high discussion insights. The total number of accepted Submissions was 155 with a focal point on ICT. The Session Chairs for the technical sessions were Dr. Chirag Thaker, GEC, Bhavnagar, Dr. Vipin Tyagi, Jaypee University, Guna, Dr. Munesh Trivedi, ABES Engineering College, Ghaziabad, Dr. Ramesh Thakur, DAVV, Indore, Dr. Dilip Kumar Sharma, GLA University, Mathura, Dr. Bhushan Trivedi, GLS University, Ahmedabad, Dr. S M Shah, KSV University, Dr. Harshal Arolkar, GLS University, Ahmedabad, Dr. Priyanka Sharma, Raksha Shakti University, Ahmedabad, Dr. Nilesh Modi, KSV, Ahmedabad, Dr. Satyen Parikh, Ganpat University, Dr. Sakshi Kaushal, UIET, Punjab University, Dr. S C Satapathy, Vishakapatnam.

In the Awards ceremony ICT Awards The EXCELLENCIA 18 Awards were conferred to Best ICT Companies, Government Departments, NGOs and Individuals.



## A report on the two days hands-on workshop on Embedded Systems Design using MSP 430 held during 13 - 14 June 2015

CSI Education Directorate jointly with National Institute of Electronics & Information Technology (NIELIT), Chennai has conducted the two days hands-on workshop on the topic Embedded Systems Design using MSP 430 during 13 - 14 June 2015 at CSI Education Directorate. Commander L R Prakash, Director, CDAC, Chennai inaugurated this workshop. Mr. Janarthanam, Scientist, NIELIT, Chennai and his team were the Resource persons. This workshop was conducted as an introduction to embedded systems design and development, using microcontrollers as core components. It developed concepts from the ground up, covering the development of embedded systems technology, architectural and organizational aspects of controllers and systems, and peripheral devices. Since microcontroller-based embedded systems tightly blend hardware and software components in a single application, the workshop also introduced the subjects of data operations and programming styles. The practical component of the workshop is tailored around the architecture of a widely used Texas Instrument's microcontroller, the MSP430. Training included solutions to selected problems and exercises.



### Key Points of workshop :

Provided coverage of embedded systems, with an emphasis on the practical use of MSP 430 microcontroller; Covered embedded software fundamentals, including software planning, and C-language program development; Included detailed treatment of embedded hardware fundamentals, discussing structure, interfacing and configuration of hardware building blocks; Emphasised examples and exercises that reflect real applications for embedded systems design.



## A report on the two days hands-on workshop on Embedded Systems Design using MSP 430 held during 24 - 25 July 2015

CSI Education Directorate jointly with National Institute of Electronics & Information Technology (NIELIT), Chennai has conducted the two days hands-on workshop on the topic Embedded Systems Design using MSP 430 during 24 - 25 July 2015 at CSI Education Directorate. Mr. V Krishnamurthy, Director, NIELIT Chennai inaugurated this workshop. Mr. Janarthanam, Scientist, NIELIT, Chennai and his team were the Resource persons. This workshop was conducted as an introduction to embedded systems design and development, using microcontrollers as core components. It developed concepts from the ground up, covering the development of embedded systems technology, architectural and organizational aspects of controllers and systems, and peripheral devices. Since microcontroller-based embedded systems tightly blend hardware and software components in a single application, the workshop also introduced the subjects of data operations and programming styles. The practical component of the workshop is tailored around the architecture of a widely used Texas Instrument's microcontroller, the MSP430. Training included solutions to selected problems and exercises.



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## Report from CSI Bhopal Chapter

The CSE Dept. of Sagar Institute of Research, Technology and Science (SIRTS), Bhopal has organized Two Weeks Short Term Training Program on "Android Application Development" from 22 June-03 July 2015. The program was technically supported by CSI Region-III and the CSI Bhopal Chapter. This hands on training program was open for the faculty Members, research scholars as well as for students. Expert Trainer Mr. Vijendra Singh Bhadouria has covered the basics of JAVA and various topics of Android such as Widgets & Computers, Event Handling, Intents, SQLITE Data base connectivity, Making Calls, Sending SMS, Ringing & Vibrating Phone, connecting App with internet during the program.



The Dept. of CSE of Sagar Institute of Research, and Technology (SIRT) , Bhopal has organized an Expert Lecture on "e-governance" under Digital India movement on 07th July 2015. Mr. Mahesh Shukla (Sr. General Manager) of BSNL delivered the talk on various aspect of e-governance. The program was technically supported by CSI Bhopal Chapter.



## Report on "Cyber Forensics" Workshop at AESICS CSI Student Branch, Ahmedabad, Region III

A workshop on "Cyber Forensics" was organized by AESICS-CSI Student Branch on 24th & 25th July, 2015, at AESICS campus. Mrs. Hiral Vegda, faculty member, School of Computer Studies, Ahmedabad University jointly with Mr. Harshal Patel & Mr. Kartik Pandit, Alumnus, School of Computer Studies conducted the workshop.

In the workshop, topics covered were Cyber security & forensics, Digital forensics, Forensics tools, Write Blocker, Creating image files, Windows forensics and Windows RAM forensics. More topics discussed were data recovery, File recovery, Photo forensics, Internet artifacts, Network and mobile forensics and E-mail forensics. The participants were given the hands on practical for different techniques to secure data and to analyze the digital information. They were given online demonstration for the concepts discussed. More than 40 students participated in the workshop and appreciated the content and hands-on-sessions.



## Regional Meet of Region - III

The Regional Meet of Region III of Computer Society of India was organised on Friday, 3rd July, 2015 at 11AM in the office premises of CSI Ahmedabad Chapter. Mr. Vijay K. Shah, Chairman-Ahmedabad Chapter, Dr. Y. C. Bhatt, Chairman-Udaipur Chapter, Dr. Darshan Choksi, Chairman-Vallabh Vidyanagar Chapter, Mr. Dipak O. Shah, Chairman-Baroda Chapter, Mr. Jayesh Solanki, Vice Chairman-Ahmedabad Chapter, Dr. Sandeep Vasant, Hon. Secretary-Ahmedabad Chapter, Prof. Jobi Jose, Hon. Secretary-Rajkot Chapter, Mr. Shripal Shah, Hon. Secretary-Surat Chapter, Mr. Amit Joshi, Hon. Secretary-Udaipur Chapter, Prof. Divyakant Meva, Hon. Treasurer-Rajkot Chapter, Dr. Viral Nagori, Hon. Treasurer- Ahmedabad Chapter, Mr. Ankit Bhavsar, MC Member-Ahmedabad Chapter, Dr. O.S. Srivastava, Imm. Past Chairman-Vallabh Vidhyanagar Chapter, Dr. D.K. Mishra, Chairman, Div. IV and Dr. Vipin Tyagi, RVP - III attended the meet.





## Report from CSI -Ahmedabad Chapter, Region III

### Inauguration of Late Prof. Shri S. R. Thakore Memorial Lecture Series

In the memory of founder chairman of CSI Ahmedabad Chapter Prof. S.R. Thakore, Fellow, CSI ; Ahmedabad Chapter is organising series of lectures during the Golden Jubilee year covering different technology and domain in collaboration with other professional societies. The objective of the lecture series is to have active participation from industry, academic and other sectors and make them aware about CSI.

The first lecture of the series "IT and business information in India 2020 - Challenges and innovations" was delivered by Dr. Paritosh Basu on 24<sup>th</sup> July, 2015. Dr. Basu is a senior professor in Narsee Monjee School of Business Management, Mumbai having rich experience of 35 years having worked as a CFO of Reliance Communication Ltd and as a Group Controller of Essar Group.



After lightening the lamp by dignitaries, Dr. Nilesh Modi informed the august gathering about the rich contribution of Prof. Thakore for CSI, Computer education and the IT Industry. Mr. Vijay Shah briefed the audience about the different programs planned by the chapter for the series. Dr. Paritosh Basu shared his knowledge about the different aspects of ICT in 2020, covering important topics like Financial controls, IT Governance and Risk Management, Cloud computing, Green ICT, Information Security, Disruptive technologies and IT Jurisprudence. Dr. Basu emphasized to be innovative, inventive and creative to achieve new milestones in ICT.

Family members of Prof. Thakore's were invited to the inauguration of the lecture series. Mrs. S.R. Thakore was facilitated by a Shawl.

The lecture was supported by IE(I) Gujarat State Centre; IETE, ACM and Gujarat Electronics and Software Industry Association (GESIA). IDEUS Technologies, Mumbai and CA Association of Ahmedabad sponsored the event. IE(I) provided the venue.

More than 200 participants including CSI members, CAs, Academicians and students attended the lecture. Dr. Sandip Vasant anchored the event and Dr. Viral Nagori, who co-ordinated the lecture, proposed the vote of thanks. The lecture was followed by dinner.

### Report on AGM of Ahmedabad Chapter - 17<sup>th</sup> July, 2015



Annual General Meeting of Computer Society of India, Ahmedabad Chapter was held on 17th July, 2015 at Ahmedabad Management Association, ATIRA, Panjrapole, Ahmedabad at 6 PM. AGM was attended by total 53 CSI members. Prof. Bipin Mehta, President, CSI-HQ graced the meeting by his presence. Dr. Nilesh K. Modi, Immd. Past Chairman gave a report on the activities accomplished during the year 2014-15. Dignitaries on the dais released "LAKSHYA", a newsletter of CSI-AC. Audit report of the society was received and adopted by the members present in AGM. Mr. Bharat Patel, NC Chair, 2014-15 announced new OB & Managing committee for the year 2015-2016/17 in front of the members present. Mr. Vijay Shah, Chairman, CSI-AC welcomed all the members and shared his plan of action for the year 2015-16. He also announced the idea of Golden Jubilee celebrations of CSI, and said that CSI-AC is organizing "Late Shri S.R.Thakore Memorial Lecture Series" throughout year which will cover various IT lectures. Dr. Sandip Vasant, Hon. Secretary, CSI-AC presented his idea about student job fair program for CSI Student Branches. CSI-AC felicitated Prof. Bipin Mehta being present as President - CSI and Prof. M. T. Savaliya, Dr. Nilesh Modi, Dr. Nisarg Pathak, Dr. Aditya Patel and Mr. Vipul Joshi for achieving various milestones. Outgoing OB and MC members were felicitated for their active involvement and service to the society. AGM was well organized by Dr. Sandip Vasant, Hon. Secretary, CSI-AC and Dr. Viral Nagori, Hon. Treasurer, CSI-AC.



# Computer Society of India™

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Form – I

Version 1.0

w.e.f. 01.06.2015

## Application Form for Institutional Membership (Academic and Non-Academic)

Complete this application form and send it along with the payment by Speed Post / Courier to CSI, Chennai (above address)

Academic (Colleges / Universities)	Non-Academic (Corporates / PSU / Govt.)

(Put ✓ in appropriate box)

School	Polytechnic	College

New	Renewal

- 1) If an existing member, proposing to renew, enter your Institutional Membership No. \_\_\_\_\_
- 2) Membership period applied for from (date) \_\_\_\_\_ to (date) \_\_\_\_\_
- 3) Name of the Institution (BLOCK LETTERS) \_\_\_\_\_  
\_\_\_\_\_
- 4) Postal Address (BLOCK LETTERS) for communication: \_\_\_\_\_  
\_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Country \_\_\_\_\_ PinCode \_\_\_\_\_
- 5) Phone with STD Code \_\_\_\_\_ E-Mail ID \_\_\_\_\_
- 6) **Details of the HEAD of the institution (Nominating Authority):**  
Name: Prof. / Dr. / Mr. / Ms. \_\_\_\_\_  
Designation \_\_\_\_\_ E-Mail ID \_\_\_\_\_ Mobile No.: \_\_\_\_\_
- 7) **Nominees' details – Faculty / Staff Members:** (Max. 03 Nominees for Academic and 04 for Non-Academic)): They will be offered free Professional Membership in CSI to be valid for the period of the Institutional membership with all the rights including voting. Please consider giving an opportunity to non-member of CSI as well, to become a part of the organisation. All the nominee members are also required to fill up their **Form No. II**, applicable for Individual membership, **for giving their other relevant details**, and send the same along with this form.

Nominee No.	Name (Prof. / Dr. / Mr. / Ms.)	Mobile No.	E-Mail ID	CSI Membership No. (to be allotted by CSI office)
01				
02				
03				
04				
05				

Note: Additional nominees can be added by adding the additional payment to be calculated as individual members.

### 8) Payment Details:

Mode of Payment			
If the payment is to be done by offline DD / Cheque, issue it in favour of "CSI Education Directorate" payable at Chennai		Name of Beneficiary as "CSI Education Directorate"	
		If the payment is to be done online by Net Banking / RTGS / NEFT / etc., then following details may be used	
Cheque / DD No.		Transaction ID	
Amount (Rs.)		Amount (Rs.)	
Date		Date	
Drawee Bank		SB A/c. No	1 0 7 9 2 4 6 3 7 4 5
Branch Name & City		Branch Name	SME Branch, Adyar, Chennai – 600 020
		Bank Name	State Bank of India (SBI)
		IFSC	S B I N 0 0 1 3 3 6 1
Please send the photocopy (or) scanned copy of the Net Banking Transaction Slip at <a href="mailto:ed@csi-india.org">ed@csi-india.org</a> ; <a href="mailto:csipromotions@csi-india.org">csipromotions@csi-india.org</a>			





# Computer Society of India™

Samruddhi Venture Park, Unit No.3, 4 Floor, MIDC,  
Andheri (E), Mumbai-400 093 Maharashtra, INDIA.  
Phone : 022-2926 1700 Fax : 022-2830 2133  
Email : [hq@csi-india.org](mailto:hq@csi-india.org) website : [www.csi-india.org](http://www.csi-india.org)

Form – II  
Version 1.0  
w.e.f. 01.06.2015

## Application Form for Individual / Life Membership

I, hereby, apply for new membership. On approval of Membership, I shall abide by the Constitution & Byelaws of the Society and the Code of Ethics. **Please also attach / upload a good quality minimum 300 x 300 pixels / passport size photograph along with a copy of Voter ID / Aadhar Card / PAN Card / Driving Licence to be used for making your CSI Membership Card.**

### I. Select the membership type

Indian ☐ International ☐

### Please tick for Membership period

One Year ☐ Two Years ☐ Three Years ☐ Four Years ☐ Life ☐

Paste your (recent) one passport size photograph here. The same will also be used for making your CSI ID Card

### II. PERSONAL INFORMATION:

Please fill in your personal information so that we can serve you better

Title of the applicant Mr. ☐ Miss ☐ Mrs. ☐ Dr. ☐ Prof. ☐

First Name

Middle Name

Last Name

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Name you would like to be printed on CSI ID card

--

Date of Birth

Gender

d	d	/	m	m	/	y	y	y	y	M		F	
---	---	---	---	---	---	---	---	---	---	---	--	---	--

Primary Email ID

Secondary Email ID

--

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Phone No. (Residence)

STD Code

--	--	--	--	--

Phone

--	--	--	--	--	--	--	--	--	--

Mobile (Mandatory for domestic membership)

--	--	--	--	--	--	--	--	--	--

### III. Mailing Address (BLOCK LETTERS):

Address line 1

Address line 2

--

--

Address line 3

Pincode

--

--	--	--	--	--	--

City

State

Country

--

--

--

(City, State and Country to be filled in only for International address)

Name of the Chapter to be attached:

--





# Computer Society of India™

Samruddhi Venture Park, Unit No.3, 4 Floor, MIDC,  
Andheri (E), Mumbai-400 093 Maharashtra, INDIA.

Phone : 022-2926 1700 Fax : 022-2830 2133

Email : [hq@csi-india.org](mailto:hq@csi-india.org) website : [www.csi-india.org](http://www.csi-india.org)

**Form – II**  
Version 1.0  
w.e.f. 01.06.2015

## IV. Payment Details:

Please specify Mode of Payment: [Online Payment / Demand Draft] \_\_\_\_\_

If payment made through Online Payment Gateway\*: Transaction ID \_\_\_\_\_

Date of Transaction \_\_\_\_\_ for Rs. .... (Rupees )

(\*Please email copy of Payment Response page along with Application Form)

If payment made through Demand Draft DD / Cheque payable at par at Mumbai should be drawn in favour of **"Computer Society of India"**.

Cheque ☐ DD ☐ Cash ☐ (Please tick as applicable)

Amount Paid Rs./\$ \_\_\_\_\_

Cheque / DD No. \_\_\_\_\_ Dated \_\_\_\_\_

Drawn on Bank Name \_\_\_\_\_ Branch Name \_\_\_\_\_

Please fill following details if it is direct deposit in Axis bank.

Date of Deposit \_\_\_\_\_

Mode of Deposit ☐ Cheque ☐ DD ☐ Cash (Please tick as applicable)

Axis Deposit branch name \_\_\_\_\_

Axis Bank SB A/c. No.: 060010100082439

Attach photocopy of Pay-in-slip with application form and write your Name, Contact no. , Membership period on the reverse of the Cheque / DD / Pay-in- Slip.

## V. Code of Ethics - Undertaking:

I affirm that as a CSI member, I shall abide by the Code of Ethics of the Computer Society of India (CSI). I further undertake that I shall uphold the fair name of the Computer Society of India by maintaining high standards of integrity and professionalism. I was not a member of CSI earlier. I am aware that my breach of the Code of Ethics may lead to disciplinary action against me under the Byelaws and rules of the CSI. I hereby confirm that I shall be bound by any decision taken by the CSI in such matters. Further, I hereby convey my consent to receive the information about the activities of the society by email or by SMS on my Mobile number, from time to time, by the society or the members of the society.

Date:     /     /

Place: \_\_\_\_\_ Signature : \_\_\_\_\_

## FOR OFFICE USE ONLY

Application received date : \_\_\_\_\_ Received By : \_\_\_\_\_

Application processed by : \_\_\_\_\_

Membership No.

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## Call for Volunteers to Strengthen the International Collaboration with IFIP, IEEE and other International Societies

**Prelude:** As the first and the largest IT professional society of India, the CSI has a crucial role to play at the national and international level. The founders of CSI had a holistic vision for the society and its members to eventually become a springboard for innovation and creativity in IT usage and development.

In the last 50 years, the CSI has made a tremendous impact in every sphere of Indian society - be it in the business, industry, government, academia, research and consultancy. The effective functioning and growth oriented organization of the CSI has made it possible to reach out to different geographical regions of India.

On the other hand, the technical divisions along with the constituent special interest groups have been providing the technological leadership to the members of the society. Since its inception, the CSI has been playing the leading roles in the international collaboration among the professional societies.

**Aim and Objectives:** To consolidate the above achievements and take forward the technology development agenda of CSI, we request our members to volunteer their services in the following ways:

1. Contribute in the activities of IFIP Technical Committees and highlight the India-specific technological needs through participation and contribution in the IFIP programmes and activities in India and abroad.
2. Contribute in the collaborative programmes of CSI and its partner societies e.g. IEEE, BCS etc. Also, participate and contribute in the continuing education programmes offered jointly by CSI and its partner societies.

**Submission of Proposals:** This call is being issued for inviting fresh proposals as well as strengthening the existing entities.

More details about IFIP, IEEE and BCS can be seen at the respective websites of these organizations.

The CSI representatives in IFIP Technical committees are especially requested to submit the activities reports and current status of the respective entities covering following points:

### CSI Representatives in IFIP Technical Committees:

- What did you set out to achieve as an IFIP TC Representative and as a global ambassador representing Indian technical community?
- What were the activities of your IFIP TC during the last year, and how you were able to contribute / participate?
- What is action plan for 2015-2017, and any constraints hat you faced/face?
- How can your involvement benefit Indian academicians, researchers and professionals? E.g. May be we could have more of our members to participate in IFIP Working Groups or other events, and/or bring more of these activities to India.

The interested members may please forward their profiles, past achievements, carrying out similar or equivalent volunteering activities and statements of intent to volunteering in IEEE, IEEECS and BCS joint programs and promotions.

**Submission Deadline:** The last date for all the submissions as above is 30th August, 2015.

**Dr. Anirban Basu**  
Vice-President, CSI

**Sanjay Mohapatra**  
Honorary Secretary, CSI

## Call for Distinguished Speakers

Computer Society of India, is preparing a list of **Fifty Distinguished Speakers** who are ready to share their knowledge and expertise with members of different chapters throughout India by delivering talks or by conducting Workshops. The list will be prepared through nomination and from applications.

The Distinguished Speaker list will be put up in CSI web site: [www.csi-india.org](http://www.csi-india.org) with contact details, areas of expertise etc. CSI Chapters/ Student Branches/ Conference organizers interested in arranging talks/workshops will contact the Speakers directly and work out the travel logistics and other terms. CSI-HQ will not play any role in this.

CSI Fellow or Life Member of CSI with 25 + years experience in academics and/or industry with in depth knowledge of a subject and interested in sharing the expertise may kindly get in touch with Mr. Sanjay Mohapatra, Hony. Secretary, Computer Society of India [secretary@csi-india.org](mailto:secretary@csi-india.org) and Prof. Dr Anirban Basu, Vice President, Computer Society of India, [vp@csi-india.org](mailto:vp@csi-india.org) / [abasu@pqrsoftware.com](mailto:abasu@pqrsoftware.com) with contact details, CSI Membership details, summary of academic credentials, highlights of professional experience, areas of expertise, interest in giving a talk or arranging a workshop, and two references.

List of Distinguished Speakers will be prepared from nominations and by selection from the list of applications received before **August 31, 2015**.



## Benefits of CSI Academic Institutional Membership and CSI Accredited Wing

Institutional Membership is a necessity for starting and maintaining CSI Accredited Wing. Additionally at least a strength of 75 Volunteers is to be maintained at all times

S. No.	<b>CSI Accredited Wing</b> (All Advantages of IM Plus...)	<b>Institutional Membership (IM)</b>
1	Eligibility for nomination of 'Best CSI Accredited Wing Award' and Academic Excellence Awards and win from a pool of 100 Awards	Recognition by Accreditation bodies for association with a Professional Organization
2	2 copies of 'CSI Communications' to the institution every month (Library/SB)	3 copies of 'CSI Communications', a source of knowledge every month
3	Log-in privilege to the Volunteers on CSI Knowledge Portal with access to distinguished Speakers list. Access of electronics copy of CSI Whizkidd and e-Newsletter	Log-in privilege to the Nominees on CSI Knowledge Portal. Access of electronics copy of CSI Whizkidd and e-Newsletter
4	Laminated ID cards in colour for student members	Laminated ID cards in colour for Nominees
5	Attachment to a State, Regional & National Student Coordinators for assistance with resource persons for various events and Professional Chapter support to organize Seminars / Workshops / Tutorials / Competitions / Expo, etc.	Grant of Free Nominee Membership to three Faculty Members with voting rights to elect the CSI leaders
6	Invitation for all Regional / State / National Student Conventions / Conferences and Competitions	Grant of 'Complimentary Membership' to Nominating Authority (Head of the Institution)
7	Concessional delegate fee for CSI Conferences and Tutorials for Volunteers	Concessional delegate fee for CSI Conferences and Tutorials for Nominee Members
8	Opportunity for Volunteers to interact with Industry Professionals and chalk out a career path. SB can invite CSI speakers volunteers for lectures / Seminars	Eligibility to publish articles in 'CSI Communications', Journal of Computing and Transactions for Nominees
9	Eligibility to publish articles in 'CSI Communications', CSI Whizkidd and CSI Journal of Computing for Volunteers	Discounted IEEE membership fee for faculty
10	Eligibility to be nominated for the Best Student paper in 'CSI Communications' and CSI Whizkidd	Reciprocal membership of BCS, ACS and subsidized product offerings by them
11	Eligibility for CSI funded Minor projects (for College Students) and Student Project Competition "CSI Discover Thinking"	Benefits available through CSI-IFIP, C-DAC, PMI & Microsoft collaboration
12	CSI Certification and Training programs at discounted rates for students	
13	Permission to conduct events under CSI Banner	
14	Participate in Online National Alan Turing Quiz Competition , National online Programming Contest and gain good exposure	
15	Opportunity to conduct Government's initiative of Electronics System Design & Manufacturing Workshops with funding from CSI	
16	One time grant (every year) from CSI for conducting a program under 'Tech-Bridge Plan' for the students & 'Tech-Bridge Program' for the benefit of common man	

For details contact : Mr. Sanjaya Mohapatra, Hony. Secy. ([secretary@csi-india.org](mailto:secretary@csi-india.org))

## From Student Branches »

(REGION - III)		(REGION -III )	
GLS INSTITUTE OF COMPUTER APPLICATION, AHMEDABAD		AESICS-CSI STUDENT BRANCH, AHMEDABAD	
			
10-7-2015 – during seminar on Emerging Trends in IT		3-7-2015 - Dr. Vipin Tyagi, RVP, Region-III & Prof. Hiral Vegda during Expert Lecture on Image Compression	
(REGION - III)		(REGION-IV)	
AESICS-CSI STUDENT BRANCH, AHMEDABAD		SILICON INSTITUTE OF TECHNOLOGY, BHUBANESWAR	
			
7-7-2015 - Dr. Dilipkumar Sharma & Dr. Sandeep Vasant during Guest lecture on Web & Information Retrieval		20-4-2015 – Prof. Patnaik felicitating Prof. Patnaik, VC, Biju Patnaik University of Tech during ICBPC-2015	
(REGION-V)		(REGION-V)	
KSIT CSI STUDENT BRANCH, BANGALORE		CMR TECHNICAL CAMPUS, HYDERABAD	
			
25-6-2015 – during APPLE in Higher education and Enhancing Digital Skills on Adobe's Best-of-Breed Creative Tools		2-7-2015 – during Guest lecture on CLOUD COMPUTING TECHNOLOGIES	
(REGION-V)		(REGION-V)	
CMR TECHNICAL CAMPUS, HYDERABAD		INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY, HINJAWADI	
			
9-7-2015 – during Guest lecture on Real Time Operating Systems & its Applications		8 & 9-7-2015 – Participants during workshop on Java Programming	



<p align="center"><b>(REGION-V)</b></p>	<p align="center"><b>(REGION-VI)</b></p>
<p>NBKR INSTITUTE OF SCIENCE AND TECHNOLOGY VIDYANAGAR</p>	<p>LATE G N SAPKAL COLLEGE OF ENGINEERING ANJANERI, NASHIK</p>
 <p>23-7-2015 – Mr. Mohan &amp; Mr. Raju L Kanchibhotla during Student Branch Inauguration &amp; Student Debate &amp; Quiz</p>	 <p>2-7-2015 – during Expert Talk on Project Development</p>
<p align="center"><b>(REGION-VI)</b></p>	<p align="center"><b>(REGION-VII)</b></p>
<p>K K WAGH INSTITUTE OF ENGINEERING EDUCATION AND RESEARCH , NASHIK</p>	<p>NATIONAL ENGINEERING COLLEGE, KOVILPATTI</p>
 <p>18 &amp; 19-6-2015 – during International Conference on Emerging Trends in Computer Engineering, Science and Information Technology</p>	 <p>9-7-2015 – Mr. Jerart Julius, SBC, NEC during seminar on Digilocker and the importance of Aadhaar system</p>
<p align="center"><b>(REGION-VII)</b></p>	<p align="center"><b>(REGION-VII)</b></p>
<p>NATIONAL ENGINEERING COLLEGE, KOVILPATTI</p>	<p>VALLIAMMAI ENGINEERING COLLEGE, KATTANKULATHUR</p>
 <p>6-7-2015 to 9-7-2015 during Short term training program on Photo-O-Magic</p>	 <p>25-4-2015 – Mr. Manian, GM, Internal Audit and Strategy, Coromendal InfoTech India Ltd during National Conference on Computer Communication and Networking</p>
<p align="center"><b>(REGION-VII)</b></p>	<p align="center"><b>(REGION-VII)</b></p>
<p>NANDHA COLLEGE OF TECHNOLOGY, ERODE</p>	<p>VALLIAMMAI ENGINEERING COLLEGE, KATTANKULATHUR</p>
 <p>10-7-2015 – during Academic Seminar IT Trends – A Business Centric Views</p>	 <p>18-5-2015 to 22-5-2015 Ms. V Sudha, Asst. Prof. Rajalakshmi Engineering College during FDP on Theory of Computation</p>

## Report on 2<sup>nd</sup> International Conference on Computer and Communication Technologies [IC3T-2015]

held during 24-26 July 2015 at CMR Technical Campus, Hyderabad in association with Div - V, Education and Research, CSI India as knowledge partner and Springer as publication partner the event. The Conference was well attended and it was a festival of feasts from the best Technical Sessions by the researchers from 10 countries.

### Day 1 : 24-07-2015 Pre Tutorial Conference with four sessions

1. Inaugural Session with Chief Guest Dr. Sri Nagesh, Head Training, Infosys STDS, Dr. Swagatam Das, Professor, Indian Statistical Institute as Guest of Honor & Mr.G.Srinath Reddy, Director COIGN. Welcome address: Dr. A Raji Reddy, Director,CMR Technical campus.
2. Followed by the inaugural ceremony a keynote session was delivered on "Latest trends in IT" by Dr Sri Nagesh Head Training, Infosys STDS Hyderabad.
3. Another keynote lecture on "Meta heuristic optimization techniques and its engineering Applications" was delivered by Dr. Swagatam Das, Indian Statistical Institute, Kolkata.
4. The day ended by a keynote lecture delivered by Mr. G Srinath reddy, Director COIGN on

"Big Data & Hadoop Eco system".

Inaugurating the Pre Tutorial Conference, Dr A. Raji Reddy, Director CMR Technical campus urged the delegates and students to continue the tradition to meet regularly and to share their expertise in different domains of Computer and communication technologies.

He mentioned, the conference provides opportunities for delegates to exchange new ideas and research findings in a face to face environment, to establish research relationships and to find global partners for future collaboration.

### Day 2 : 25-07-2015

The main event was inaugurated by Honb'le Central Minister of Labor and Employment, **Sri Bandaru Dattatreya** and **Sri Ch. Malla Reddy, MP**. Several Guests and dignitaries graced the occasion. Among them Prof **Jun Wang** from Hongkong University, Dr S C Satapathy, Chairman, Div-V ( E and R) CSI, Prof Bipin Meheta, President , CSI and Sri Aninda Bose from Springer-India were few.

Honb'le Central Minister Sri Dattatreya enlightened all the delegates and participants with his remarkable words on computer and communication technologies. He spoke about how communication is important to all of us. He also shared the initiatives taken on E-governance.

The inaugural session was also addressed by **Sri Ch. Malla Reddy** who delivered an energizing and motivating speech on Youth power, usage of technology and how it is used to make our life simpler. Followed by, **Dr. Bipin Mehta**, President CSI India, who addressed the gathering and shared his knowledge and expertise with us. He spoke about Computer society Of India and extended his support to all participants and researchers.

A key note address on "Parallel data selection based on Neurodynamic optimization in the Era of Big data" was delivered by Professor **Jun Wang** from Hongkong University.

**Dr. Suresh Chandra Satapathy** Prof. ANITS Vishakhapatnam, **Mr. Aninda Bose**, Head of Springer, India., & **Dr. J K Mandal**, Prof. Kalyani university, Kolkata addressed the gathering.

Springer proceedings were released by Hon'ble Minister and other dignitaries. The

conference received 710 papers. Out of which after a stringent review process 210 papers were shortlisted for publications in three volumes of Springer-AISC series with Volume Nos- 379,380,381.

Parallel tracks were conducted following the inaugural session and keynote lectures on the following areas:

- Computer aided diagnosis in Healthcare,
- Computer vision and image processing,
- Multi-disciplinary applications of web mining,
- Mobile and cloud computing,
- Networks, Information security and grid computing,
- Soft computing.

### Day 3: 26 - 07- 2015

Day 3 started with the parallel sessions on the following areas:

- Data mining, warehousing and Machine learning ,
- Image and video processing systems,
- Biomedical signal and speech processing,
- Optical networks, embedded systems and applications,
- Fuzzy systems in intelligent computing,
- Wireless sensor networks,
- Application of software engineering in multidisciplinary domains,

The parallel sessions were followed by the Valedictory Session of IC3T-2015.It was addressed by Sri Ch. Gopal Reddy, Chairman of CMR Technical Campus. He addressed the gathering by thanking the participants and also announced IC3T 2015 as a successful event. Dr Reddy, Director, CMR Technical Campus and Dr Srujan Raju, Organizing Chair, IC3T 2015 played significant role in making the three days event a grand success.





# CSI Calendar 2015

**Anirban Basu**

Vice President, CSI & Chairman, Conf. Committee  
Email: abasu@pqrssoftware.com



Date	Event Details & Contact Information
<b>Aug 2015 event</b>	
17-18 Aug 2015	<b>Three days hands on workshop on HTML + Javascript API for HTML 5</b> at CSI Mumbai Chapter Office <b>Contact Information :</b> Mr. Harsh Mane, <a href="mailto:harsh@csimumbai.org">harsh@csimumbai.org</a> , <a href="mailto:info@csimumbai.org">info@csimumbai.org</a> , <a href="mailto:csimumbai@vsnl.com">csimumbai@vsnl.com</a>
<b>Sept 2015 events</b>	
9-11 Sep 2015	<b>Twelfth International Conference on Wireless and Optical Communications Networks WOCN2015 Next Generation Internet</b> at M.S. Ramaiah Institute of Technology and Bangalore University, Bangalore, (in association with CSI Division IV) <b>Contact Information :</b> Dr. Srinivasa K G <a href="mailto:hod_cs@msrit.edu">hod_cs@msrit.edu</a> , Dr. Guy Omidyar <a href="mailto:omidyar@erols.com">omidyar@erols.com</a> , Dr. Durgesh Mishra
10-12 Sep 2015	<b>International Conference on Computer Communication and Control (IC42015)</b> at Medcaps Group of Institutions, Indore (in association with CSI Division IV, Indore Chapter and IEEE MP Subsection) <b>Contact Information :</b> Dr. Pramod S Nair <a href="mailto:mitm.csedepartment@yahoo.com">mitm.csedepartment@yahoo.com</a> , Prof. Pankaj Dashore <a href="mailto:pk_dashore@yahoo.co.in">pk_dashore@yahoo.co.in</a>
<b>Oct 2015 events</b>	
9-10 Oct 2015	<b>International Congress on Information and Communication Technology (ICICT-2014)</b> at Udaipur ( in association with CSI Udaipur Chapter, Div-IV, SIG-WNs, SIG- e-Agriculture and ACM Udaipur Chapter) <b>Contact Information :</b> Dr. Y C Bhatt <a href="mailto:drycbhatt@hotmail.com">drycbhatt@hotmail.com</a> , Mr. Amit Joshi <a href="mailto:amitjoshiudr@gmail.com">amitjoshiudr@gmail.com</a>
16-17 Oct 2015	<b>6th International Conference on Transforming Healthcare with IT</b> at Hotel Lalit Ashok, Bangalore Mr. Suresh Kotchatill, Conference Coordinator <a href="mailto:mail@transformhealth-it.org">mail@transformhealth-it.org</a>
<b>Dec 2015 event</b>	
26-27 Dec 2015	<b>International Conference on Communication and Network - 2015 (ComNet 2015)</b> Organized by : CSI Ahmedabad Chapter, CSI Division IV In association with : ACM Ahmedabad Chapter <a href="http://www.comnet2015.org">www.comnet2015.org</a> <b>Contact Information :</b> Dr. Bhushan Trivedi, <a href="mailto:bhtrivedi@yahoo.com">bhtrivedi@yahoo.com</a> , Dr. Nilesh Modi <a href="mailto:drnileshmodi@gmail.com">drnileshmodi@gmail.com</a>
<b>Jan 2016 event</b>	
8-9 Jan 2016	<b>Third International Conference on Information systems Design and Intelligent Applications (INDIA 2016)</b> at Anil Neerukonda Institute of Technology and Sciences (ANITS), Vishakapatnam, Andhra Pradesh in association with CSI Div-V and Proceedings Support from Springer AISC. <a href="http://www.conference.net.in/india2016">http://www.conference.net.in/india2016</a> <b>Contact Information :</b> Prof. Pritee Parwekar, ANITS <a href="mailto:pritee2000@gmail.com">pritee2000@gmail.com</a> , Prof. S C Satapathy, ANITS <a href="mailto:sureshsatapathy@ieee.org">sureshsatapathy@ieee.org</a>
<b>March 2016 event</b>	
4-5 March 2016	<b>Second International Conference on ICT for Competitive Strategies (ICICS-2016)</b> at Udaipur. (Organized by ACM Udaipur Chapter, in association with CSI Udaipur Chapter) <a href="http://www.csi-udaipur.org/ictcs-2016">www.csi-udaipur.org/ictcs-2016</a> <b>Contact Information :</b> Amit Joshi <a href="mailto:amitjoshiudr@gmail.com">amitjoshiudr@gmail.com</a>

## Guidelines of Sending CSI Activity Report

- Student Branch activity Report : send to: [sb-activities@csi-india.org](mailto:sb-activities@csi-india.org) with a copy to [adm.officer@csi-india.org](mailto:adm.officer@csi-india.org) and [director.edu@csi-india.org](mailto:director.edu@csi-india.org)  
The report should be brief within 50 words highlighting the achievements and with a photograph with a resolution higher than 300 DPI.
  - Chapter activity Report: send to: [chapter-activities@csi-india.org](mailto:chapter-activities@csi-india.org)  
The report should be within 100 words highlighting the objective and clearly discussing the benefits to CSI Members. It should be accompanied by a photograph with a resolution higher than 300 DPI.
  - Conference/ Seminar Report : should be sent by Div Chairs and RVPs to : [conferences@csi-india.org](mailto:conferences@csi-india.org)  
The report should be brief within 150 words highlighting the objective and clearly discussing the benefits to CSI Members. It should be accompanied by a photograph with a resolution higher than 300 DPI.
- Dr. Vipin Tyagi, Guest Editor ([dr.vipin.tyagi@gmail.com](mailto:dr.vipin.tyagi@gmail.com)) will be coordinating publishing of reports of these activities.



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Date of Publication: 10th of every month

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Samruddhi Venture Park, Unit No.3,  
4th floor, MIDC, Marol, Andheri (E). Mumbai-400 093



## **CSI-2015** **50<sup>th</sup> Golden Jubilee Annual Convention** on

### **Digital Life**

(02<sup>nd</sup> - 05<sup>th</sup> December, 2015)



**Hosted by: Computer Society of India (CSI), Delhi & NCR Chapters**

**Paper Submission Deadline: 17<sup>th</sup> August, 2015 [No Further Extension]**

**Paper Submission Link: <http://www.csi-2015.org/PaperSubmission.php>**

**Convention Website: <http://www.csi-2015.org/>**

#### **Announcement and Call for Papers**

**CSI-2015** invite full length original and unpublished research papers, based on theoretical or experimental contributions in the area of, primarily, Computer Science and Information Technology and, generally, all interdisciplinary streams of Engineering Sciences, for presentation and publication in the convention. **CSI-2015** will be an amalgamation of the following ten different Tracks organized parallel to each other, in addition to few theme based Special Sessions:-

**Track # 1: ICT Based Innovation**

**Track # 2: Next Generation Networks**

**Track # 3: Nature Inspired Computing**

**Track # 4: Speech and Language Processing for Human-Machine Communications**

**Track # 5: Sensors**

**Track # 6: Big Data Analytics**

**Track # 7: System and Architecture**

**Track # 8: Cyber Security**

**Track # 9: Software Engineering**

**Track # 10: 3-D Silicon Photonics & High Performance Computing**

**CSI-2015** will be held at **India International Centre (IIC), Lodhi Road, New Delhi (INDIA)**. The convention will provide a platform for technical exchanges amongst scientists, teachers, scholars, engineers and research students from all around the world and will encompass regular paper presentation sessions, invited talks, key note addresses, panel discussions and poster exhibitions.

#### **Instruction for Authors**

Authors from across different parts of the world are invited to submit their papers. Authors should upload their papers online at <http://www.csi-2015.org/PaperSubmission.php>. Unregistered authors should first create an account on <http://www.bvicam.ac.in/csi-2015/addMember.asp> to log on and upload paper. Only electronic submissions will be considered. Submissions through e-mail will not be considered.

Accepted papers shall be published by **Springer** in the form of Pre-Convention Proceedings, both, Soft Copy as well as Hard Copy and will be indexed with the world's leading indexing / abstracting / bibliographic databases.

Senior experts / researchers are also invited to submit their proposals online for organizing **Special Sessions** at <http://www.bvicam.ac.in/csi-2015/specialSessions.asp>.

#### **Important Dates**

<b>Submission of Full Length Paper</b>	<b>17<sup>th</sup> August, 2015</b>	<b>Paper Acceptance Notification</b>	<b>06<sup>th</sup> October, 2015</b>
<b>Submission of Camera Ready Copy (CRC) of the Paper</b>	<b>20<sup>th</sup> October, 2015</b>	<b>Registration Deadline</b> (for inclusion of Paper in Proceedings)	<b>26<sup>th</sup> October, 2015</b>

Detailed **Call for Paper** is available at <http://www.csi-2015.org/CallForPapers.php>. For any other query, please visit our web-portal at <http://www.csi-2015.org/home.php> or write us back at [csi2015.delhi@gmail.com](mailto:csi2015.delhi@gmail.com); [mca@bvicam.ac.in](mailto:mca@bvicam.ac.in)

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