



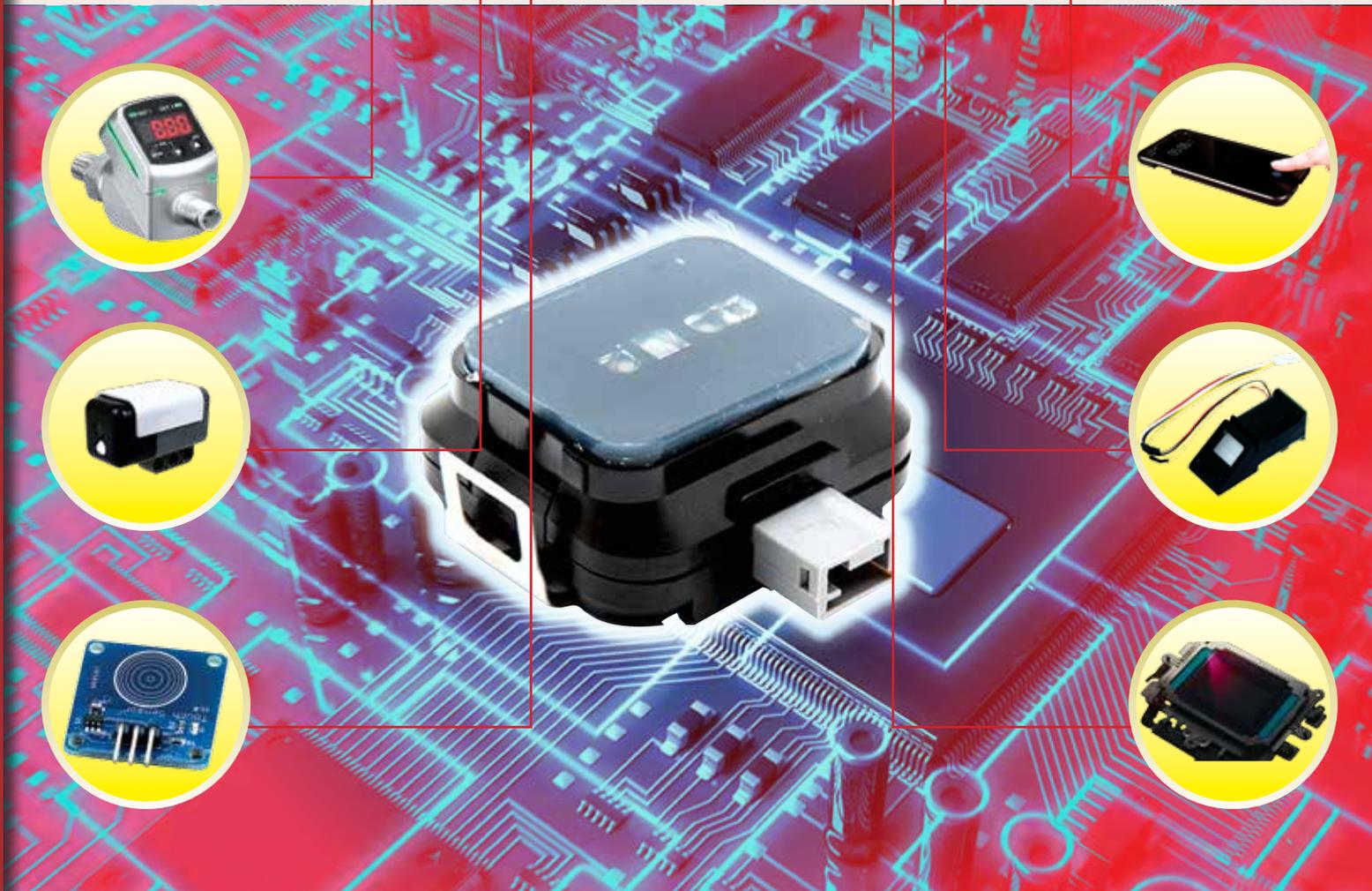
CSI Communications

Knowledge Digest for IT Community

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SENSORS *for* INTERNET of EVERYTHING



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CSI Incubation Centre Inauguration

CSI Incubation Center at CSI HQ was inaugurated by Dr. F.C. Kohli on 26th March, 2018. Dr. Kohli is a legendary figure and is considered as the father of the IT industry having founded Tata Consultancy Services (TCS). A Padma Bhushan awardee, He also has been awarded honorary degrees from Shiv Nadar University, University of Waterloo, Canada, Robert Gordon University, U.K, IIT Bombay, IIT Kanpur, Jadavpur University, Queen's University and University of Roorkee. Institute of Electrical and Electronics Engineers (IEEE) has awarded him the Centennial Gold Medal. Having been associated with CSI in multiple capacities including President, he is also a fellow of CSI

Mr. Sanjay Mohapatra, President, CSI presided over the ceremony. Dr. Gautam Mahapatra, Vice-President; Prof. A.K. Nayak, Honorary Secretary, Mr. Manas Pattnaik, Honorary Treasurer and EXECOM members participated in the ceremony. Dr. Arvind Shah, Venture capitalist and senior life member will mentor this incubation center of CSI.





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Editor: Prashant R. Nair

Editorial



Prof. (Dr.) S. S. Agrawal
Chief Editor

Dear Fellow CSI Members,

"The global industrial sector is poised to undergo a fundamental structural change akin to the industrial revolution as we usher in the IoT. Equipment is becoming more digitized and more connected, establishing networks between machines, humans, and the Internet, leading to the creation of new ecosystems that enable higher productivity, better energy efficiency, and higher profitability. While we are still in the nascent stages of adoption, we believe the IoT opportunity for Industrials could amount to \$2 trillion by 2020. The IoT has the potential to impact everything from new product opportunities, to shop floor optimization, to factory worker efficiency gains that will power top-line and bottom-line gains."

– Goldman Sachs



Prof. Prashant R. Nair
Editor

The theme for the Computer Society of India (CSI) Communications (The Knowledge Digest for IT Community) April 2018 issue is 'Sensors for Internet of Everything'

Internet of Everything (IoE) is transforming the everyday physical objects that surround us into an ecosystem of information that will enrich our lives. From refrigerators to parking spaces to houses, the IoE is bringing more and more things into the digital fold every day, which will likely make the IoE a multi-trillion dollar industry in the near future. Sensors for IoE are the building blocks for the same.

We have 2 cover stories, "Sensors for Internet of Everything" a primer given by Neelam Jha and "IoE versus IoT", a differentiation of the technologies given by Moreshwar Salpekar

We have 3 articles providing us information, overview, hardware and applications of sensors for IoE and IoT. The articles are:

- "Sensors for Internet of Everything" A. R. Revathi, Deepthi Palani Kumar and Vasanthi Palani Kumar
- "Integration of Sensor based hardware with software: A brief review" by Shaikh Gunjan, Pranab Ghosh and Pranab Kumar Das Gupta
- "Sensors for Internet of Everything" Pariza Kamboj and Nitya Komalan

We have a research front article, "Role of Sensors for Monitoring Water quality to improve public health" by G. Vijaya

This issue also contains reports of regional and state student conventions & CSI activity reports from chapters & student branches.

In our Tech Leader interview series in this issue, we have a vision for CSI given by Dr. Deepak B. Phatak, Padmashri awardee, CSI Fellow and IIT Bombay CSE professor.

We seek the support of all CSI members for suggestions and support for this next exciting section of CSI Communications.

The citations of the CSI Honorary Fellowship and Fellowship Awardees at CSI National Convention are also reproduced for inspiring all members of CSI

We are thankful to entire ExecCom for their continuous support in bringing this issue successfully.

We wish to express our sincere gratitude to the CSI publications committee, editorial board, authors and reviewers for their contributions and support to this issue.

We look forward to receive constructive feedback and suggestions from our esteemed members and readers at csic@csi-india.org.

With kind regards,

Prof. (Dr.) S. S. Agrawal
Chief Editor

Prof. Prashant R. Nair
Editor



President's Message

From : President, Computer Society of India
Date : 01 April, 2018
Email : president@csi-india.org / Cell : (91) 9861010656



CSI Incubation Centre

A great milestone for CSI in the spirit of the national mission, "Start-up India".

CSI Incubation Center at CSI HQ was inaugurated by IT industry veteran and CSI veteran, Dr. F.C. Kohli on 26th March, 2018. Having been associated with CSI in multiple capacities including President, he is also a fellow of CSI

Dr. F.C. Kohli is a legendary father figure and is considered as the father of the IT industry having founded Tata Consultancy Services (TCS). A Padma Bhushan awardee, who has awarded honorary degrees from top universities like University of Waterloo, Canada, Robert Gordon University, U.K, IIT Bombay, IIT Kanpur, Queen's University etc. IEEE has awarded him the Centennial Gold Medal. Mr. Sanjay Mohapatra, President, CSI presided over the ceremony. Dr. Gautam Mahapatra, Vice-President; Prof. A.K. Nayak, Honorary Secretary, Mr. Manas Pattnaik, Honorary Treasurer and EXECOM members participated in the ceremony. Dr. Arvind Shah, Venture capitalist and senior life member will mentor this incubation center of CSI.

This incubation center of CSI will support CSI members, both professional and students or graduates who are venturing into the start-up space. Our diverse talent of CSI fellows and senior members will also be available for guidance and mentoring of start-ups in this facility. I request for the support of all CSI members in particular all the senior members and office bearers of CSI Mumbai chapter to support his centre with your expertise, contacts and support.

Vision for CSI from Dr. Deepak B. Pathak

CSI Fellow and Lifetime Achievement awardee and Padmashri awardee, Dr. Deepak B. Pathak from IIT Bombay has articulated his vision for CSI in an interview to CSI Communications. I request all CSI office bearers at the national, chapter and student branch levels to internalize and reflect on his thoughts and ideas so as to put CSI on a steep trajectory towards sustained growth and expansion. In particular, his pointers on plan of action and expansion of CSI student branches, collaboration with NASSCOM, bridging the gap between industry and academia are welcome suggestions.

E-summit

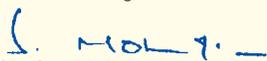
It is heartening to note that several CSI chapters and student branches are taking initiative to organize high-impact international and national events for the benefit of the CSI rank and file. In line with the national missions like "Start-up India", CSI Student Branches can emulate activities like Entrepreneurship summit organized by Shambhunath Institute, Allahabad for promoting innovation, start-up mentoring and entrepreneurship.

Student Conventions

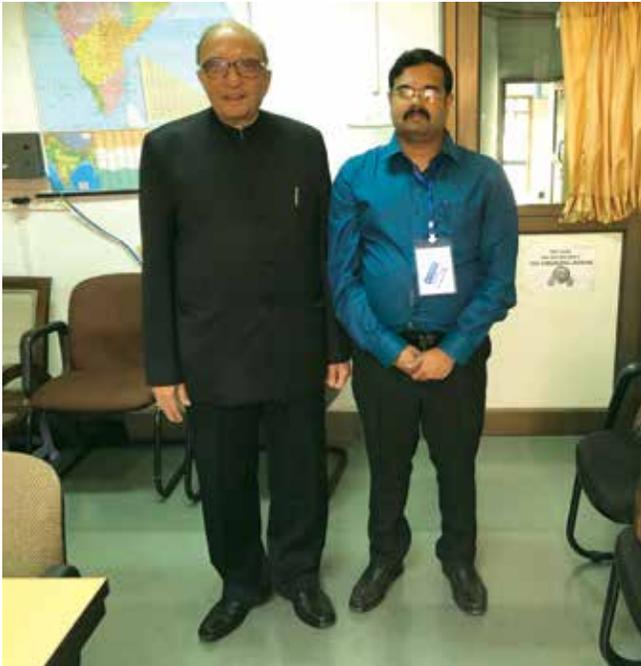
CSI Student branch activities and initiatives are picking up. We have had record number of CSI Student Conventions. In recent days, CSI National Student Convention, Regional Student Conventions in regions 1, 5, 6 and 7 and State Student Conventions at Andhra Pradesh, Gujarat and Tamil Nadu have been conducted with funding from CSI HQ and active participation from CSI student members and high quality technical contests and competitions.

Please write your valuable ideas for growth of CSI at president@csi-india.org

With kind regards


Sanjay Mohapatra
President, CSI

Tech Leader Interview: A Vision for **Computer Society of India** by **Dr. Deepak B. Pathak**



It was once said that—"Online education is like a rising tide, where it is going to lift all the boats", and here we have Padmashri awardee and IIT Bombay Professor, Dr. Deepak B Phatak, who pioneered online education in India. An alumni from IIT Bombay he is known for his notable works and was ranked as one of the 50 most powerful people in India in 2009. He is a CSI Life time achievement awardee and Fellow as well. Below is an excerpt from an interview conducted with Dr. Deepak B. Pathak by Prof. Prashant R. Nair, Editor, CSI Communications & Vice-Chairman, Department of Computer Science & Engineering, Amrita Vishwa Vidyapeetham, Coimbatore on the sidelines of the CSI Mumbai TechNext India 2018 conference at IIT Bombay.

- Q. You have given a lot of inspiration from your talks and how the teachers have to change their methods. Recently you had received a CSI Lifetime Achievement award, which is yet another feather to your cap which is adorned with the Padmashri award. Being associated with CSI, I would like to know about your thoughts?*
- A. Any recognition from CSI is special. I was really excited and grateful to receive this honor and it definitely made me happy. There has been a lot of people who have been**

doing a great deal of hard work and I was lucky to be part of the group that got opportunities to be a part of many national projects which allowed me to gain experience.

- Q. What in your opinion is the way forward for CSI? I have only heard of a time, when CSI was the voice of the entire computer science community in India.*
- A. Earlier, the entire industry, entire academia and entire government worked for CSI and took CSI seriously. In policy making, the office bearers of CSI would form important constituencies. In any CSI event, industry, government and academia would be equal participants. CSI did wonderful things for the Indian industry, particularly in the service industry but because of busy schedules of its members, they could not participate with equal gusto in multiple forums. Since their attendance dwindled, the importance attached to CSI by government dwindled and it made sense so there's nothing wrong with that. But CSI, instead reacted to this by strengthening themselves and understanding that they are primarily an academic institution. Please note that, ACM and IEEE still have large industry participation and in this, ACM has much larger participation than IEEE for IEEE is regarded as more of an academic institution than ACM. My point is, forget ACM, but why can't we be like IEEE? Why can't we enhance our own activities in enlarging the membership from amongst the various academics? Look at it this way, we have almost 1 million students on an average every year, who join Indian colleges and Universities and almost 50% of them are in the sectors of IT, Electronics and Computer Science. Why don't we have even half of those students in CSI?**
- Q. So we need to expand our CSI student branches?*
- A. We have very active CSI student branches but what do they do? Are those branches taking care of as many needs of the students? I feel the best strategy is to buttress the various student chapters. But we can't do so without giving them any incentive. Why can't CSI be the harbinger of open source software teaching for students and good faculty training? Why can't we set up lessons to teach students things required for the present trend in technology? Some lessons might be paid for and utilized whilst the rest maybe put out for open source and for anyone to use and contribute to.**

Q. Can CSI play a role in bridging academia and industry?

A. Traditionally, the interaction between industry and academia in our country is very less. In Western countries, research activities in institutions like Stanford, Berkeley, and MIT etc. – they're on par with the research done in the industry and there is constant interaction along with a give and take system with the industry. But this had never happened in India, which is pretty unfortunate and we forgot to think of the long term effects of this and we failed to take major steps that would make CSI relevant and imperative to students. We did not encourage our very own people to get into the industry and we did not give an incentive for industry to come into CSI apart from NASSCOM. I ask this one question- How many joint NASSCOM-CSI events have taken place? Perhaps, zero. If someone does not do it, they just blame it on the other and they are not bothered by it for NASSCOM has a considerable amount of financial resources and very powerful top members. As a matter of fact, these top members of NASSCOM are alumnus of various prestigious institutions across India. How many of them sit in the chairs of the academic institution of their college? They are in constant touch with academia.

Q. Any other suggestions on expanding CSI?

A. Now according to me, the only feasible way to enhance our services include long term strategy of making sure that anybody who is a CS or IT student should be a part of CSI. Second, would be to form an alumni institution and keep it active and have interaction very vigorously, like IIT Bombay's strong alumni association that contributes significantly to the growth of both the institution and the industry. One lesser known association is the Faculty Academic Network Alumni of IIT Bombay Association- this FAN comprises of all the IIT alumni who are faculty members of all the leading institutions in the world. And what does the FAN do? About 25 years ago, we realized that if we want to attract the best talent such as that of our faculty, we cannot simply advertise and expect people to come- but we must engage with people and give them an incentive to come. So what the members do is that they often report to the associations those candidates who are doing significant research projects and often support them and give them an incentive to join this association. And they in fact do. Coming back to CSI, I believe that that's a strategy we should use by giving them a reason to join and giving them the reaped benefits after joining.

Q. What about our CSI Publications and their quality?

A. With respect to CSI, there is strongly a need to improve the communication and quality of our journals, papers

etc. Many people are not willing to publish their work in our institution. I remember in Calcutta, when I was present with Dr. CR Muthu Krishnan of IIT Madras, who has also been awarded the Lifetime Achievement award, we had this conversation about why our institutions themselves don't encourage CSI publications and look towards international publications and that we should make it a point encourage more national publications.

Q. How about CSI collaborating with NASSCOM?

A. I strongly believe that we should also immediately set up communication with NASSCOM and have them collaborating with us. It seems pretty redundant to have all these academic CSI talks without at least a few powerful industry people up front in those talks and giving their input.

I realize that financially CSI is not on par with NASSCOM because NASSCOM has support from powerful industry head and when that is the case, why can't we have joint events? I think it's necessary that the leaders of CSI have a talk with the NASSCOM board and try making a collaboration work as soon as possible and showcased to the people. And when we do that, it is sure that we will get good sponsors for reasonably good funding. We can definitely get the glory of CSI back.

I remember from this Birla initiated conference I conducted in 1996 with collaboration with VLDB. We were said that any additional funds generated should be shared among CSI and VLDB. But if these funds generated were placed under the corpus of CSI control and were used instead to fund participation of Indians in research and other technological activities, it would make more sense. At that time, I created an additional of Rs. 36 lakhs and thankfully, with VLDB's support, we were able to fund for the next considerable amount of years various research and technical events. Such things can be done even now.

But the second thing that happened, which is very sad, is that lot of internal tussles started happening and it went to a point where people started washing dirty linen in public. Only if a positive image is kept in public will one ever get support. You look at a few chapters across the country, Mumbai is doing really well along with Coimbatore. We need a sort of cleaning act and that can come only with the younger generation of the organization along with the guidance of those experienced. So it is imperative that we foster good interaction with industry and conduct events regularly, and maximize the potential of it and get as much as support from the industry in giving students and faculty a learning experience as regularly as we can. With joint effort and more enthusiasm to bring a more wholesome experience we can definitely give CSI its glory back.

Honorary Fellowship Award



Shri BHVS Narayana Murthy pursued B Tech in Electronics & Communication from National Institute of Technology, Warangal and M Tech in Computer Science from JNTU Hyderabad. He is the chief architect of state-of-the-art miniaturized onboard computers for all the missile programmes in the country. He is presently Outstanding Scientist and Director, Research Centre Imarat (RCI), Avionics laboratory of Dr. APJ Abdul Kalam Missile Complex DRDO, Hyderabad.

As Director RCI, he is spearheading the development of avionics technologies in critical areas of Navigation, Embedded Computers, Control, Guidance, Telemetry, Simulation, RF and Infrared Imaging Seekers for Indian missiles and other defence programmes.

He has made significant contributions towards design, development and delivery of Onboard Computers, Missile Launch Processors, Real-Time Mission software with novel fault tolerant schemes for missions of national significance.

Under his technology leadership, India successfully designed and developed Onboard Computers and other critical mission computing systems for the ICBM class Agni 5 which have been successfully flight tested in all its four missions. The e-governance practices steered by him have received the prestigious PSU Summit Award for the year 2014 & 2015 and also the CSI e-Nihilent Award 2015.

He was bestowed with Rocket and Related Technologies Award by the Astronautical Society of India. As a team leader, he received the prestigious AGNI Award for Excellence in Self Reliance. He is also a recipient of DRDO Scientist of the Year Award, Path Breaking Research/Outstanding Technology Development Award and DRDO Performance Excellence Award. He has been inducted as Fellow of the Indian National Academy of Engineering.

Mr. Narayana Murthy brought India on to the global forefront in the advanced Real Time Embedded Computers and associated mission computing systems for the country's prestigious Defence programmes.

In grateful recognition of Shri BHVS Narayana Murthy significant contributions to the area of Computer Science and Engineering at National and International levels, the Computer Society of India is proud to name him a **HONORARY FELLOW** of the Society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention held at Kolkata on 19th January 2018.

Honorary Fellowship Award



Prof. Mike Hinchey is President of IFIP, the International Federation for Information Processing, founded by UNESCO in 1960, and Professor of Software Engineering at University of Limerick, Ireland.

Prof. Hinchey has been forefront in addressing software correctness and safety, ensuring that software development practices are at the leading edge and that best practice is used throughout the entire process. For more than 25 years, he has promulgated, advanced and promoted the use of mathematical techniques for software specification and design and its subsequent implementation and validation.

Professor Hinchey is a Fellow of IET, British Computer Society, Irish Computer Society, Engineers Ireland and Engineers Australia and a Chartered Engineer (UK and Ireland), Chartered Professional Engineer (Australia), Chartered Mathematician (UK) and Chartered IT Professional (UK).

He has contributed much to the development of educational advancements in the software arena and has been particularly supportive of students in less developed countries and encouraging of girls and women in the software industry.

In 1999, Professor Hinchey was nominated as Director of the NASA Software Engineering Laboratory by President Clinton and appointed by the United States Congress. He was subsequently re-appointed by Presidents Bush and Obama. NASA awarded him the Kerley Award as Innovator of the Year in 2009, and appointed him as a NASA Expert. He has received 26 US Patents for him innovative work in areas as diverse as automated code generation, autonomous systems and USB technology.

Professor Hinchey is Vice President of the Irish Computer Society and Chair of IEEE UK & Ireland. He is the author of more than 200 peer-reviewed articles and the author or editor of more than 20 books.

In grateful recognition of Prof Mike Hinchey significant contributions to the area of Computer Science and Engineering at National and International levels, the Computer Society of India is proud to name him a **HONORARY FELLOW** of the Society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention held at Kolkata on 19th January 2018.

Honorary Fellowship Award



Dr. Govindasamy Viswanathan is the Founder and Chancellor of Vellore Institute of Technology (VIT). He has more than 30 years of experience in the field of Educational Administration. He was born on 8 December 1938 in a remote village in the south Indian state of Tamil Nadu. He served as a Member of Parliament (1967-77) and as a Member of the Legislative Assembly of Tamil Nadu (1980-84 & 1991-96).

Dr. Viswanathan excelled in academics since his school days and obtained master's degree in Economics from Loyola College (1961), and completed Law from Madras University (1963). He completed the Advanced Management Program at Harvard Business School in 2003. In recognition of his service to India in offering world class education, he was conferred an honorary doctorate by the West Virginia University, USA (2009).

Under visionary leadership of Dr. Viswanathan, VIT has emerged as one of the best technical higher education institutions in the country offering high quality Technical Education.

Dr. Viswanathan's generous support paved the way for Computer Society of India to formation of its Chapter at Vellore in February 2005 and a student branch in April 2005. Inspired by his vision, VIT faculty members and students hosted several conferences, workshops and seminars at the regional, national and international levels to help CSI in achieving its objectives.

Dr. Viswanathan's thirst for serving the rural needs and challenges led to establishment of the Centre for Sustainable Rural Development and Research Studies (CSR&RS), inaugurated by His Excellency Dr. A.P.J. Abdul Kalam, President of India on 1st December, 2005. Other initiatives taken by him include: STARS (Support The Advancement of Rural Students), G.V. School Development Programme.

Dr. Viswanathan is the President of Education Promotion Society for India that aims to support all aspirants of education in almost every field. It is an umbrella organization of over 500 private institutions. He founded Universal Higher Education Trust (UHET) in October 2012 that caters to the needs of underprivileged students in the form of scholarship for pursuing their higher education. In Decem 2017, Dr. Viswanathan was unanimously elected as President of the Centenary Second Year Conference of the Indian Economic Association.

In a nutshell, Dr. Viswanathan through his thoughtfulness and path-breaking initiatives has left an indelible impact on higher technical education and the society at large.

In grateful recognition of Dr G. Viswanathan significant contributions to the area of Computer Science and Engineering at National and International levels, the Computer Society of India is proud to name him a **HONORARY FELLOW** of the Society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention held at Kolkata on 19th January 2018.

Fellowship Award



Ms. Alakananda Rao has worked in the Information Technology profession for over 30 years with India's leading IT firms- Tata Consultancy Services (TCS), the National Center of Software Technology (currently the Center for Development of Advanced Computing, or C-DAC), NIIT and NITEL, Bhopal in developing and implementing large software projects for Government of MP and others.

Ms. Rao a certified PMP and holds a post-graduate degree from the Indian Institute of Technology (IIT), Kharagpur, and a diploma in Management and undergone training in Project management at Institute of Systems Science under NUS, Singapore. She has presented number of papers at Conferences at Oxford, at Bangkok and at San Francisco .

She has pioneered the process of change in IT functioning at Hindustan Paper Corporation encompassing multi-location software development and deployment for country-wide projects in IT. At ActionAid International she has headed the global operations of IT with focus on Asia and the Latin America and Caribbean Region and managed global projects that bring IT applications to philanthropic development programmes in Vietnam, Nepal, Bangladesh, Brazil, Guatemala, and trained staff and partners in the use of technology. She has run programmes in rural computer skills development through multi-location training in various Computer Literacy across rural India.

She is a member of Computer Society of India (CSI) since 1986 and actively associated with the CSI - Kolkata Chapter and has been on the Management Committee, and the Chairperson for 2007-08.

In grateful recognition of Ms. Alakananda Rao's services to Computer Society of India, and her outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name her **FELLOW** of the society. The Society is pleased to present her with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.

Honorary Fellowship Award



Mr. Vivek Sawant is the Managing Director of Maharashtra Knowledge Corporation Limited (MKCL) since its inception in 2001. Under his leadership, MKCL has emerged as a high-tech initiative of the Government of Maharashtra and 10 universities in Maharashtra for development and delivery of Education, Governance and Empowerment technologies, solutions and services to masses.

In MKCL, he has successfully integrated a network of about 5500 Authorized Learning Centers spanning over the Maharashtra state. About 25,000 trainers, counselors and facilitators serve in this network at their own native places. This network is the single largest private-public-partnership network of its kind in India. In last 15 years, under the leadership of Mr. Sawant, about 11 million students have taken low-cost, high-quality IT Literacy education leading to MS-CIT certification through this network. This is a world record. Apart from

MS-CIT, various Digital Empowerment services are offered to more than 20 million common people in Maharashtra and other states of India and over 110 other countries such as BS-CIT for Bihar, HS-CIT for Haryana, OS-CIT for Odisha, KLIC IT for rest of India, and MI-CIT, ERA, KLIC, OASIS, eSchool, SuperCampus and Digital University for international learners under his leadership.

After his schooling in Nasik and Post-Graduate studies in Pune, Mr. Sawant served as a lecturer in Physics, Electronics and Computer Science at the Fergusson College, Pune from 1979 to 1987 and as the Deputy Director of Symbiosis Institute of Computer Studies and Research from 1987 to 1988. He also volunteered as an activist in People Science Movement for propagation of science and scientific temper among the common people and for creating awareness among people on the burning issues at the interface of science and society.

His research in developing high-performance computing platform for solving large and complex systems of equations in condensed matter physics, invited him to participate as a pioneer in design and development of India's first indigenous Supercomputers PARAM at the very inception of C-DAC in 1988. At C-DAC, he also developed the nationwide network of Advanced Computing Training Schools (ACTS). Under his leadership, more than 25,000 engineering graduates were rigorously trained in software engineering and state-of-the-art software development tools and methodologies.

Mr. Sawant has served on several policy-formulation committees at state and national level including the Indian Prime Minister's IT Task Force, State eGovernance Task Forces, Pradhan Mantri Gram Sadak Yojana, etc. He has served on Boards of Studies and Academic Councils of several universities. He is an honorary fellow of Maharashtra Academy of Sciences.

He serves as founder director on the boards of several organizations such as MKCL, OKCL, HKCL, MKCL International Free Zone Establishment, Dubai, MKCL Arabia Ltd, Riyadh (and its branch viz. MKCL Egypt, Cairo), MKCL Lanka, MKCL Knowledge Foundation, etc. He also served on the Board of Rajasthan Knowledge Corporation Limited (RKCL). Mr. Sawant has authored many research papers and articles and delivered lectures in India and abroad. Mr. Sawant is the recipient of several prestigious awards.

In recognition of his outstanding accomplishments and memorable services to the Computer Society of India and academia, CSI is pleased to confer upon Mr. Vivek Sawant the **HONARARY FELLOW** of the society. The Computer Society of India takes pride and pleasure in presenting this citation to Mr. Vivek Sawant on the occasion of its 52nd Annual Convention held at Kolkata on 19th January 2018.

Fellowship Award



Dr. S Subramanian is the former Vice Chancellor of Karpagam Academy of Higher Education (Deemed University), Coimbatore, Tamil Nadu. He served as Professor of Computer Science and Engineering at I.I.T., Kharagpur 1993. Thereafter he served as Principal of Kumaraguru College of Technology, Coimbatore, served as founder Principal of Sri Krishna College of Engineering and Technology, Coimbatore. Under his leadership both institutions earned reputation as a leading engineering institution in Tamil Nadu.

He has published around 50 papers in international and national journals and has guided 10 PhD research scholars. He has served as Chairman / member of Board of studies in Universities and Autonomous Colleges. He was also member Academic Council of Anna University. He has widely travelled to Russia, Singapore, Nigeria, Malaysia, Germany and USA on academic and professional assignments.

He has served CSI at various levels being, Member of ExecCom of CSI for two terms. He was Chairman of CSI Coimbatore Chapter. He has been instrumental in conducting a number of conferences under Coimbatore Chapter. He was the Chairman, Program Committee of CSI annual convention 2016 held at Coimbatore. As a Computer Science Professional he has contributed to the spread of CSE education in several institutions.

In grateful recognition of Dr Subramanian's services to Computer Society of India, and his outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name him **FELLOW** of the society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.



Fellowship Award



Dr. Phalguni Mukherjee, is Director of Institute of Chandernagor, under Department of Higher Education, Science & Technology and Biotechnology, Government of West Bengal and Visiting Professor of JIS University, Kolkata. Prior to that, he was a faculty member of Mathematics in Asutosh College, Kolkata and a member of the Governing Body of that college, when he took initiative to introduce Computer Science course in the college. He has been carrying out different academic responsibilities at different levels for more than 38 years and working for spreading of Computer Science education among different sections of the society.

Dr Mukherjee's areas of interests are Graph Theory, Mathematical Modelling of Environmental/Biological Sciences. The number of his publications is more than 40, including books, papers and articles. He also writes popular articles on non-technical interesting issues for common people. For his tangible and significant contribution in promoting Science & Technology education among masses, the Science Association of Bengal conferred "Lady Abala Basu 150th Birth Anniversary Memorial Award".

Dr Phalguni Mukherjee, is a Patron and past Chairman of CSI Kolkata Chapter, held many key positions at the Chapter, Regional and National levels In CSI. He also held the positions of Regional Student Coordinator of CSI and Chairs/ Co-Chairs/ conveners/ Judge of different programs organized by CSI and many other organisations. He is the Chairman of the Organising Committee of the 52nd Annual Convention of CSI.

In grateful recognition of Dr Phalguni Mukherjee's services to Computer Society of India, and his outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name him **FELLOW** of the society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.

Fellowship Award



Prof. Bharat Bhasker is currently Director of Indian Institute of Management (IIM), Raipur. Prof Bharat Bhasker has earned Master's and Ph D from Virginia Tech, USA and has B E from IIT Roorkee. Earlier He served a Professor of Information Systems for 20 years at IIM Lucknow, where he pioneered and founded the Internet Commerce Research Center in 1999. Prof Bhasker has served as Visiting Professor at University of California, Riverside, University of Maryland, USA, University of Texas, Dallas, USA, ESSEC Business School in France. On invitation of Govt of South Korea, he spent one semester at Chung-Ang University as Distinguished Professor.

He has published more than 100 papers and two books in the area of Electronic Commerce. He is also in the Editorial Board and reviewer of several International Management Journals, and has served as Editor of Metamorphosis, Journal of Management Research published by IIM Lucknow for 4 years. He was honored with Asia B-Schools Best Professor of Information Technology 2010 by CMO Council Asia, Singapore and Wall Street Journal.

Prior to joining IIM Lucknow, Prof Bharat Bhasker had been associated with leading research projects at Goddard Space Flight Center, NASA in designing and managing solution to the processing, archival and distribution of data beamed down from various space missions. The task required interfacing with various US agencies and coordinating the funded research with several universities. For research contributions, he was honored with the Research Productivity Award of NASA.

Further he worked in several high technology Silicon Valley companies where he managed the following software products: ISIS and Sybase MPP. The ISIS product assists drug discovery by integrating the chemical databases and chemistry on a single package. The Sybase MPP was a parallel DBMS designed to scale up to 1024 processors.

Prof Bharat Bhasker has been active senior member of CSI for two decades, and has contributed by organizing several National and Regional conferences. Prof Bharat Bhasker also served as Vice Chairman of Lucknow Chapter 2011-12, and as Chairman 2012-2014.

In grateful recognition of Prof Bharat Bhasker's services to Computer Society of India, and his outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name him **FELLOW** of the society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.

Fellowship Award



Mr. Bharat Patel is an Electronics and Communication Engineering from Gujarat University, pursued research at Bhabha Atomic Research Centre, Trombay and Operational Research Group, (ORG), Baroda and Space Application Centre, ISRO for designing of microcomputers and Integrated Circuits. He has more than 3 decades of experience and recognized as a goal-orientated, energetic and highly skilled information technology leader and effective presenter with great interpersonal skills with combination of both technology and business, has experience in collaborating for growth of the international business. He has been recognized as ambassador of change, a keen strategist with expertise in providing effective business solutions.

Mr. Patel shares a strong connect and involvement with trade Associations, consulting organizations and academic institutions with a clear motive of bridging and connecting all the stake holders for technology development, through Research, and Innovation, and building Incubation Centers by fostering startups.

He is a Fellow of IE(I) and IETE, Association of British Scholars (a Division of British Council), British Business Group, GCCI, GESIA IT Association, founder member with Gujarat Innovation Society (GIS), ASSOCHAM and many more. He was the Chairman of CSI, Ahmedabad Chapter 2010-11, and has organized various events under CSI.

In grateful recognition of Mr. Bharat Patel's services to Computer Society of India, and his outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name him **FELLOW** of the society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.

Fellowship Award



Mr. K Jayaramakrishnan is an IT veteran with over 35 years of experience in the Industry. Having retired as Vice President- Global Alliances of Tata Consultancy Services, he continues a role as a consultant having served the company for 28 years both in India and abroad. He managed several key accounts during his tenure in the USA including American Express, Time Warner, NASDAQ and Target. He returned to India and served as Vice President - India Business Unit for seven years covering Indian Financial Institutions, Corporates and Government customers.

JRK, as he is popularly known in the industry, has served as the Chairman - Convener of the Confederation of Indian Industries (CII) Task Force on Industry-Institute interaction between 2004 and 2009. He served as the Convener for the ICT Academy of Tamil Nadu, a consortium of the Government of India, the Government of Tamil Nadu and the CII.

Currently, he is the member of the Proposal Approval Committee (PAC) of National Skill Development Corporation (NSDC), an initiative by the Government of India. His stints as an Advisor in a number of educational institutions in South India has helped him leverage his vast industry experience to aid developing a roadmap to address skills that the Industry demands today, and forecasts for the future. He is in the Board of the Rajalakshmi Group of Institutions, Chennai.

JRK was a member of the IT Task Force of the Government of Gujarat and e-Governance Standards Committee of the Government of Tamil Nadu. He also served as the Chairman of the Computer Society of India, Chennai Chapter in 2008.

JRK holds a Post Graduate Management degree from Jamnalal Bajaj Institute of Management Studies, Mumbai having specialized in Systems and Marketing. In his free time, JRK enjoys playing golf and listening to Carnatic Music.

In grateful recognition of Mr K Jayaramakrishnan's services to Computer Society of India, and his outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name him **FELLOW** of the society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.

Fellowship Award



Mr. Thangavel Mani, an academician turned IT entrepreneur, is the Founder, CEO & Managing Director of Kalpatharu Software Limited, the first Software Development company established at Coimbatore in 1988, a ERP solution provider for Textile Industry.

Mr Mani was instrumental in successful Implementation of e-Governance project at Coimbatore Municipal Corporation, project awarded by National Informatics Centre (NIC), in the year 1998 and got Prime Minister's recognition among Tier II cities. With his brilliant programming skills & domain expertise gained in Software development projects for over 15 years, has developed a cost-effective vertical ERP product for Textile Industries and launched in 2004 for pan India. The same was marketed by M/s Voltas Limited - Textile Machinery Division, His team had also developed Country specific ERP for Spinning Mills for South East Asian market launched in 2010. He & his team had developed a concise & comprehensive Management Information System to monitor effective & profitable operations of Textile Mills, which is widely popular.

Mr Mani is one of the Founder Members of the CSI, Coimbatore Chapter which was established in 1984. Has served actively at various positions as MC Member, Secretary during 1985-86 and Chairman during 1998-2000. He has been recognized with Chapter Patron award in 2004. Has organized many events at the Chapter, State, Regional and National levels and was the Registration Committee Chairman for CSI-2016. He is also Member of Board of Studies, and Academic Councils of various leading educational institutions.

In grateful recognition of Mr. Mani's services to Computer Society of India, and his outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name him **FELLOW** of the society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.

Fellowship Award



Mr. Chandrashekhhar Sahasrabudhe has been a senior Computer Professional who has been serving the profession since last 35 years. He has been a witness to the dramatic changes, which the profession has gone through this period and has adapted to them with rare commitment and application.

Mr. Sahasrabudhe joined Computer Society of India in 1978. His competence and dedication as a member earned him the position of the Chairman of Pune Chapter in the year 1988. His contribution to Pune Chapter however stretched beyond his tenure and he was instrumental in organizing many educational programs for the chapter and played a major role in all the activities. He served as Regional Vice President for Region VI from 2010 to 2014 and in this capacity he was able to revive many chapters from the brink. He successfully organized CSI YITP and IT awards in 2015.

Organizing conferences has been a special skill which Mr. Sahasrabudhe has cultivated to the advantage of the society. Over the years he has played an important role in various conferences at local and national level including COMAD 1995, COMAD 2000, CONSEG 2013 and CSI 2009 – Annual convention of the society. He was General Chair for COMAD 2012.

Mr. Sahasrabudhe has a special interest in education and has contributed to several education-related activities of CSI. He has helped CSI and Education Directorate to organize national level activities like programming and project competitions. He is a visiting faculty at many engineering and management colleges in Pune. He has helped these colleges in organizing many activities for students and faculties in order to bridge industry-academics gap. He has conducted several industry-academia interactions and in conjunction with the Board of Studies has conducted several teacher-training workshops. He currently serves on Board of Studies of two autonomous Engineering colleges and has been on several committees of Pune University.

Mr. Sahasrabudhe has led several initiatives for Women in Computing and has helped women come back to work after a break. He played an important role in the Anita Borg Institute's yearly conference - Grace Hopper Celebrations India for several years.

In grateful recognition of Mr. Chandrashekhhar Sahasrabudhe's services to Computer Society of India, and his outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name him **FELLOW** of the society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.

Fellowship Award



Ms. Sudha Raju has been a source of inspiration with her unquestionable integrity, exemplary values, energy, enthusiasm and her result orientation. Being a "charming person", a title bestowed on her by the education minister, doors open for her easily. Her wide network has ensured that we get sponsorship and great speakers from the industry, academia and Government.

As a Chairperson, she was instrumental in turning around the Bangalore Chapter financially. In her tenure, she conducted more than 72 programs, beating all records of the chapter. She is an excellent communicator. This combined with her expertise, drive, and passion, helped change the brand image of CSI Bangalore Chapter. She has been the champion of various programs, sometimes with topics way ahead of the industry. She has been closely involved, right from 1996, in the annual conventions. It is because of her expertise and reputation for commitment that she was asked to lead the CSI 2006, which she accepted immediately.

As RVP, being a visionary, she set clear vision, goals and objectives for the region. She created Balanced score cards for the Chapters thereby bringing in a corporate culture. With her experience in Leadership development, she helped the chapters govern their chapters well. She monitored and reviewed the activities of the chapters making the region vibrant. She has played a vital role in shaping IT talent at local, regional and national levels having worked with organisations like IIM-B, NIIT, NIS and Manipal Universal. She has worked closely with Karnataka, Kerala, Tamil Nadu & Goa to develop their IT policy. Her contribution to IT Education and Training is immeasurable. Mainly responsible for NIIT bagging an order for 150 crores for training Govt school children, millions of school students across 7 states, college students, IT Professionals and CEOs have benefitted directly or indirectly from her innovative thoughts and exemplary execution. She conceptualized, proposed and did the ground work for setting up IIIT-B, IT.com and Yuva.com for Karnataka Government. She has worked closely with GOK on various committees. She has given talks at various colleges, industry meets and Govt functions with raving feedback.

She has been the Chairperson of MAIT Southern region. She was the head of IT and BPO panel of CII. She set up the first Women's Business Leaders' forum in CII, which earned kudos not just for earning good surplus but also for the activities. She was part of the CII national education council. Being an invited member of BMA, she conducted various programs. She has trained several leaders & advised many companies at strategic level.

She continues to contribute to CSI and has organized "IT in Defence", the flagship event of CSI-BC and has helped conduct MSME seminar too.

In grateful recognition of Ms Sudha Raju's services to Computer Society of India, and her outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name her **FELLOW** of the society. The Society is pleased to present her with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.

Fellowship Award



Prof. Dharm Singh Jat received his degree Master of Engineering and PhD in Computer Science and Engineering from prestigious universities in India. He is a Professor (Director) of Namibia's University of Science and Technology (NUST). From 1990 to 2014, he was with College of Technology and Engineering, MPUAT, Udaipur, India. He has guided about 8 Ph D research scholars and author of 4 Books and an editor of 16 books including Springer edited books and IEEE conference proceedings and has authored and co-authored over 140 research publications in peer-reviewed reputed journals, book chapters and conference proceedings.

His interests span the areas of multimedia communications, wireless technologies, mobile communication systems, roof computing and video transmission over wired-wireless networks, Software Defined Networks, Network security, Internet of things and ICTs Applications. He has given several Guest Lecturer/Invited talk at various prestigious conferences.

He has been the recipient of more than 19 prestigious awards, such as Eminent Scientist Award, Distinguished Academic Achievement, Eminent Engineering Personality, CSI Chapter Patron, CSI Significant Contribution, Best Faculty Researcher 2017 (NUST), Best Technical Staff, Outstanding Services, IEI Fellow, Senior Member IEEE and Distinguished ACM Speaker. Formed Special Interest Group on Wireless Networks of Computer Society of India and designated first Convener and Chairman, SIG-WNs by CSI. He was Member of International review committee for accreditation and chairing of a number of programs of International Conferences.

In grateful recognition of Prof Dharm Singh Jat's services to Computer Society of India, and his outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name him **FELLOW** of the society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.



Fellowship Award



Dr. Rabinarayan Satpathy is the Executive Director of Trident Group of Institutions, Bhubaneswar, Odisha, which is the leading educational group of the state engaged in Engineering, Biotechnology, Computer Application & Management Education.

Dr. Satpathy Prost graduated in Computer Science & Engineering, Applied Mathematics & PGDBA from NIT, Rourkela and Symbiosys respectively. He also completed Pre-Doctoral Program in Computational Mathematics, Computer Science & Bioinformatics. Dr. Satpathy completed his two PhD- one is from Utkal University & another is from Fakirmohan University. To his credit, he has completed Doctor of Science(DSc) from Fakirmohan University & Post Doctoral from NIT, Rourkela. So far international recognition is concerned , Dr. Satpathy got PhD from Cosmopolitan University, USA, Grand PhD from WCU & DSc. from IU.

He has 24 years of experience in the field of academics & administration and research. Out of which 11 years as Principal/ Director in Degree Engineering Colleges, 4 yrs as Dean & 10 yrs research.

He has published three books, 158 papers in journal & 74 papers in proceedings. He has received 09 international awards & 35 national/regional awards. Under his guidance, PhD awarded to 05 persons, MTech/MPhil awarded to 24 persons and 144 student completed B.Tech projects.

He is a Fellow Chartered Educator of CCLP Worldwide (An International Organization having special consultative status with UN ECOSOC, Institutional Membership of UNESCO NEQMAP and UN Academic Impact) and Fellow Member ISRD (International Society of Research & Development), IETE (Institution of Electronics & Telecommunication Engineers , ISLE, (Indian Society of Lighting Engineers) & SESI (Solar Energy Society of India).

He was the academy council member of BPUT, NoU & SCTE& VT, Odisha. He is a reviewer of IEEE journals & many other international/national journals. He is responsible to reestablish the CSI activities after a long gap in Odisha in the year 2013. He has acted as RSC two times & Honorary Secretary of CSI, Bhubaneswar chapter. During his period, he has established CSI in a large way in Odisha.

In grateful recognition of Dr Rabinarayan Satpathy's services to Computer Society of India, and his outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name him **FELLOW** of the society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.

Fellowship Award



Prof. B G Sangameswara, is the Vice Chancellor of JSS Science and Technology University, Mysuru. He has three decades of rich experience in establishment of Technical and Engineering Educational Institutions and Industries in India and abroad. He is a PhD in Computer Science and was Principal of SJCE, Mysore, a premier engineering College in India from 2003 to 2013 after serving as a faculty in the same institution for about two decades.

Prof Sangameswara is a pioneer in Computer and Technical education system in India, for establishment, rejuvenating and introducing technical standards and monitoring system in technical education in Engineering, Pharmacy, Architecture, Hotel Management and Catering Technology, Management and Computer Applications across the country.

His trust with computer engineering skill and rich knowledge empowered and selected as the Advisor- at All India Council for Technical Education. During his tenure he was responsible for efficiently dealt with 4000 Technical, Management and Information Technology Institutes in the Country. Further he successfully coordinated with Ministry of Human Resources Development, Parliamentary Standing committee, and various statutory bodies of India in Planning Policies, implementation of various Technical Educational standards thus taking Computer Science and Technology to increase the bar to new heights in India.

He has been a driving force in overseeing the conclave of Technical Education institutions, Science and technology Entrepreneurs Park (STEP) and Engineering colleges at overseas and in India. He is involved in establishing active partnership between Industries and technical education system contributing skill and technical professional manpower development in India. He was responsible for establishing Research Center & Incubation center at SJCE in collaboration with reputed organisations like Bosch, Texas Instruments, Rexroth etc.

He is Founder of CSI Mysuru Chapter and served as Chairman of the Chapter during 94-95 and has delivered lectures at various CSI forums.

In grateful recognition of Prof B G Sangameswara's services to Computer Society of India, and his outstanding accomplishment as an IT Professional, the CSI Awards Committee decided to name him **FELLOW** of the society. The Society is pleased to present him with this citation on the occasion of its 52nd Annual Convention at Kolkata on this nineteenth day of January 2018.

Sensors for Internet of Everything

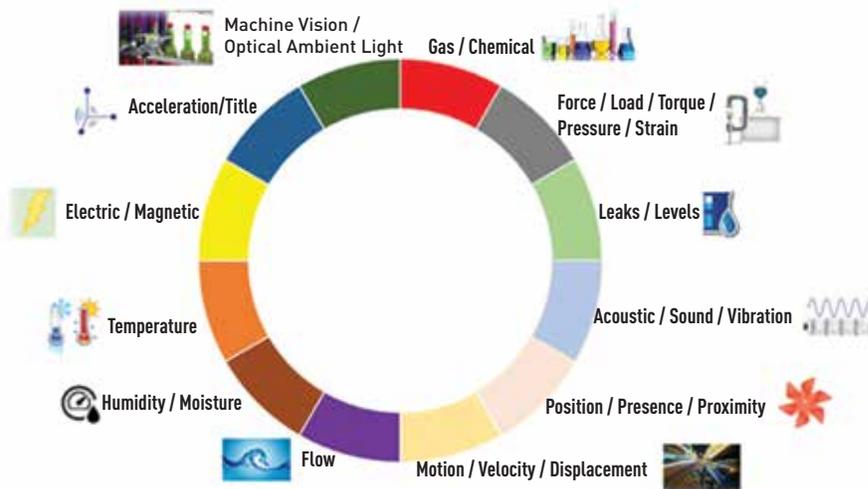
Neelam Jha

Faculty, Officers Training College, Central Bank of India

Introduction

A few decades ago we saw in Hollywood flicks how the heroes could command jobs at one location, sitting far away at another spot. This so called fictional environment or the flight of fancy of the movie directors is now REAL. Welcome to the world of Internet of Everything (IOET) wherein physical devices can communicate with each other and/or can be controlled remotely. The phrase "Internet of Things" was first coined by Kevin Ashton in 1999 who famously said, "the Internet of Things has the potential to change the world, just as the Internet did – maybe even more so." Few years later his prophecy seems absolutely true with further additions. Now the world is abuzz with Internet of Everything. It is basically the networked interconnection of machines through identifiers such as sensors, actuators, radio-frequency-identification tags, and Internet Protocol addresses. Technology is moving at a fast pace. Disruptive technologies are moving even faster. Internet of Everything has the tremendous capability to transform our lives and the way we lead it.

The technology may be termed futuristic by few people but the swift advancements being made in this field is clearly visible to all. The universal embracement of the Internet of Everything may take time, but the time line is advancing rapidly due to improvements in underlying technologies. Massive progress in wireless networking technology and the greater standardization of communications protocols have made it possible to collect data from these sensors 24 X 7 from any point on globe. Silicon chips are enhancing their capabilities. Further gargantum increases in storage and computing power have made number crunching possible at comparatively larger scales coupled with declining costs.



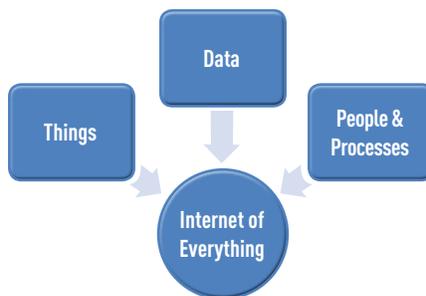
Internet of Everything: How it works:

People: It connects people more efficiently.

Process: It delivers the accurate information to the concerned person at an appropriate time.

Things: Physical objects are interconnected within as well as to the internet.

Data: It converts massive data to useful information in very short time.

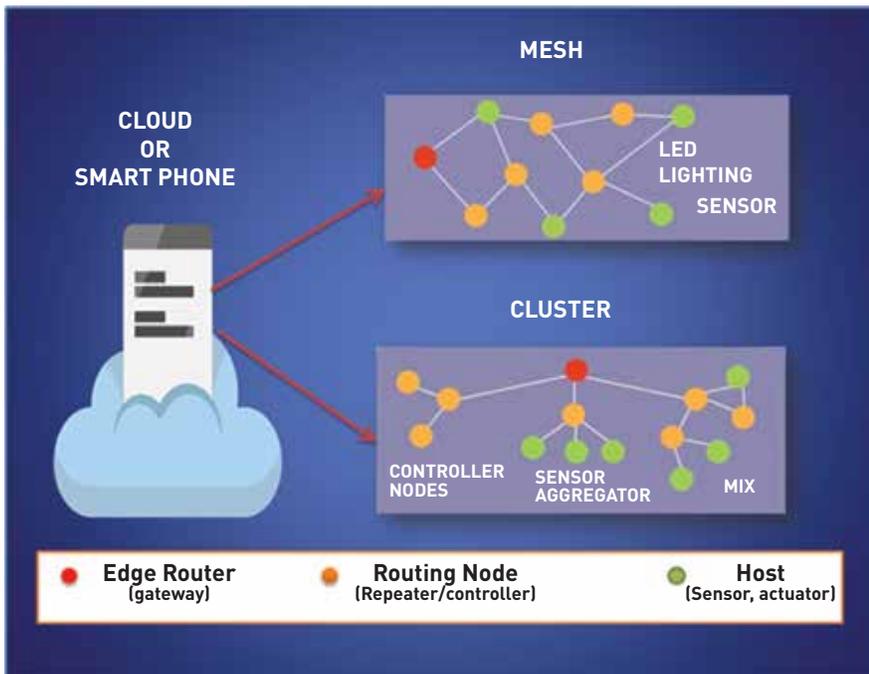


IOET can be referred to as an intelligent connection of sensors, data, connectivity, things, people, and process so as to make the world a smarter and better place to live. With the use of billions of sensors and networks it can create enhanced experiences and extraordinary economic opportunities at individual as well as national levels.

IOET expands the horizon of the

"Internet of Things" so as to connect not just physical devices but quite literally everything by getting them all on the network. It astutely moves beyond being a craze fad and technology mantra and offers higher computing power and better solutions. This connection goes beyond elementary M2M interactions, and leads to further automation and advanced "smart" applications. It has the potential to connect more devices by extending the edges of the network. It undeniably has a major role in all functionalities of human life from womb to tomb.

IOET is based on the premise that Internet connections will not be restricted only to laptop or desktop or a handful of tablets. In 21st century machines will become smarter with increased access to data and expanded networking opportunities. In coming years, focus will be on millions of devices interacting with one another with minimal human intervention, so as to make businesses and processes more efficient, effective and transparent. Some of the technologies of the **IOET** are still evolving, but the connectivity in the world is happening very fast, and hence it has immense propensity to create an impact on a global scale.



To understand it in a simpler way, today mobile phone can be connected to the home automation system so that as we approach our homes, our mobiles can send signal to it triggering a chain of responses like.

1. Main door will open on arrival.
2. Lights will be automatically turned on.
3. Thermostat AC will adjust room temperature.
4. Bath tub will be ready.
5. Tea maker will be ready with a hot cuppa tea.
6. Depending on mood the music will be automatically set.

Example of IOET node within a building including Edge Routers

In the above picture we can see the usage of sensors, edge routers, and routing node in a smart building engaging the cloud technology as facilitator and mobile phone as remote.

The role of Sensors:

These are just few examples in the automated world that we can enjoy in our daily lives. And as we can see IOET is not one but combination of various devices. There is a plethora of sensors that go into IOET devices. Just as humans have sensory organs, today's digital world needs sensors for efficiency, accuracy

and safety. These Smart sensors are vital enablers of IOET. They serve the following objectives:

- The sensor identifies and locates items in the supply chain.
- Their importance in plants and warehouses is immense as they can validate temperature and humidity as per the Standard Operating Procedures.
- Sensors can exist within products to generate "smart products" with augmented features.
- They can also perfuse into the manufacturing process to monitor and control the operations.
- The combination of lowered costs and improved capabilities implies that there is a colossal opportunity for organizations.
- They can be used as triggers in the system to avert mishaps.
- Sensors can monitor body temperature and pressure levels of users and/or patients. Hence it can be used in preventive health care as well as treatment of patients.

When we are discussing machine-to-machine communication, it implies the usage of sensors also. While exploring smart machines, one cannot exclude sensors as they are keys to developing IOET applications for

manufacturing. They also contribute in renovating and overhauling of analytics. Sensors help in evaluation and gathering of data. But it needs infrastructure to analyze this data in real time. The Internet of Everything needs cloud-based applications to interpret and transmit the data coming from all these sensors. The cloud is what enables the apps to go to work for us anytime, anywhere. However to reduce processing time the new Edge computing technology is also being used. It is an analytics approach that analyzes data close to its source instead of sending it to a remote server for analysis. Such edge analytics will allow organizations to act on new insights within milliseconds. So there can be a real world wherein sensors can monitor and track all sorts of data and further edge/cloud computing would translate that data into proficient intelligence and transmit it to machines on the ground, thus providing mobile, real-time responses.

Commonly used sensors in IOET

The variety in type of sensors available in the market is mind boggling. They are being used in almost all aspects of human life. Let's look at some of the sensors and their applicability:

1) Temperature sensors:

They can measure the temperature or heat of a given medium. Few of its common usages are in simple thermostat devices to highly sensitive semiconductors.

2) Proximity sensors:

Proximity sensors generally utilize electromagnetic radiation to detect motion or habitation. These sensors can be used in variety of applications viz navigation(to a crowded place or any complex route),security operations, home applications,parking systems, museums, airports, and many more. Further they can also be used by retailers to connect with the customers once they are in the vicinity of their shops by sending them some offers on their mobile phones.

3) Pressure sensors:

They are used in various areas such as touch screen devices, bio medical instrumentation, automotive

and manufacturing industry to name a few. For example barometers (used in weather forecasting) and pressure gauges (used at industrial sites as it effectively monitors the pressure in sealed environments)are commonly used pressure sensors in the IOET .

4) Optical sensors:

As they are immune to all forms of electrical interfaces, they are considered to be one of the popular sensors for IOET. They can be used in energy, health care, aerospace, chemicals, environment and variety of other IOET platforms. Optical sensors are well suited for oil refineries, mining operations, pharmaceuticals, and other chemical processing activities due to its no-risk components.

Wireless-sensor network (WSN) can easily be expressed as a network of nodes that collectively senses and controls the surroundings and ensures effective interaction between people / computers and their ensuing environments. It is formed by a large number of sensor nodes where each node is equipped with a sensor to detect physical phenomena such as light, heat, pressure etc.

WSNs have primarily four constituents:

- Sensor and its signal-conditioning circuit
- Microcontroller,
- Radio transceiver,
- Power source.

Over the past few years the first three components have seemingly benefitted from Moore’s Law and have rapidly grown in capability on one hand and their prices have dropped considerably on the other. Moore’s law, as we know refers to an observation made by Intel co-founder Gordon



Moore in 1965 who noticed that the number of transistors per square inch on integrated circuits (IC) had doubled every year since their invention. As this law suggests exponential growth, it cannot be forever. Moreover the power source doesn’t rely on silicon integration and hence it does not generally benefit from economies of scale. And hence dedicated wireless-sensor nodes at low prices would be a daunting task in the coming future and a major challenge for enhanced acceptability of IOET. However it is pertinent to note that applications and software can improve the speed and efficiency of computers in the future, rather than physical processes.

Usage of IOET:

Internet of Everything has the potential to transform all aspects of human life. A few of them have been enumerated above. Right from our daily household chores to our medical, professional, organizational needs, it has a solution for everything. The manufacturing industries, business houses, transportation, aviation, security, there is hardly any field which does not have applicability of IOET. It can help organizations achieve their financial goals. Implementation of IOET enables faster services and makes

it more accessible for the end use consumer. It could lead to significant enhancements in economic growth and productivity of nations. The goals for the IOET are primarily to interconnect various devices and secondly to ensure that all those devices are smart.

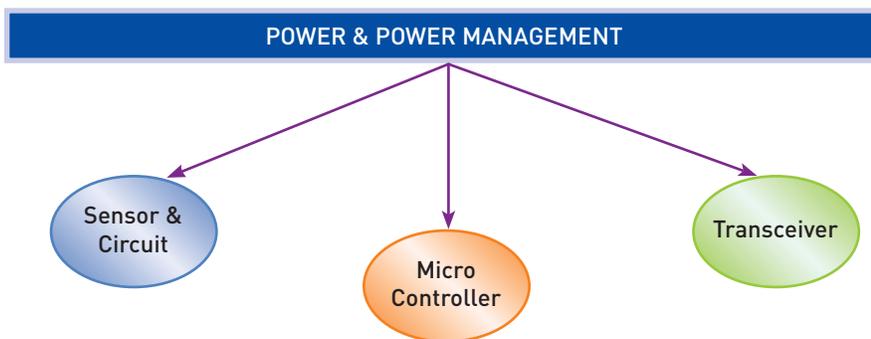
The impact is enormous when we consider its utility in the medical field for preventive healthcare. It could also lead to lowering of costs for diagnosis and prognosis. Sensor-based monitors can help in comprehending the disease at an earlier stage. Instead of relying on patients to fill the questionnaires about their health history and habits, sensors can do it more accurately and precisely. Networked medical information can easily combine results from millions of patients and thus suggest possible methods of treatment in an effective manner.

Another use could be in prevention of road / or rail accidents. For a country like ours where many rail accidents happen annually due to paucity of funds of rail safety and the railway lines being in constant need of repair, use of sensors could be the game changer .For example Ford’s Tool Link system builds sensors into vehicles, including the Ford Transit Connect .When the driver presses a button, the dashboard immediately displays an inventory of all onboard tools.

Sensors form the edge of the electronics ecosystem and facilitate the way in which the physical world interacts with computers. For large-scale sensor networks to become economically viable there has to be imperative focus on enhanced productivity and efficiency so as to offset the cost.

Benefits to organizations:

- IOET can generate better



information and analysis, thus enhancing decision making significantly.

- By embedding products with sensors, companies can track the movements of their products.
- Law-enforcement officers can get instantaneous data from sonic sensors that are able to pinpoint the location of gunfire.
- It can be used to detect leakages and wastes of factories flowing into rivers.
- It can be used to monitor pollution levels.
- Many a times the pipes burst and the water keeps flowing on the roads .Further there are instances of overflowing water tanks, which leads to wastage of water. IOET helps in detection of liquid presence outside tanks and pressure variations along pipes.
- Monitoring of water level variations in rivers, dams and reservoirs can be done by IOET, thus alerting the local population well in advance so that to loss of lives can be minimized.
- IOET can help in creating alerts about shift in tectonic plates. This prior information of even five minutes can help the affected people to leave the buildings in time and thus save numerous lives. IOET can also be effectively used

for monitoring of vibrations and material conditions in buildings, bridges and historical monuments.

Conclusion:

The full-blown, networked system of sensors probably may be a few years away, but an example of a smaller sensor network within buildings is implementable. For example buildings can be made smarter (energy efficient) with the help of a network of sensors to determine individual usage along with temperature, humidity and preferences.

IOET is not restricted to formal network architectures. They can also be formed around personal mobile-communication devices. Majority of people use smart phone these days, which has a variety of sensors. For example, the iPhone senses the location, direction, sound, and images through its GPS (global-positioning system), accelerometer, digital compass, microphone, and camera. Some of the common uses of sensors we see in day to day life are smoke detectors, fire alarms, water flow detectors in taps etc.

For those who believe that this technology is west oriented or for the developed economies, I would like them to remember the ridiculing of initiation of computerization in India in the late eighties. And see after thirty years how India has transformed. It is the cyber technology prevalent in all walks of life. Be it banking, shopping,

booking of airline, railway or bus tickets, filing of ITR, in all walks of life cyber technology is ubiquitous. This is a colossal fundamental shift in the way we think about our world. It is not sci-fi, it is the need of the hour to embrace this new technology so that we all can lead better and secure lives. IOET helps in transforming data that could be used to make macro decisions about resource utilization.

Information is a great way to reduce waste and increase efficiency, and that's really what the Internet of Everything provides. Undoubtedly there will be hurdles in implementing IOET and some of its abilities may seem exaggerated today, but it certainly has the potential to change the world we live in and make it more efficient and environment-friendly. There will always be challenges related to security, privacy, and reliability of such a game changer technology .Hence there should be active discussion and cooperation between all stakeholders. Privacy is an area which needs lots of discussion. In the name of ease or security, the fundamental rights of citizens should not be taken away. IOET is an excellent technological advancement wherein machines are supposed to make our lives easy and convenient, but it also needs to be ensured that humans control the machines and not vice versa. ■

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Internet of Everything versus Internet of Things

► **Moreshwar Salpekar**
CSI Life member

Introduction

Internet of Things (IoT) has become a buzzword. Sensors and intelligent devices are becoming common place. Cisco coined term Internet of Everything and this term has also spread. This begs the following questions

1. What is Internet of Things?
2. What is Internet of Everything?
3. What are similarities and differences between the two?

The article attempts to answer these questions. First let us look at the definitions of Internet of Things and Internet of Everything.

Definitions

Internet of Things

ITU, in its recommendation Y.2060¹ defined the following terms

Internet of things (IoT): A global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies.

Thing: With regard to the Internet of things, this is an object of the physical world (physical things) or the information world (virtual things), which is capable of being identified and integrated into communication networks.

Device: With regard to the Internet of things, this is a piece of equipment with the mandatory capabilities of communication and the optional capabilities of sensing, actuation, data capture, data storage and data processing.

The overview of IoT can be explained using above figure

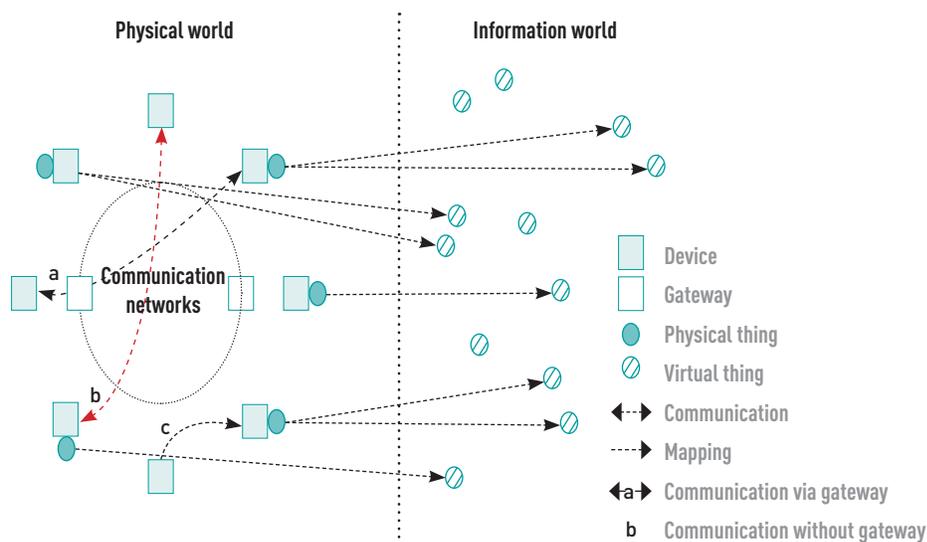


Figure 1: IoT Overview²

From above diagram it can be seen that there is a mapping between things in physical world to information world. This mapping is required because things need to communicate and thus need to be represented in information world also. Further, each thing that is mapped from physical to information world has a device interface. This because it is a device that has mandatory capability of communication and hence can be addressed in information world. It should be noted here that a physical thing may be represented in the information world via one or more virtual things (mapping), but a virtual thing can also exist without any associated physical thing.

Internet of Everything

CISCO is believed to have coined the term "Internet of Everything (IoE)". Qualcomm also used term IoE until

it dropped the usage in favour of IoT. According to CISCO, The Internet of Everything (IoE) "is bringing together people, process, data, and things to make networked connections more relevant and valuable than ever before—turning information into actions that create new capabilities, richer experiences, and unprecedented economic opportunity for businesses, individuals, and countries.", (Cisco, 2013) .

IoE encompasses the following

- **People:** As of today, most people connect to the Internet through their use of devices (such as PCs, tablets, TVs, and smartphones). It is envisaged that under IoE, people will be connect for more than just browsing or social media. Already people are controlling their home devices such as air conditioners, TVs, lights from remote locations

¹ Extracted from ITU T Recommendation Y.2060

² Extracted from ITU T Recommendation Y.2060

and viewing their homes through remote controlled cameras.

- **Data :** Currently, devices report raw data. It is expected that connected things will soon send higher-level information back to machines, computers, and people for further evaluation and decision making. This is the basis of fog and edge computing where data is analysed at edge of network by devices and the information (processed data) sent over network to cloud for further processing.
- **Things :** Things are devices with mandatory communication and optional sensing capabilities³. As said above, in future, things will become context-aware, and provide better information to aid in decision making.
- **Processes :** The processes bring together people, data and things in order to deliver more value in the connected world. They also ensure that right information is delivered to all concerned in time and in correct way.

The conceptual diagram is given below.

When coupled with Data Analytics and Machine Learning, IoE is expected to impact business strategies, human interaction with technology and technology adoption. Data will be generated by things, and possibly analysed. Machine Learning based systems will be able to analyse data to draw inferences and make decisions. Some organisations are expected to change their model from product-based to service based. Already some organisations have shifted to device centric model and solutions, e.g. smart gas networks. Humans have also changed the way they interact with technology, e.g. switching on air conditioner from remote location when on way to home. The solutions in market already can track humans and their activities, e.g. cardio monitors connected to doctor network.

Similarities between IoE and IoT

Looking at ITU recommendations, primarily Y.2060 and Y.2066 for IoT and documents for IoE including CISCO on Internet, the following similarities are seen:

1. Both rely on devices and things: Things are identifiable objects that can be integrated into IoT and IoE.

Devices are producers of data.

2. Both involve data generation and transmission. Devices such as sensors generate data which is transmitted over communication networks and is processed by machines such as computers.

Differences between IoE and IoT

In general, IoE has four pillars: People, Things, Data and Processes. Therefore, IoT is a pillar of IoE as per se. As per Dave Evans, Chief Futurist Cisco Consulting Services: IoE further advances the power of the Internet to improve business and industry outcomes, and ultimately make people’s lives better by adding to the progress of IoT.

The following differences can be identified

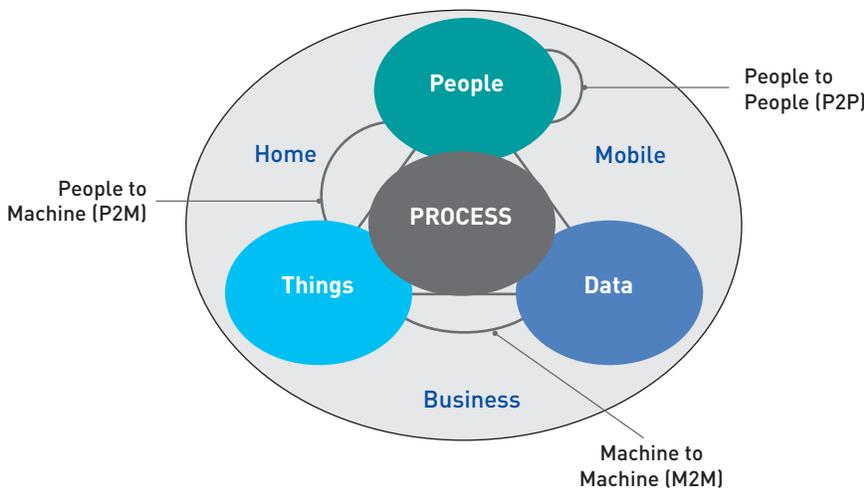
1. IoT does not include people. Although people interact with IoT but they are not considered in IoT generally.
2. Things are not required to be context aware in IoT whereas it is expected in IoE that things will be context-aware.
3. Although data flows between things and between devices, IoT definition does not include data. IoE has explicit mention of data. The data may be raw data or information (analysed data).
4. IoT does not include processes. IoT is about connecting things. There is nothing that says how to bring things together and how and what data is to be used. On the contrary, IoE includes business and industrial processes that brings things, data and people together.
5. IoE has no distinct definition of “device” in contrast to IoT definitions from ITU.

IoT and IoE examples

Few examples that can help understand IoT and IoE are given below:

Lighting Systems that control light hues and intensity based on various measurements are very common products available. To this add a

Internet of Everything



Source : Cisco IBSG, 2012

Figure 2: Interconnection Diagram in IoE⁴

³ See Internet of Things section for full definition

⁴ Extracted from The Internet of Everything How More Relevant and Valuable Connections Will Change the World by Dave Evans

Role of Sensors for monitoring Water Quality to improve the Public Health

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Introduction

A sensor is the equipment that detects and responds to the external stimulus from the physical environment. The external stimulus includes: motion, light, heat, moisture, pressure or any sudden changes in the environment. The output of the sensors is generally a signal which can be converted into human – readable form. All the sensors are very sensitive to small changes. So, most of the sensor’s size is very small.

In general sensors are categorized based on the power or energy supply requirement of the sensors, as follows: Active and Passive sensors. Active sensors are sensors that need power supply to be active. On the other hand, Passive sensors do not require power supply to work. Based on the output they produced, sensors may be classified as Analog sensors and Digital Sensors. Analog sensors are fabricating a continuous output signal which is generally relative to the quantity being measured. Digital sensors produce a digital representation of the quantity being measured.

Water Contamination

In most part of the world, ground water is the only and important supply for production of drinking water,

particularly in areas where water supply is limited. Nearly two-third of all drinking water supply is obtained through groundwater resources worldwide. Groundwater contamination will directly affect human health because excessive amount of contamination in drinking water can produce negative impact of health on human – beings.

Need for sensors in Water Contamination

Access to safe drinking water is important as a health and development issue at national, regional and local level. The population in rural India mainly dependent on the ground water as a source of drinking water. High rates of mortality and morbidity due to water borne diseases are well known in India [3]. Severe degradation of water quality in urban India has often been attributed to unsystematic disposal of sewage and industrial effluents into surface water bodies. Those at greatest risk of water borne diseases are infants and young children, people who are debilitated or living under unsanitary conditions and the elderly.

As India is a developing country and it has wide-spread emerging technologies, there is a need for system

for timely help and to monitor water pollution on the total state of the water system. Moreover, suitable equipment is necessary for accurate process control and the environmental monitoring field need to be developed. For source water and environmental monitoring, process control instruments are needed and that can be employed on in-situ and the process is monitored remotely.

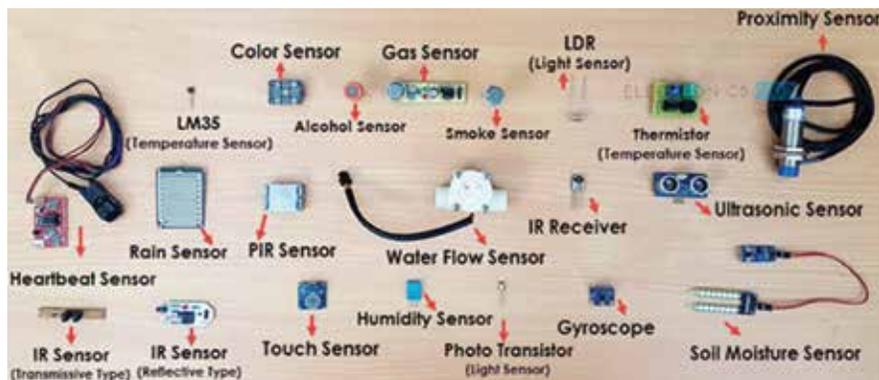
Parameters examined

Upon the widespread experiments carried out by US Environmental Protection Agency (USEPA) [6], resolved that both chemical and biological waste has an adverse effect on many water monitoring parameters such as pH, Turbidity (TU), Electrical Conductivity (EC) and Oxidation Reduction Potential (ORP). In order to detect the water contamination or impurities, it is enough to determine the changes in the above said parameters. If there is any deviation when compared to that of the drinking water standards recommended by WHO [4] or with the Central Pollution Control Board (CPCB), India [5]; then the water is not safe for drinking. In many bodies of water, contamination of herbicides, pesticides and heavy metals may also be taken into account while calculating the water quality measurement.

Table 1 suggested the standards for the parameters to be used. It represents the measured cost associated with the corresponding parameters based on [8], the lifetime of the parameter, compensation and calibration procedure and measurement and instrumentation methods.

Sensors employed

Though chemical sensor arrays have limited life span, a large number of water quality monitoring systems have proposed [9&10]; because of its low cost and operate accurately.



Different types of sensors [1]

Table I – Suggested parameters to be monitored [7] for safety drinking water

	Parameter	Units	Quality range	Measured Cost
1.	Turbidity	NTU	0 – 5	Medium
2.	Free Residual Chlorine	mg/L	0.2 – 2	High
3.	ORP	mV	650 – 800	Low
4.	Nitrates	mg/L	<10	High
5.	Temperature	°C	—	Low
6.	pH	pH	6.5 – 8.5	Low
7.	Electrical Conductivity	µS/cm	500 – 1000	Low
8.	Dissolved Oxygen	mg/L	—	Medium

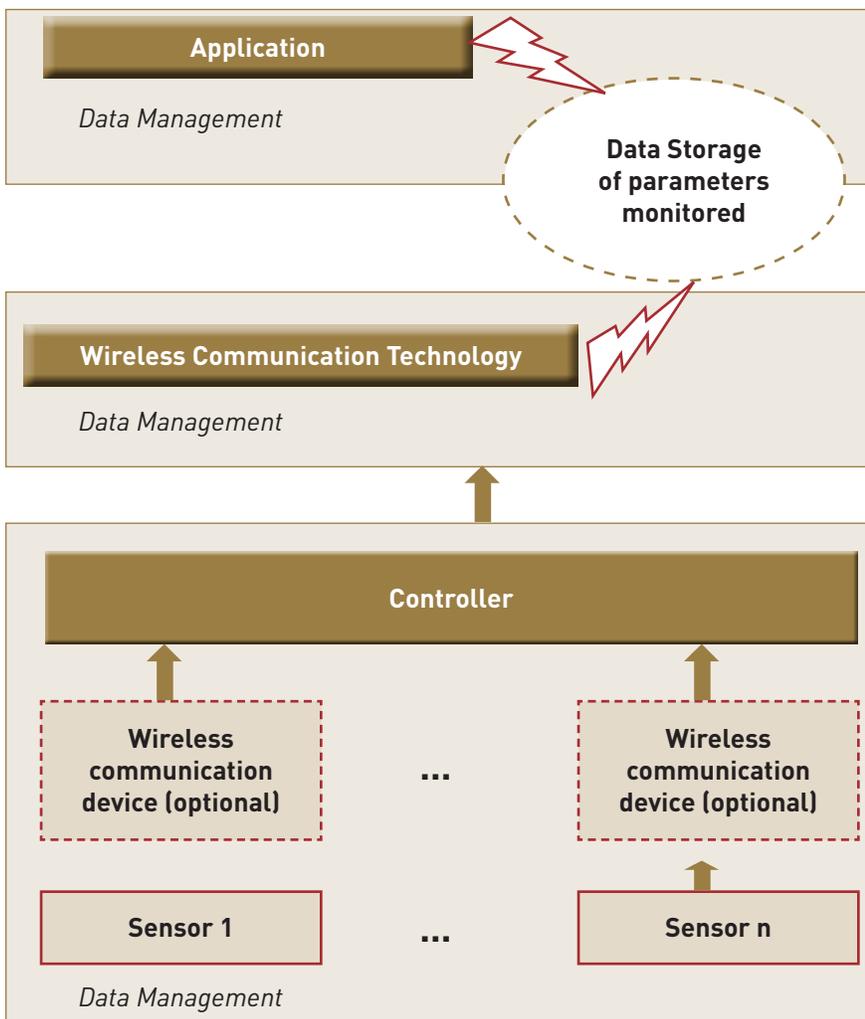


Fig. 2 : Block Diagram of Water Quality Monitoring System based on Sensors [15]

Commercially available online water monitoring systems are mostly reagent-free [11-13]. But these systems are expensive and bulky. In [14], a new patented fresh water monitoring device using high-resolution time series were

demonstrated. But the life span of the device was very limited i.e 9 days.

Block diagram of Online Water Quality Monitoring System (OWQMS)

All OWQMS, is divided into three sub-systems:

- i) Data Collection: Through sensors all the water-quality related data are collected and stored in the local-Controller.
- ii) Data Transmission: Once the local-Controller receives the data; it then transferred to the Cloud for analysing the data.
- iii) Data Management: Cloud storage acts as a bridge between Data Transmission layer and the Data Management layer. Through Cloud storage, the data will be transferred to the end-user.

Domestic water supplied form Municipal Corporation or directly taken from the ground water are mainly used for drinking and cooking purposes. The Bureau of Indian Standards [2], gives details about the permissible limit of all minerals in drinking water. Traditional water supply management involves: storing the pool of water at various locations and distributing the same through water head tanks and domestic pipelines.

Conclusion:

The main objective of this study is to show the role of sensors for the betterment of water quality in order to obtain a hygienic environment. According to the study, drinking water obtained from both groundwater and surface water; must satisfy the standards for safe drinking water. This paper gives a clear view about what is a sensor, different types of sensors, parameters to identify quality of water, and stages to create online water quality management system.

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Contd. from page 22

capability to control lights and their hues using a web app, for example, Philips Hue Lighting System is an IoT product. It can control lighting using a web app and bridge. This system lets people communicate with system and play with hues, it becomes IoE.

Another example of IoE is August smart lock: it locks automatically when you close door and unlocks when you come home. It can be controlled by authorised user using mobile app. It has a local keypad that can be used in case mobile is not available. It can record logs of usage and also authorised persons can grant access remotely. Within this IoE system, IoT part would involve just recording usage or identify person or informing authorised user or locking/unlocking by just detecting

presence or authorised user and there would be no interaction with users. Smart camera detects a person and informs the locking system to check and the locking system taking action is an IoT system whereas an IoE system would allow involvement of user.

One more example of IoE is a smart grid and associated advanced metering infrastructure (AMI). Smart grid and associated AMI is a full system. There is data flow, there are people that interact with grid (operating staff and consumers). There are things that measure data and can be used to control smart grid operations. There are processes defined that bring people, data and components of system. In contrast, IoT would be just measuring electricity usage or sensing shortage of

electricity supply somewhere.

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Sensors for Internet of Everything

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Introduction

In the emerging technological world, people are connected with devices. Enhancing the power of this new proliferation of devices and their inter-connectivity paves way to the global development. Internet of Everything (IoE) is based on the concept that does not restrict internet connections to laptops or desktop computers but to a wide range of devices that becomes a part of the physical environment. In general, machines are considered to be smarter and creates new capabilities, richer experiences and unprecedented economic opportunities by having access to more amount of data that can be further used in processing preceded by analysis. In short, the Internet of Everything connects the unconnected[2], bringing together the components shown in Fig.no.1

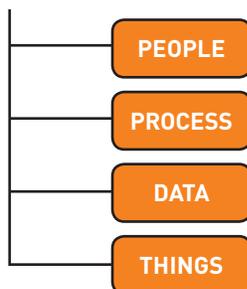


Fig. 1 : Components of IOE

IOE VS IOT

IoE is a concept that extends IoT but there are drastic differences among them. The internet of things, in its broadest conceptualization, includes any type of physical or virtual object or entity that are addressable and given the ability to transmit data but in a single way. Things like sensors, RFID, NFC, etc are used. However, the communication is one way and is termed as "internet like" networking. The devices talk to the readers like RFID that can gather information and

send through the cloud or any of its kind. The involved environment cannot communicate back to the sensors or devices or The Internet of Everything on the other hand includes user generated communications and interactions associated with networked devices. IOE offers a two-way communication that is based on TCP/IP networked devices to send data. It is an internet communication itself. This resembles the actual real -world networking. Devices can not only send data but also use data and work based on them.

As things add capabilities[5] such as context-awareness, increased processing power, and energy independence, IoT becomes IoE which proves to be a network of networks where billions of connections create unprecedented opportunities and new risks. As the Fig. 2 depicts, let us consider the real-world scenario of operating an air condition at home through laptops/tablets/mobile phones by intimating the temperature, moisture and other settings by the user.

This is under the roof of internet of things(IoT). The same situation is

taken for instance for briefing IoE. While the user enters the car and is/ her destination is home, then the mobile device (with the help of GPS) sets the air conditioner in an ON state at a particular time with the preferred setting of the user (already existing) without any human intervention.

To achieve the abstraction of heterogeneity of the devices and representing the functionality as a virtual computing platform, pervasive computing is used. The information is represented with semantic web-knowledge and Global IoT is divided into various smart spaces maintained by SIBI (Semantic Information Broker). Moreover, the method of understanding the data produced by the data providers and the related context is context-based IoE. Acquisition, modelling, reasoning and distribution are the various techniques available for context-based IoE.

IoE Architecture

From connecting devices to human value the Fig. 3 describes the various levels involved in the Internet of everything. The device connection

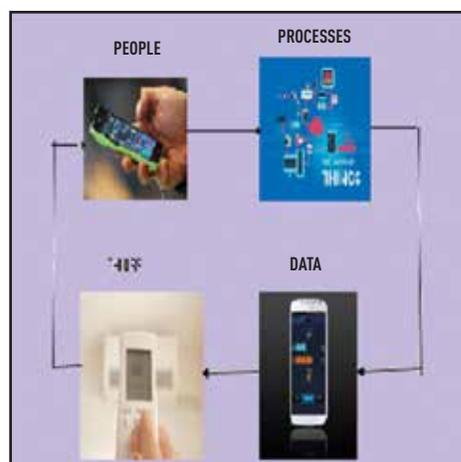
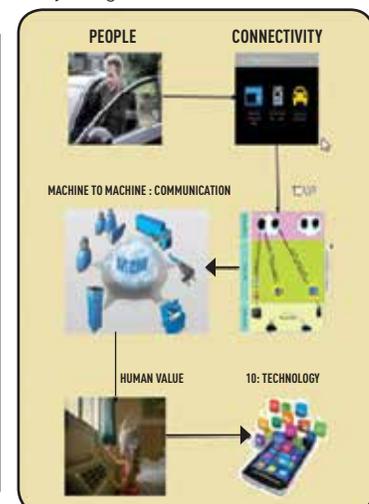


Fig. 2 : IOE vs IOT



includes the devices, their connectivity and the embedded intelligence. Data Sensing phase involves capturing the data from the sensors, tag contribution and the information storage. Communication focuses on accessing the networks, cloud, edge and involves data transport. Data Analytics introduces the functionality of AI and cognitive science and brings data value into action. Human value is majorly concerned with smart applications, stakeholder's benefits and tangible benefits.

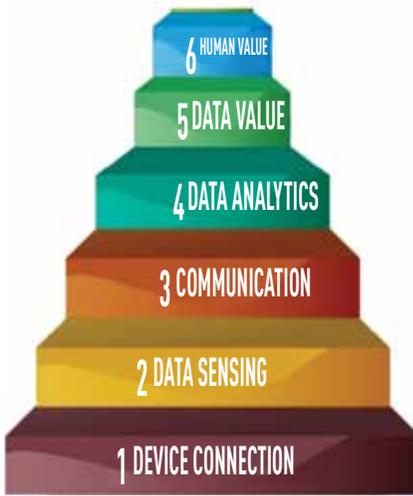


Fig.3 : IoE Architecture

Sensors

Sensors are defined as the sophisticated devices which aids to detect and respond to electrical or optical signals. It converts the physical parameter(temperature, blood pressure, humidity, speed, etc.) into a signal that can be measured electrically.

Classification of Sensors

The sensors can also be classified based on the following criteria and conditions: Primary Input quantity[3], Transduction principle, Material and Technology, Property Application. Fig. no.4 represents another category of sensors.

Uses of Sensors in IOE

The major backbone that is needed for the implementation of the IOE are connections. It's the sensors that play a very major role connecting various devices. The sensors can be viewed not only as a connecting device but also as

a device of :

i) Identification:

The RFID, one of the popular sensors uses small tags called "RFIDTags" and an RFID reader to communicate information . The RFID tags are used to identify the objects in which they are embedded to. The RFID tags in IOE is flexible and consumes low power which proves to be its major advantage.

ii) To collect data from various computers and other computing devices

Sensors of all types are fundamentally important to connect the devices that was usually unconnected. The collected data, which will be in the physical form are converted into electric signals.

iii) Programmed to take measurements:

Sensors can be programmed to take measurements with varying units with large computational processes in Internet of Everything and differing aspects.

Properties [1]

- ✓ Unique addressable object
- ✓ Unique location within a network
- ✓ Information-processing by machines
- ✓ Surpasses humans as networks join up
- ✓ Complex interoperability require intelligent analytics, security and

management

Applications

The evolution or a drastic uplift in technology majorly occurs due to requirements of the user. As companies digitalize both the product and the process, the Internet of Everything will invent various aspects of its applications as shown in Fig. 5

a) Medical Aspect

The IoE demands an intelligent network- a distributed application centric networking the processes data and things that were just unimaginable, in healthcare that was impossible in recent past. There are many architectures that were built on this area such as Medical grade network architecture which provides a lot of positive features such as protectiveness, interactive nature, resilient and responsiveness. Services are: Alignment with business priority, improve operational efficiency.

b) Retail

Retailers were mostly reluctant in implementing internet into their strategies, but the IoE has the power to encourage them to hyper-locally promote the business in a time specific, targeted way. Moreover, it is also used to gather intelligence about the user.

c) Business

Business process, its models and its moment are the business-oriented applications implementing the concepts IoE. These are reasoned by the need

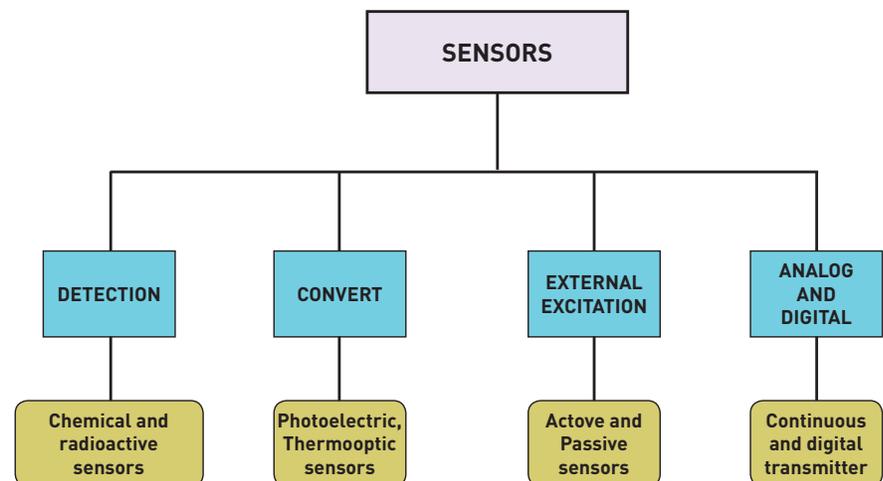


Fig. 4 : Classification of Sensors

to compete with the unprecedented business velocity and agility[4].

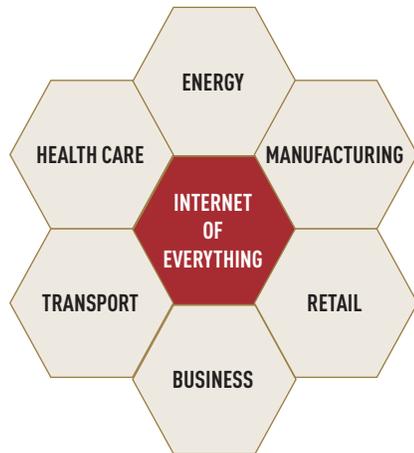


Fig. 5 : Applications of IoE

d) Transport

Intelligent transport are abundantly found around almost all industries and are found in the following

- ✓ Inventory and supply chaining
- ✓ Reservation and ticketing
- ✓ Smart vehicular application.

The fleet telematics integrated with the security and surveillance systems are also certain usage of the IoE concepts in Transport system.

e) Energy

IoE can be sometimes misinterpreted as Internet of Energy which is factually applicable from an applications's point of view. It refers to automating and upgrading the electricity infrastructures for producers. IoE facilitated mechanics is used as power monitoring, distributed storage and renewable energy integration.

Trends in Applications of IoE

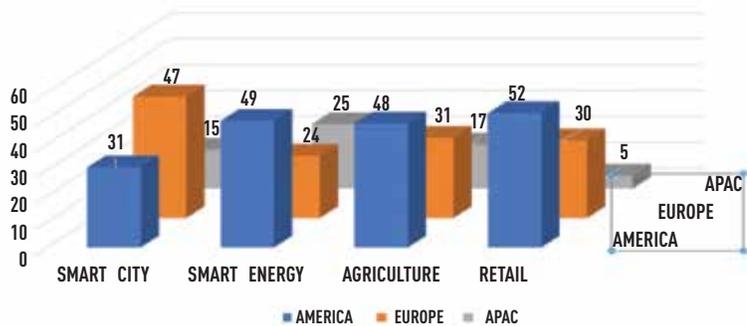


Fig. 6 : Application of IoE

f) Manufacturing:

Before IoE, manufacturers had less interactions with customers and was also a time-consuming process. With IoE, products and services include embedded sensors that provide constant data along with the genuine feedback. The innovative applications that has moved the world to an IoE based environment are smart watches and modern refrigerators.

Smart_Watches

It enables real-time GPS tracking, built in camera and remote sensing which currently provides protection, especially for women in emergency situations .

Refrigerators & Water Heaters

The smart application devices enhance their uses by providing accessibility from remote places. The notification to switch off water heater when not in use and other user interaction necessitates its operation.

Merits

- ✓ Automation
- ✓ Efficiency
- ✓ Communication and information and sharing
- ✓ Instant Data Access
- ✓ Flexibility
- ✓ Reduction in budget and cost

The disadvantages are insecurity of data, difficulty in modification of information, posing threat to employment in application.

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Integration of Sensor Based Hardware with Software - A Brief Review

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Integration of sensor based hardware and software is always a challenging task for any software professional. It demands thorough understanding of the hardware and its sensors, appropriate selection of architecture and languages to retrieve, clean, consolidate and finally displaying the data to the user console in easy to understand format. In this paper, reader will be exposed to the above with the help of a software for retrieving and displaying meteorological data for now-casting weather condition. This paper will be useful to students and professionals of Computer Science and Information Technology to decide suitable software technologies and languages to develop sensor based software with minimal effort.

Key Words: Interface, Distributed Architecture, C, Pro*C, Oracle, Java, GUI, Now-Casting.

Introduction

Automatic Weather Station comprises of several sensors to retrieve different types of meteorological parameters at a pre-defined time interval. Meteorological related information are extremely useful for weather prediction, avionics, navigation, conduct of firings etc. The basic purpose of the software is to provide important meteorological information like temperature, humidity, wind speed, wind direction, pressure, luminosity, rainfall etc at a desired time interval. Graphical User Interface(GUI) of the software is shown in Fig. 1, where different types of meteorological parameters are displayed at a particular time interval. In this figure, D-Temp and W-Temp denotes dry bulb temperature and wet bulb temperature respectively. Luminosity describes information related to visibility factor in Lumen. In the succeeding paragraphs, brief description related to software applications developed using distributed architecture based languages and its integration with the Automatic Weather Station is explained.

Automatic Weather Station

Automatic Weather Station (AWS) is an meteorological instrument that automatically captures various meteorological parameters from

different sensors. All measurements and calculations follow the World Meteorological Organization guidelines. Brief description of various sensors related to AWS are provided in Table 1.

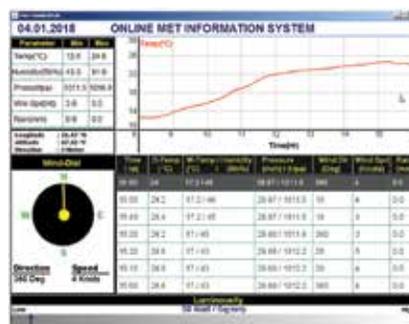


Fig. 1 : [GUI of the Software]

Table 1 : [Sensors Details]

Type of Sensors	Purpose	Frequency (Sec)
Thermometer	Measure air temperature	15
Barometer	Measure atmospheric pressure	15
Ultrasonic Wind Sensor	Measures wind direction and speed	3
Hygrometer	Measure humidity	15
Pyrometer and Radiation Shield	Measure solar radiation and luminosity	15
Rain Gauge	Measure rainfall	60

*Communicating Author

Sensors and Software Integration

The transformation of data from raw textual format to user readable format comprises different levels. The raw data collected by AWS sensors in Online Met Information System (OMIS) is fetched and processed. OMIS is also responsible for two way data communication with Oracle. Finally these data is displayed in clients using a user friendly GUI. The detailed architecture of the software is shown in Figure 2. OMIS is a critical application and amalgamation of various software development technologies.

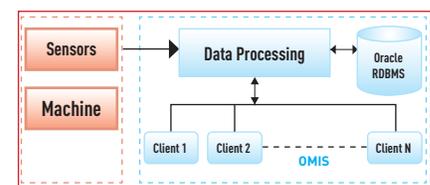


Fig. 2 : Software Architecture

Various flavours of languages like C, Pro*C, Java and Oracle are used to minimize development effort to realize the software. Usage details in OMIS is given in Table 2. It may be noted that the complete software is developed in less than 2600 lines of code.

Language & Arch		Usage/ Code Length
C	Single-Tier	System level coding /
Pro* C	Two-Tier	Database level coding / 100 Lines
JAVA	Two/Multi-Tier	GUI level coding / 1382 Lines
Oracle	Two/Multi-Tier	Backend Database

Table 2 : Languages used

Development of Software

C is a high-level language used to make fast, efficient, lightweight, scalable and executable applications. C is used in OMIS for system level coding, which provides extensive libraries for file operation and low-level extraction features. Pro* C is an Oracle tool to embed SQL Queries inside standard C, using its inbuilt Oracle library. The main feature of this language is to transfer text data to Oracle in tabular format. Pro* C is used because of its features like fast execution, compatibility with C and in built library support for Oracle. Java is suitable for GUI development, provides standard drivers to connect to a database, extensive library support and object oriented programming features. Java is used for front-end GUI development and database connectivity. Oracle is used to store all the meteorological data in a systematic manner for future data analysis.

Development of OMIS can be divided into three levels. The critical operation of extraction of raw data from AWS and processing is executed in level 1. In this level C language is used to extract data from multiple files of AWS machine, cleaning and time synchronization of data to a single file format. In level 2 these data are transferred to database table for systematic storage. Pro*C is used to transfer the collected processed data from AWS to Oracle table. Finally during level 3 these collected systematic data is presented to the user at remote location using user friendly application development software. Java is used to present the final output to the user in a user friendly manner. The utilization of these languages at different levels enhance the overall efficiency. Functionality and brief description

Functionality	Description
Max/Min Display Table	Contains information of max & min of five parameters i.e. Temperature, Humidity, Pressure, Wind Speed and Rain. With a fixed update period.
Temp, Pressure & Humidity Profile Graph	Represent graphical view of all Temperature, Humidity and Pressure of data with respect to time. Graph panel is designed with fixed X-Axis (Time) range of 0800 hr to 1600 hr according to requirement and variable Y-Axis whose range depends upon max & min data for current date & time.
Wind Dial Panel	Used to display the wind directions in a graphical manner using a rotating dial whose angle represent wind direction i.e. human readable format.
Met Parameters Display Table	Designed to display time synchronized data of all parameters of past one hour in time descending order and fixed update period.
Luminosity Gradient Bar	Is used to represent atmospheric visibility utilizing solar radiation intensity/(Power deliver/Area by the sun)/ Luminosity data from sensors on a linear gray color gradient.

Table 3 : GUI Description

of GUI of OMIS modules are shown in Table 3.

Test Results

The test results of OMIS related to temperature, pressure, humidity profile with respect to time are shown in Figure 3, Figure 4 and Figure 5 respectively. These figures also display max/min met parameters using a *Max/Min Display Table* along with instantaneous wind direction, wind speed and luminosity in a the circular *Wind Dial Panel* and *Luminosity Gradient Bar* respectively. All the met parameters for the last 60 minute duration (at a interval of 10 minutes) is shown in the *Met Parameter Display Table*. The basic purpose of the above display is to consolidate all the met parameters in a single place.

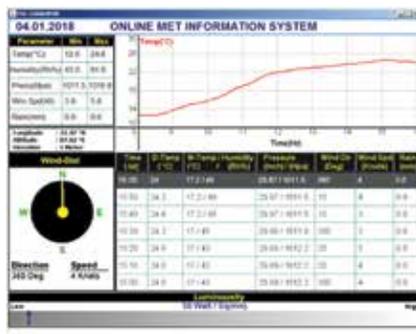


Fig. 3 : Temp Profile Graph

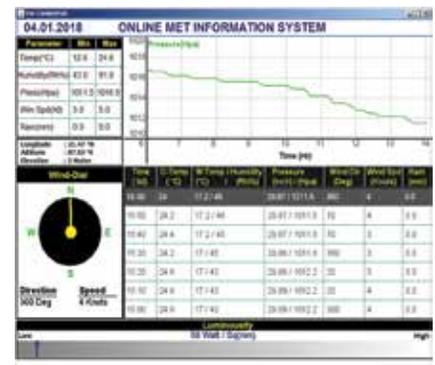


Fig. 4 : Pressure Profile Graph

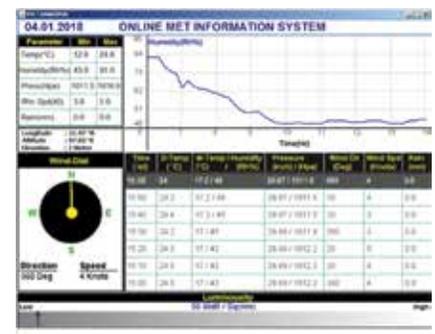


Fig. 5 : Humidity Profile Graph

The test results shown in Fig. 3, 4 & 5 demonstrate versatility of the software to extract raw data from AWS, cleaning, synchronizing, and transferring processed data in table and finally

presenting all the met information to the user for now-casting the weather condition.

Conclusion

In this paper selection of architecture and languages related to integration of hardware with software has been discussed. In this process, various sensors of the hardware, software aspects and functionality

details to realize a full-fledged software system are explained. This is followed by presenting few test results for better understanding of the system.

Acknowledgment

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CSI RVP 7 at 105th Indian Science Congress



Dr. M. Sundaresan, CSI Regional Vice President - Region 7 attended the 105th Indian Science Congress at Manipur University, Imphal from 16th - 20th March 2018 as a Sectional President of the Section of Information and Communication Science & Technology (Including Computer Sciences). As a President of this Section, he delivered Presidential Talk at the Session and has invited 15 Speakers for various Symposia Topics Related to Indian Science Congress : Reaching the Unreached Through Science and Technology. The Session had 150 Paper Presentations Including Platinum Jubilee Lecture, Invited Talks, Presentations (Oral / Poster). He has also Published an Exclusive Proceedings of the Abstracts of this Section. The Session was attended by Faculty members, Researchers and PG Students in the field of Computer Science from across the country. The Congress was inaugurated by our Honourable Prime Minister Mr. Narendra Modiji.

Sensors for Internet of Everything

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Introduction

On 29th October 1969, the first electronic message was exchanged between two computers over a computer network called ARPANET [1]. Twenty years later, Tim Berners-Lee and Robert Cailliau invented "World Wide Web (www)" which later revolutionized the world [2]. Though in the initial stages, it allowed only the posting and retrieval of static pages, but with the emergence of web 2.0, the user can now interact with the website as well as other users on the web more easily and freely. Few of the examples of web 2.0 applications are Facebook, YouTube and so on. Till now, the Internet was meant to connect people where they can interact with each other, share information by sending messages or even hold video conferencing. Apart from these man-to-man and man-to-machine interactions, machine-to-machine (M2M) interaction also became possible with the advent of web 3.0 which is also called as "semantic web" [3]. As a result, at each home, more than its people, things of the home are connected to the internet. These things can be any object – a mobile phone, television, bulb, air conditioner, an animal or even a plant. The simplest example of M2M interaction is the interaction between the temperature sensor and air conditioner i.e. Temperature sensor will sense the room temperature continuously. When

the sensed temperature increases beyond a certain level, it sends a signal to the air conditioner to automatically switch on. Similarly, when the sensed temperature falls below a certain level, it signals air conditioner to switch off automatically. Thus, any object can be made smart with the help of sensors, and when these smart objects connect to the internet and start interacting with each other, they form the **Internet of Things** [4].

Internet of Things (IoT) "is a network consisting of all physical and virtual objects, which are implanted with software, electronics, actuators, sensors and connectivity that enables it to connect to the internet using unique IP address for exchanging information with other connected devices". But the internet is not just a platform where only the physical devices are connected, it also connects people located at different locations, who interact with producers and consumers to satisfy human needs. It also provides services to make right information reach the right person at the right time. These services don't exist physically like Google website, DropBox etc. It is also made up of data streams that are communicated between connections which need to be analyzed, processed, control and leverage information more useful for decision. All of these different concepts when combined into one, form the **Internet**

of Everything (IoE) [5]. Thus, IoE is a platform where not just things, but also people, data and business processes can interact with each other [6]. According to Cisco, "Internet of Everything is an intelligent connection of things, people, data and process". Further quoted by Qualcomm about IoE is "IoE, a paradigm shift makes a new era of opportunity, for everyone from consumers and business to cities and governments".

The trend in IoE has also led to the development of micro and Nano level electronic devices with the capabilities ranging from identifying, communicating and computing which can be embedded in various devices, systems and facilities. The use of RFID, sensor and 2D barcode technology has helped to receive information about objects from anywhere and anytime.

2. Role of Sensors in IoE

Sensors are the heart of smart devices which make IoE [8]. They sense and monitor the environment where they are deployed by taking measurements and then communicate their gathered information via a network. The functionality of IoT, and the data transmitted in machine-to-machine and machine-to-people notions of the IoT, are determined by the nature of sensor measurements. Selection of sensor technology for IoT applications depends on the following three factors: size, price and capability. Digital electronics and mechanical components are combined together in these small sensors called Micro-Electro-Mechanical sensors (MEMS) that has the tendency to operate wider IoT applications. These small sensors can now be easily embedded into smartphones and wearables. Also, the decreasing price of these tiny devices has helped to reduce the IoT deployment cost. In a large system, these sensors are made smart by making it work with modem chips, improved computational



Fig. 1 : Key elements of IoE [7]

power microprocessors, power sources etc. But not every sensor is made the same and hence every IoT applications require a specific type of sensor.

3. Types of Sensors used in IoT

Based on their power sources, these sensors are mainly divided into two classes: "Active sensors and Passive sensors". The former one, emit their own energy and then sense the environment's response to this emitted energy. An example of an active sensor is Radio Detection and Ranging (RADAR) which is used to determine the range, angle or velocity of objects based on emitted radio waves. Unlike active sensors, passive sensors simply receive the external produced energy in any form. For example, in a standard camera, a passive sensor on receiving light as signal, will make the camera capture the image and then store it on device. Few of the sensors found in commercial markets are listed below [9-10]:

- **Position Sensors:** Used to measure the position of the object. These sensors are available in two types: absolute and relative. They are further categorized into angular, linear and multi-axis e.g. Proximity sensors which are commonly used in mobile devices.
- **Occupancy Sensors:** Used to signal the presence of people or animal in a surveillance area e.g. hotel room key card locks and smart meter.
- **Motion Sensors:** Used to detect motion of any living object e.g. automatic door openers in commercial and business buildings.
- **Velocity and Acceleration Sensors:** Velocity sensors record the speed of an object moving on a straight line or when it rotates. Acceleration sensor measures the change in velocity e.g. accelerometer, gyroscope etc.
- **Force and Pressure Sensors:** Force sensors detect application of physical force. If detected, then it checks whether the intensity of force applied exceeds threshold e.g. force gauge, touch sensor etc. Application of force per unit area is called pressure. Thus, pressure sensors are used to detect application of force by any liquids or gases e.g. Barometer

- **Flow Sensors:** Detects the rate at which the fluid passes through the system e.g. water meter.
- **Acoustic Sensor:** Measures sound levels with the help of acoustic waves. These waves are passed through the material or on the surface of the material. Any change in the magnitude or characteristics of the propagated wave, helps it to determine the corresponding physical quantity to be measured and then it converts it into digital or analog data signals e.g. microphone, geophone etc.
- **Humidity Sensor:** These sensors senses the presence of moisture in air or mass, measures and report it. Capacitive, thermal and resistive are the three types of humidity sensor e.g. moisture detector in soil
- **Light Sensor:** Existence of visible or invisible light is detected by this electronic device. Different types of light sensors are available e.g. photo resistor in which its resistance changes when light falls on it; Charge Coupled Devices (CCD) used in digital cameras where they transport electrically charged signals.
- **Radiation Sensor:** Detects presence of radiations in the environment e.g. neuron detector
- **Temperature Sensor:** Measures the quantity of heat or cold exist in a system. Temperature sensors are categorized into two types: Contact and Non-contact. The former one, must be in physical contact with the sensed object whereas the later one need not be in physical contact with the sensed object, as they can easily measure temperature using convection and radiation methods e.g. Thermometer, calorimeter etc.
- **Chemical Sensor:** Measures the concentration of target chemicals in a system e.g. CO2 sensor are used to sense carbon dioxide
- **Biosensors:** Detects chemical presence by analyzing a living organism or biological molecules, especially antibodies or enzymes e.g. blood glucose biosensor

4. IoT Applications

Devices are made smart by embedding these sensors into it. Such

sensors produce mountains of real-time data which needs to be properly handled in time to make quick decisions. With the advancement in computing, communication and big data analytics technology, many of the IoT applications are built to address universal human needs. Few of the applications are listed below [11-12]:

- **Smart cities:** Smart cities consist of smart parking, structural health monitoring of buildings, bridges and historical monuments, smartphone detection, traffic congestion, smart lighting, smart roads etc.
- **Smart environment:** This consist of fire detection, natural calamity early detection, air pollution monitoring etc.
- **Smart water:** This consist of river flood detector, chemical leakage detection in rivers, potable water monitoring etc.
- **Smart metering:** This consist of energy consumption monitoring, tank level monitoring, water flow monitoring etc.
- **Emergencies and security:** This consist of monitoring restricted area access, detection of presence of liquid in data centers, warehouses etc. to prevent breakdowns or corrosion, monitoring gas levels and leakage detection in the industrial environment or nuclear power plants etc.
- **Retail:** This consist of monitoring of storage conditions, tracking products etc.
- **Logistics:** Fleet tracking – monitors followed routes for delivery of valuable goods like drugs, jewels etc.
- **Industrial control:** Consists of auto diagnosis of machine and assets control, observing useful and toxic gas levels, temperature etc. in indoor environments.
- **Smart agriculture:** Monitors required climatic conditions for maximization of production. In dry zones, it helps in selective irrigation to reduce the water resources where not needed, moisture detection in soil etc.
- **Smart animal farming:** Consist of animal tracking, toxic gas level detection, offspring care etc.
- **Home automation:** Consist of

remote control applications, water and energy usage monitoring, intrusion detection systems etc.

- **eHealth:** Consist of patients surveillance, assistance to elderly or disabled independent people, self-monitoring wearable devices - for exercise tracking, for monitoring our heart rates and quality of sleep e.g. Fitbit and the Nike FuelBand.

5. Challenges in loE

loE has become the current trend as numerous global development opportunities have been accelerated with the tendency of improving Sustainable Development goals - dramatically increasing and developing millions of lives. But every developing field comes with challenges and few of the challenges are listed below [13].

- **Architectural blockades:** To have full advantage of loE, these devices needs to be fully connected to the Internet. In India, development in loE has to deal with environment challenges like and inadequate telecom and disruption in power supply.
- **Security and privacy threats:** Though smaller and smarter computing devices have begun to be integrated into cyber-physical-social environments, loE has also exposed these devices and users to security and privacy threats. User data are sensitive and hence it needs to be secured from various attacks in critical applications.
- **Interoperability & interconnectivity:** As different types of devices are connected to the Internet using different protocols, standardization is necessary for communication. Issues such as naming and addressing,

hardware compatibility, software compatibility, synchronization, wired and wireless infrastructure etc. needs to be addressed. The improving economies of advancing countries with minimal investments have developed a huge array of loE technologies with strong demands of interoperability and interconnectivity. These demands should be affordable, scalable and available to significantly improve people's quality of life. But with growing number of devices in loE, several connections may co-exist among devices which leads to network congestion and consumes more energy in communication.

- **Handling large amount of data:** Billions of devices are connected to the internet which generates more than petabytes of data. The increasing volume and velocity of data makes the data difficult to be stored at one place and retrieve the useful information from it in timely manner. The key challenge in data storage is to decide what to store and what to ignore among these received data.

6. Conclusion

In this paper, we have described the evolution of Internet of Everything and how it became the growing trend in the current market with the integration of key components: people, things, data and processes with the internet. Sensors are the heart of smart devices. They can be wired or wirelessly connected with the internet. They helps to remotely connect or monitor the network. So, we have described the different types of sensors used in loE applications. Decrease in size and cost of sensors and its capacity to be

easily get embedded with the highly computational microprocessors, has led in increasing demands of its use in different types of applications. We have listed few loE applications. loE capable applications are countless and they can work to optimize processes with a direct impact on society. We have also listed few challenges involved in loE. The more we are able to solve these challenges, the more benefit we can earn from loE.

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Entrepreneurship Summit-2018



▶ Prof. D. K. Dwivedi

Director (Capacity Building, CRC & E-Cell), Shmabhunath Institute of Engineering & Technology, Allahabad & Convener, E-Summit-2018

Some glimpses of the E-Summit & Startup Pitching Competitions



Entrepreneurship Summit was organized by the Entrepreneurship Cell, Shambhunath Institute of Engineering & Technology, Allahabad on March 9-10, 2018 in association with Kalam Centre for Innovation & Incubation of Startups (K-CIIS), Dr. A.P.J. Abdul Kalam Technical University, Lucknow, Uttar Pradesh (AKTU); Software Technology Parks of India (STPI), Ministry of Electronics & Information Technology, Government of India; Computer Society of India (CSI); Eastern U.P. Chambers of Commerce & Industries (EUPCCI) & Millionminds.

E-Summit was inaugurated with the lighting of the ceremonial lamp and addresses of eminent invited guests from reputed institutions. Dr. K. K. Tewari, Secretary, Shambhunath Group of Institutions extended floral welcome to the guests and presented Angvastram. He briefed guests & participants about the milestones achieved by Shambhunath Group of Institutions & UTTHAN within a short span of time. Prof. D. K. Dwivedi, Director, E-Cell, SGI in his address informed the guests and participants about the aim & objective of the E-Summit, Startup-Pitching/ Business Idea Competitions, E-Talk, E-Quiz scheduled during two days' event. He also briefed participants about the initiatives & activities of E-Cell, SGI. Prof. S. N. Upadhyay, Emeritus Professor, DAE Raja Ramanna Fellow & Former Director, IIT BHU in his address talked about Entrepreneurship & Entrepreneurs and discussed several case studies of successful entrepreneurs along with intricacies of entrepreneurship in respective cases. Prof. P. Nagbhushan, Director, IIIT, Allahabad in his address talked about Entrepreneurship: Opportunities & Challenges in India and advised participants specially students to dream big & aim big and accordingly groom themselves to be successful in the career. Prof. P. K. Mishra, HoD, Chemical Engineering & Coordinator, Malviya Centre for Innovation & Incubation of Startups (MCIIS), IIT BHU in his address discussed about "Innovate to Serve" and enlightened students about the innovations carried out by various social as well as charitable organisations including MCIIS, IIT, BHU. Er. Rajneesh

Agrawal, Director, STPI, Noida enlightened audience about the organization structure & infrastructural facilities of STPI in different cities, Government Policy of supporting Startups, Call Centres as well as various initiatives & activities of STPI in innovation & incubation of Startups. Dr. G. S. Darbari, Managing Director, Darbari Industries & Past President, Eastern U.P. Chambers of Commerce & Industries shared his entrepreneurial journey and also discussed about the entrepreneurial opportunities & risks in various sectors in city like Allahabad. Er. Ajay Chaturvedi, CEO, Harva (Harnessing Value of Rural India)- An NGO emphasized the need to accept the challenges of entrepreneurship for the progress of rural India and motivated students by citing several examples from mythological scriptures. He also briefed participants about the social entrepreneurship work being done by Harva. Er. Praveen Dwivedi, Dy. Director, STPI, Lucknow showcased the facilities established by STPI in Noida, Lucknow, Allahabad, other cities of U.P. and nearby States along with core activities of STPI. He also discussed about the Incubation Centre, Startups being incubated at present at STPI Centres and opportunities for the students to establish their Startups. Er. Shivesh Gaur, CEO, Emyrean (An Allahabad based Startup manufacturing drones & imparting training to students) discussed about his entrepreneurial journey, challenges faced in registering his venture as Startup and the activities of Emyrean. In E-Talk Session, Er. Mohit Nayar, Founder, Lawyers of India & Er. Piyush Agrawal, Founder, Happy Cultures, ThEnGa shared their success stories/ challenges faced and explained the art of preparing good business Plans to attract angel investors as well as sustain the Startup business. E-Quiz was organized by the E-Cell SGI student volunteers to generate an appetite amongst students to become aware about the current happenings and test their entrepreneurial knowledge. Surprise gifts and goodies were given to those who promptly gave correct answers.

Summary of the Startup Pitching Competitions

Startup/ Business Idea Pitching Competition	5th Edition of Dr. Kalam Startup Parikrama organized by K-CIIS, AKTU with support of TEQIP Phase-III	The Startup League-Allahabad Chapter organised by Millionminds with support of Startup India programme
Winning Teams	I - Hybrid Refrigerator - AITM, Varanasi II - Sangam Trip Advisor - SIET, Allahabad III - E-bicycle -AIT, Varanasi	I - Obalish of MNNIT, Allahabad II - Apna Ghar of SIET, Allahabad III - V4U of MNNIT, Allahabad
Jury of experts	Sri Saurabh Singh, Consultant, K-CIIS Sri Abhishake Nandan, Consultant, K-CIIS Er. Shivesh Gaur, CEO, Emyrean	Er. Mohit Nayar, Founder, Lawyers of India Er. Piyush Agrawal, Founder, Happy Cultures, ThEnGa & Millionminds team
Prizes to the winners	Cash prize of ₹ 10000.00, ₹ 5000.00 & ₹ 3000.00 respectively	Ticket to Grand Finale of "The Startup League" to be organized in Metros.
Remarks	11 innovative business ideas were shortlisted out of 175+ online submissions for pitching competition.	9 innovative business ideas were shortlisted out of 120+ online submissions for pitching competition.

E-Summit was a great success with 200+ participation from Academia, Industry, Government, Startups and students of engineering, management & pharmacy streams from various Institutes affiliated with AKTU and other Universities.



CSI Student Conventions

Regional Student Conventions

Region-I



The CSI Regional Student Convention (RSC-2018) was organized by CSI Student Branch of Dronacharya College of Engineering on 23rd–24th February '18 at Dronacharya College of Engineering, Gurgaon. The Theme for the Convention was "Advancement in Technology and Real Time Challenges" (ATRTC-2018)". The objective of the regional convention was to provide a platform for the students to interact and exchange ideas, experience and expertise in current trend. The Convention offered excellent opportunities to the students to manifest their technical proficiency and prowess through coding and designing events and extensive interactions with peers and pioneers. The Chief Guest for the inaugural ceremony was Dr. Sujit Banerjee (Scientist F, Department of Science and Technology, Government of India). The distinguished guest was Mr. Arvind Sharma (Regional Vice President, Region-1, CSI). Mr. Saurabh Agrawal (Delivery Head, Healthcare Products and Platform, TCS), Mr. Vikrant Satsangi (Manager Education Advocacy, Microsoft) and Mr. Abhineet Ranjan (CEO, Ranjan Industries Pvt. Lt. Delhi) shared the dias during the inaugural ceremony of the convention. During the two days of the convention, around 900 participants and volunteers were assembled including 200 outside participants from IIT Kharagpur, Maharaja Surajmal Institute of Technology, GD Goenka University, Manav Rachna International University, Northcap University, Delhi University, GNA University Punjab, PM College Sonipat, Netaji Subhash Institute of Technology etc. The events organized during the convention were prototype exhibition, paper presentation, 3-D designing, mobile app mock up, cod-a-thon, poster presentation, monster Gaming, photography competition, robo-combat, treasure hunt, theme based rangoli contest and workshops on Azure, Cloud and GitHub. The valedictory and award distribution ceremony was organized on 24th Feb 2018. The Chief Guest for the closing ceremony was Mr. Shanker Ramasamy, National Student Coordinator, CSI. He presented trophies, cash prizes, robotic kits and training vouchers to the winners and certificates to all the participants who participated in the events. RSC 2018 gave the students a platform to enhance the awareness on technical developments to foster creative professional orientations among the academic community and the coordinators received positive feedback from the participants.

Region-V



CSI Student Branch of NBKR Institute of Science and Technology, Vidyanagar, Hosted the two days CSI Regional Level Student Convention for Region-V on 28th and 29th December 2017. The event was inaugurated by Sri. Raju L Kanchibhotla and Mr. N Srikanth, Senior Project Manager, Tech Mahindra, Hyderabad, Dr. V Vijayakumar Reddy, Director, Dr. S Maruthuperumal, HOD CSE and SBC-CSI, Prof. M Nataraja Suresh. The Guests addressed the gathering from different engineering colleges in AP, Karnataka, Telangana and Tamil Nadu have registered for the different events such as Paper Presentation, Poster Presentation, Technical Quiz, Mobile App Mockup, E-Biz, IOT Expo, Ethical Hacking Contest, IOT Workshop. The two days event went on with overwhelming response from the participants. Winners and Runners on each event were recognized by giving electronic gadgets as prizes.

Region-VI



Vishwakarma Institute of Information Technology, Pune had conducted the CSI Regional Student Convention on the theme "Techno Vishwa" on 2nd and 3rd of January 2018. Region VI of CSI comprises of the state of Maharashtra and Goa. The convention saw active participation from both the states as well as from all over the country. The aim of the Convention was to bring all technical minds together and give them a platform to showcase their talents. Mr. Manish Prabhu, Director, IT Security, Microsoft as the chief guest and Dr. M.U. Kharat, Regional Level student coordinator of Region VI of CSI as the Guest of Honour. Different events were conducted during the two days including Panel Discussion. The agenda was "Preparing for change in IT Industry needs". Experts from

different fields got together to discuss the most burning topic. Other events included Earn Code, Role Play, Techno-Hunt, Web Design and two more workshops based on the trending topics of Business Intelligence Tools and Privacy and Security in Online Social. All the events received overwhelming responses and one of the events, Earn Code earned more than 100 entries itself which is an achievement. The main objective is to provide opportunities and platform to show technical talent and providing the knowledge of current ideas in technical education and role of student in IT sector. It helped students to improve team spirit, interact with industry experts and to enhance and enrich updated technical knowledge demanded by industry.

Region-VII



CSI Student Branch of Jeppiaar Engineering College, Chennai hosted the Regional Student Convention for Region-VII on 23rd and 24th January 2018 on the theme Digitizing the World and Booting the Better Future. Mr. T R Vasudeva Rao, Chairman, CSI Chennai Chapter inaugurated the student convention and spoke on the occasion. Ms. Angeline Premkumar, Talent Acquisition, Infosys spoke about HR. Other eminent speakers spoke on the occasion. 220 students from various Engineering institutions attended the event. Varieties of events such as Paper Presentation, Quiz, Disrupt, Google It, Web Designing, Coding Competition and Poster Designing etc were also conducted.

State Student Conventions

Andhra Pradesh



The CSI Student Branch of GITAM Institute of Technology, Visakhapatnam has organized the state level student convention for Andhra Pradesh on 24 and 25 November 2017. The theme for the convention on Rising India - A step towards Digitalization. The chief guest for the event was Sri. R S Prasad Rao, Director of CtrlS, Hyderabad. The event was presided by

Prof. K Lakshmi Prasad, Principal & Dean, GITAM Institute of Technology. Sri. Anindya Paul, Hon Secretary, CSI Vizag Chapter, Sri. P Balaramu, Treasurer, CSI Vizag Chapter, Dr. P E S N Krishna Prasad, CSI State Student Coordinator, Prof. P V Nageswara Rao, Head, CSE Department, Prof. R Sireesha, Faculty Advisor, CSI GITAM Student Branch, Smt K Neelima Santoshi, Faculty Coordinator, CSI GITAM Student Branch and Mr. K Vinay, President, CSI GITAM Student Branch, along with the various participants from across the state were present for the event. The event was inaugurated by Sri. R S Prasad Rao and all the dignitaries, who took part in lighting a lamp marking the beginning of the two-day convention. All the dignitaries expressed their enthusiasm and wished the event to proceed successfully. Sri. R S Prasad Rao, was felicitated by the Principal and the other dignitaries were presented with mementos. The Chief Guest delivered the Keynote Address to the gathering, emphasizing on the importance of digitalization in the present scenario. He outlined four keywords for the success of digitalization: availability, reliability, scalability and security. The formal Vote of Thanks was proposed by Smt K Neelima Santoshi, Faculty Coordinator – CSI GITAM Student Branch. The event witnessed a participation of about 550+ students from colleges across the state

Gujarat



The CSI Student branch at G. H. Patel College of Engineering and Technology (GCET), V. V. Nagar (Region III) & Department of Computer Engineering, GCET organized a CSI Gujarat State Student Convention on 9th February 2018. The inaugural function was presided over by Dr. S. G. Patel, Hon. Secretary, CVM & Er. V. M. Patel, Hon. Jt. Secretary, CVM. As a chief guest of the function, Dr. Pritti Sajja, Secretary, CSI VV Nagar Chapter and Professor, PG Department of Computer Science, SPU addressed all the participants. The convention witnessed a participation of 343 students across the State. The program covered the keynote lecture by Ms Hima Patel on 'Machine Learning, Computer Vision & Natural Language Processing', tech talk by Mr. Dhruv Patel on 'Building & deploying your own Chatbot', project expo, and four exciting events. Innovative projects from various fields of computer science were showcased during the project expo. Putting their skills to test, participants competed with each other in fun and exciting tech & non-tech events. Valedictory ceremony was organized at the end of the program. Convener of the convention - Dr. Maulika S Patel, organizing secretary - Prof. Priyang Bhatt and Prof. Kinjal Joshi along with other faculties of the department were present. With prizes and certificates distribution the program was ended. The convention surely benefited the students and widened their perspective on the

technologies and how is it changing the world.

Tamil Nadu



The CSI Student Branch of S A Engineering College organized a State Level Student Convention for Tamil Nadu on the topic Techwaves on 5th January 2018. Dr. Viji Rajesh, Professional Body Coordinator gave the welcome address, Dr. P K Nagarajan, Principal, S A Engineering College gave the felicitation address, Dr. R Geetha, SBC delivered the speech about convention theme. Mr. T R Vasudeva Rao, Chairman, CSI Chennai Chapter delivered the Inaugural address and finally Prof. V Sujatha, MCA delivered the Vote of thanks. The convention ended with the valedictory function with Certificate Distribution for the participants and prize winners along with cash prizes of the events such as Paper presentation, Mobile App Development, Web Design, Poster Design and Technical Quiz.

Tamil Nadu



Karpagam College of Engineering, Coimbatore in association with CSI Coimbatore Chapter organized Two Days CSI State Level Student Convention on 21st and 22nd December 2017. Inaugural function held on 21-12-2017. Dr. S Manoharan, Principal i/c welcomed the gathering. The CSI Convention report was delivered by Dr. S Angel Latha Mary, HoD/CSE. The Chief Guest Dr. M Sunderasan, RVP-VII delivered the key note address. He discussed the benefits of CSI membership, active participation in various CSI programs. As a part of inaugural function II Yr CSE students developed a multimedia presentation about the recent IT Trends. The main motive of CSI Tamil Nadu State Convention is to bring out the competitive domain of students from within themselves and participate among various technical events. Totally 189 participants other than the host institution registered and participated in various technical events. Dr. D Bhanu, Vice Principal, Karpagam Institute of Technology, Coimbatore distributed the certificates during the valedictory function.

**Kind Attention :
Prospective Contributors of CSI Communications**

Please note that Cover Theme for **May 2018 issue is Digital Revolution in Speech and Language Processing for Efficient Communication and Sustaining Knowledge Diversity**. Articles may be submitted in the categories such as: Cover Story, Research Front, Technical Trends, Security Corner and Article. Please send your contributions by 20th April, 2018.

The articles should be 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 format to Editor, **Prof. Prashant R. Nair** in the email ids **csic@csi-india.org** with cc to **prashant@amrita.edu**

(Issued on the behalf of Editorial Board CSI Communications)

Dr. S S Agrawal
Chief Editor



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CSI-Bihar State Student Convention Nataji Subhas Institute of Technology, Bihta, Patna



March 20th, 2018, Computer Society of India Netaji Subhas Institute of Technology, Bihta, Patna- CSI student branch has organized the state level student convention for Bihar state at its campus. Prof. (Dr.) A. K. Nayak inaugurated the convention as the chief guest. Others present on the occasion were Mr. D. P. Sinha, RVP, Region-II as the guest of honor, Mr. Shams Raza, Ex- State Student Coordinator.

The function was started by lighting of the lamp by the dignitaries present. Registrar, NSIT introduced the institute. He also outlined the brief history and achievements of the institute. The guests were welcomed by the NSIT Principal, Dr. Sushil Kumar by presenting bouquets. Mr. Gopal Krishna, Asst Prof NSIT, introduced the event as student branch coordinator. Prof. M. P. Tripathi, member of board of governors, NSIT proposed vote of thanks. Ms. Puja Bharti and Ms. Bipra, students of CSE- 3rd Year were the anchors of the inaugural session.

Various student activities as inter college competitions were organized in this convention such as paper presentation, poster presentation, quiz, mobile app development, web development and code race. 400 students and 30 delegates from more than 20 colleges of Bihar state participated in the convention. The topic for paper presentation was "Social Computing: Opportunities & Challenges" and "Internet of Things". The topic for poster presentation was "Cashless Economy for New India". Quiz was based on ICT. Winners

of inter college competitions were awarded by trophies, certificates and cash money prize. Shubham and Anubhav of NSIT, Bihta were the winners in the quiz competition. Smriti and Vinit of IGNOU were the winners of paper presentation. Ayush Gupta and Rajiv Kumar of St. Xavier's institute of management & technology were the winners of poster presentation. Anand Sankritya and Amit Kant Verma of NSIT, Bihta were the winners of mobile app development. Anand Prakash and Amrita Pritam of IGNOU were the winners of web development. Komal and Soni of IGNOU were the winners of code race. Student participated in the event were presented participation certificates. Cultural programs were also conducted by the students of NSIT at the valedictory session.

Dr. Sushil Kumar presented the guests institute mementoes and shawl. Mr. Amrutanshu Panigrahi, HoD, CSE, NSIT proposed vote of thanks. All the faculties of CSE, ECE and EEE actively participated to make this function a grand success. Few notable among them are Mr. Aditya Shekhar, TPO, NSIT, Mr. Rajani Ranjan, HoD, ECE, Dr. Jyotiymayee Dalei, HoD, EEE, Mr. R K Chaudhary, HoD, ME, Mr. Akash Singh, HoD, CE, Mr. S C Pandit, Mr. Pradeep Kumar, Mr. Triloki Nath, Mr. Hareram Ray, Md. Mohtab Alam, Mr. Arun Kumar Singh, Ms. Preyashi Singh, Dr. Reema Dhar, Mrs. Swastika, Mr. Hasmat Ali, Mr. Kundan Singh, Mr. Ashish Kumar, Mr. Anuj Kumar Tiwari and Ms. Surbhi Priya.

CHENNAI CHAPTER



Chennai Chapter conducted the Expert Lecture program on “Digital Transformation in a Telecom Company for Enhancing Employee Experience” held at the Anna University Alumni Centre’s seminar hall on 24th January 2018. Mr. Sudeesh of Verizon data Services private Limited said in his talk that ‘Transformation’ is fundamentally about change, and organisational change is the foundation of digital business transformation. He said that organisational change, related to people, processes, strategies, structures, and competitive dynamics, is where most of the challenges and opportunities reside. He explained about the way they are going about transforming their employee’s experience by developing more and more digital transformations for them. The presentation covered the various digital transformation efforts to make employee digitally enabled to perform his job effortlessly so as to improve his experience and satisfaction. Mr. Sudeesh also spoke about their analytics team that works in identifying the key challenges which employees face by adopting purely a scientific approach and thus come up with various digital solutions to solve their problems.



The Chapter conducted the expert lecture program on “Smart Mobility as key enabler for the Smart City” on 16th February 2018. The presentation was by Mr. Satya Narayanan (Ford-Chennai). Mr. Sathya Narayanan covered the topic “Smart Mobility as key enabler for the Smart City”. In this talk, he touched upon, what is Smart City, basic needs of Smart city, how Smart Mobility is key for a Smart City and technologies that will enable to make it happen. Mr. Satya Narayanan spoke on foundational architecture of IoT and role of IoT in the scheme of ‘Smart Cities’. It was a very interactive presentation and members present raised no. of queries as the talk progressed.

COIMBATORE CHAPTER



The Chapter organized a Research Discussion followed with the Monthly Meeting on 1st February 2018. Mr. Vishnu Potty, Immediate Past Chairman welcomed the gathering. Prof. Vishwanath Kallimani, former professor in Nottingham – an Academician, Engineer and Consultant was the keynote speaker. He discussed different sources of energy, water scarcity and large-scale remedies, Green Computing. He also included how the emission of Co2 gas was affecting us and suggested using a recently developed ideology, Green Architecture which could prevent the upcoming war on water and other energy sources. A green data center is a repository for the storage, management, and dissemination of data in which the mechanical, lighting, electrical and computer systems are designed for maximum energy efficiency and minimum environmental impact. He also highlighted on the construction and operation of a green data center. The various research challenges on Data Science were presented by Dr. Ian Tan Kim Teck. Data Science is an extremely important field and concepts that are becoming increasingly critical. The world has never collected or stored as much data, and as fast as it does today. In addition, the variety and volume of data is growing at an alarming rate. Dr. G Radhamani, Secretary thanked all the members. More than 50 members from various colleges and industry attended the programme.

DELHI CHAPTER

Delhi Chapter and Jagan Institute of Management Studies organized a Panel Discussion on “Opportunities for Newbies in the Ecosystem of Digitalization” and annual Inter-College IT Quiz at JIMS Rohini Campus on 1st February 2018. This event was supported by Ministry of Electronics and Information Technology, Government of India. Aim of the panel discussion was to provide a platform to our students interested in entrepreneurship, where they can interact with young entrepreneurs and understand the challenges they can face while starting a new venture. Mr. R K Vyas, Past Hon Treasurer, Mr. Manoj Sethi, Chairman, CSI Delhi Chapter from CSI were present to grace the occasion. Chief Guest of the session was Dr. B K Murthy, Senior Director

and Scientist-G in Ministry of Electronics and Information Technology, who in his address, highlighted about the growth of IT industry in India and role of government policy makers in rising technology world. Panellist for the panel discussion were young entrepreneurs Dr. Anup Girdhar, Mr. Vikas Dhar and Mr. Ankur Jain. This highly interactive session was attended by members of CSI the Chapter, students from Jims and GGSIPU. Panel discussion was followed by Inter College-IT Quiz which was hosted by renowned quiz-master Mr. Ajay Poonia. Total 30 teams participated in quiz competition from 18 colleges including University of Delhi, GGSIPU, Ashoka University, DTU, IIFT and NSIT. Winners were awarded total cash prize of ₹ 30,000 along with trophies and certificates.



NOIDA CHAPTER



Noida Chapter in association with LINGAYA'S UNIVERSITY, Delhi NCR has organized an International Conference on the topic "Sustainable Computing and Advanced Artificial Intelligence Techniques (ICSCAAIT-2018)" during 24th & 25th January 2018. Prof. (Dr.) SK Kak Chief Guest (Chairman AICTE NWRO and Ex VC UPTU & CCS Univ Meerut) has addressed the delegates during the inaugural ceremony on 24th January 2018.

SIVAKASI CHAPTER

An expert lecture with hands on session on the topic "Unique features of Google's go programming language(golang)" was organized Sivakasi Chapter on 23.1.18. The lecture was delivered by Mr. N Sundareswaran, Assistant Professor/MCA , Mepco Schlenk Engineering College, Sivakasi. The practical session was enthusiastically attended by all the participants. Dr. P. Golda Jeyasheeli, Prof/CSE, Mepco Schlenk Engineering College, Sivakasi and Secretary of the CSI, Sivakasi Chapter welcomed the gathering. Dr. K Muneeswaran, Sr. Prof. & Head, Department of Computer

Science and Engineering presented the memento to the Resource Person.



The Chapter organized an expert lecture on the topic "Linguistic Computing" on 12th February 2018. The lecture was delivered by Dr. G Chandrasekaran, Sr. Prof. & Director, Department of Computer Applications, Mepco Schlenk Engineering College, Sivakasi. The session was enthusiastically received by all the participants. Dr. P. Golda Jeyasheeli, Prof/CSE, Mepco Schlenk Engineering College, Sivakasi and Secretary of the Chapter welcomed the gathering and introduced the resource person

VELLORE CHAPTER



CSI Vellore Chapter organized one day workshop on "Smart Grid Optimization, Analytics" on 19th December 2017 at VIT University. Mr. S K Halgamuge, Fellow IEEE, Chennai, explained the basics features of smart grid, how the energy production, transmission, distribution and consumption can be monitored through analytics using data mining techniques. His talk mainly focused on Analytics part of smart grid. Around 60 members participated in workshop, organized by Dr. R Rajkumar & Prof. K Govinda, Past RVP VII.

▶ FROM CHAPTERS & DIVISIONS ▶▶▶

MARCH 2018



CSI Vellore Chapter organized one day guest lecture on "The Impact of AI on Digital Transformation" on 3rd Feb 2018 at VIT University. Mr. Philip Varughese, Vice President-Cognitive Decision Systems and Data Strategy, Accenture, Bangalore, explained the basics features data, data management and how AI techniques will help in the digital transformation. Explained various techniques in AI. Around 40 members participated the guest lecture, organized by Dr. R.Rajkumar, Prof. K Govinda, Past RVP VII, Prof. H R Viswakarma.

APRIL 2018

CHANDIGARH CHAPTER



A workshop on Internet of things was organized at CDAC Mohali to mark the foundation day of Computer Society of India by the Chandigarh Chapter on 7th March 2018. There were 26 student participants from 4 different institutes with their respective faculty coordinators. Mr. S C Jain, Chairman CSI Chandigarh Chapter welcomed and briefly described the activities of CSI. Dr. Sanjay Sood, Joint Director CDAC Mohali and State Student Coordinator CSI for Punjab gave an overview and applications of Internet of Things. Mr. D S Chhabra, former Chairman CSI Chandigarh Chapter, Faculty and students were present. The workshop began with a short lecture on the basics of Internet of Things. Then, a hands-on session on Texas Instruments CC3200 Wifi-certified kits for implementing simple 'IoT Based Application' was conducted.

COIMBATORE CHAPTER



Coimbatore Chapter organized a Seminar on Managing Energy, Computationally by Dr. Krithi Ramamritham, Professor, CSE, IIT, Mumbai and a discussion on Problem

Solving through Hands and Learning by Dr. Saraswathi on 20th February 2018. Mr. N Valliappan, Chairman CSI Coimbatore Chapter welcomed the gathering. Prof Krithi presented a Computational perspective to smart energy management, with an emphasis on smart buildings and smart electric grids. He has also highlighted on the use of data driven approaches, and techniques such as inferencing and learning, focusing specifically on improving energy efficiency. Dr. Krithi also showed a demo on the smart classrooms which they have implemented in the Indian Institute of Technology, Bombay, (IIT-B). Dr. Saraswathi addressed the question of how do we get our college students to be creative in leading them to be innovators and entrepreneurs. She has also presented the Robotics and embedded systems competitions conducted by e-Yantra project to trigger the creativity in students through hands on Project Based Learning (PBL). They also addressed on how scalable and sustainable ecosystems can be built in colleges across the country to nurture such hands-on learning.



The Chapter also conducted the Annual General Meeting (AGM) on 22nd February 2018. Mr. Valliappan, Chairman, CSI Coimbatore Chapter opened the meeting and welcomed all members for participation. Mr. S Vishnu Potty, Past Chairman presented the financial statements for the year 2016-17. He also highlighted the income generated compared to the last year, and it was well appreciated by all the members. Mr. N Duraiswamy, Chapter Treasurer, updated the participants on Chapter's income and expenditure details and explained the total assets and liabilities position. After detailed review

and discussion, the financial statements as presented was proposed for adoption by Dr. K Sabapathy, and seconded by Prof A Sivabalan. Subsequent to financial statements review, Dr. G Radhamani, Secretary of the Chapter thanked all the members present.

PUNE CHAPTER



Pune Chapter organized CodeX 2018, a Regional coding competition, in association with Soft-Corner, Pune and Reliscore, Pune. This competition was for Undergraduate Students from Computer / IT engineering, BSc, and MCA stream. The Competition was held in three rounds. In the First-round total 200 students participated. This was an online round conducted on 12th Feb 2018. Students solved the problems and wrote code on Reliscore web portal. Out of these 200 students 16 students were chosen for Second-round. This was an interview round through Skype and conducted by Soft-Corner team on 14th February 2018. Third and final round was conducted at MIT, Pune on 17th February 2018. Total 8 students were selected for this round. This was supervised online coding round. Final 3 winners declared and given cash prizes along with trophy and certificates. Chief Guest for final round was Mr. Ravindra Damle, CEO, Soft-Corner, Pune. The event was coordinated by Mr. Vasant Sathe, Mrs. Pradnya Kulkarni and Mr. Abhishek Agrawal.

VELLORE CHAPTER



On 16th to 18th March 2018, CSI Vellore Chapter and Student Branch in association with CSI Division II organized their flagship event - DevSpace, a thirty-hour long Hackathon. The total participants for the event was 750, including 150

external participants from other universities in Tamil Nadu, Kerala, A.P and Telangana, the theme of the hackathon was on different verticals like Blockchain, Cyber Security, Cloud Computing and Social Computing. On 16th there is exclusive talks from Amazon, BOSCH, Byte Code and KrypC. The event was held under the guidance and support of Dr. Govinda K, Mr. Sendhil Kumar, SBC & Mr. R Rajkumar, Chairman.

VISAKHAPATNAM CHAPTER



Under the chairmanship of Shri Prabir Raychaudhury, Director (Commercial), RINL, IMPACT 2018, a National Conference on Internet of Things, Machine Learning, Predictive analytics, Artificial Intelligence and other Computing Trends was organized by Visakhapatnam Chapter in association with Visakhapatnam Steel Plant, RINL on 5-6 January 2018. As the disruptive technologies are all set to transform business, global economy and lives, CSI, Vizag organised this Conference to bring together researchers, engineers, developers and practitioners from Academia, Industry, Government Organisations, NGOs and MNCs to disseminate their knowledge, share their experiences and exchange ideas about the latest development and trends of the entire disruptive eco-system to find out how these disruptive technologies are changing the society in general and the industries in particular. CEOs, CIOs, IT Professionals, IT enthusiasts, IT End-users, Researchers, Academicians, Students and CSI members participated in the Conference as delegates and authors. Manufacturers and Start-ups also participated in the Conference to present and exhibit their products and services. The conference with the contemporary theme evoked very positive response among the IT circuit. 230 delegates from Industry and Academia from various parts of the country converged to the conference and listened to lectures of 22 eminent speakers who are experts in their domain.

The Chapter conducted the 4th edition of the prestigious Quiz Contest, "WIZKID 2018" on 20th February 2018 for the school children of Class VIII to X. There was a huge response from the student fraternity. 441 students in 147 teams comprising of 3 students each from 37 schools participated in the Quiz. Sri. Prabir Raychaudhury, Director (Commercial), RINL and Chairman, CSI, Visakhapatnam Chapter inaugurated the program in the presence of Sri. KVSS Rajeswara Rao, GM (IT & ERP), Vizag Steel and Sri. Suman Das, HOD (IIT), Vizag

▶ FROM CHAPTERS & DIVISIONS ▶▶▶

APRIL 2018

Steel. Sri. P Balaramu, AGM (IT), Vizag Steel and Treasurer, CSI, Visakhapatnam Chapter, welcomed the participants. Sri. Sudhansu Sekhar Choudhary, AGM (IT), Visakhapatnam Steel plant and National Champion of various major Quiz contests was the Quiz master. The Quiz was conducted in three challenging phases. The finalists qualified through a tough written Elimination round and a gruelling Semi-final. The Final was sensational and nail-biting. The team from Delhi Public School, Ukkungaram emerged as winner and bagged cash prize of ₹ 15,000, the 1st runner up was from Navy Children School, Nausena Bagh and the 2nd runner up was also from Delhi Public School, Ukkungaram who received ₹ 9,000 and ₹ 6,000 as cash prizes respectively other than the Individual and School Trophies. Participation certificates were issued to all the participant students in the Quiz and Medals to the finalists.



UDAIPUR CHAPTER



In the backdrop of contemporary need of the hour, the International Seminar & Panel Discussion on Cyber Crime

& Cyber Security C3S-2018 is organized by Department of Computer Science & Engineering at S S College of Engineering in association with CSI Udaipur Chapter. This seminar turned into a milestone as witnessing the congenial presence of the luminaries of international fame. The conference is itself honored by presence of Prof. Dharm Singh, Namibia University of Science & Technology, Namibia; Mr. Brijesh Soni, Additional Superintendent of Police, Udaipur; Mr. Prince Boonlia, Founder Director, Council of Information Security, Delhi; Dr. Poonam Dhaka, University of Namibia, Namibia; Dr. Bharat Singh Deora, Secretary, CSI Udaipur Chapter. Dr. Bharat Singh Deora given a brief of CSI and its activities and motivate the faculties and students to join CSI. The Chief Guest Prof. Dharm Singh has honoured the Institute and the participants with his unparalleled knowledge on the sub tracks like, Cyber Security and technology which are less vulnerable from attacks like cloud computing, Fog Computing and Roof Computing etc. Being the Guest of honour, Mr. Brijesh Soni, has expressed his line of thinking in various areas including Cyber Crime Cases reported and investigated by Udaipur police. He also advised the students to use internet social networking sites carefully and wisely. He also shared real cases of forgery and cheating committed by cyber criminals by internet. As a keynote speaker, Dr. Poonam Dhaka has thrown light on culture of living in joint family in Indian Society and compared it with nuclear family culture of other countries. Being a psychologist, she pointed on nuclear family culture as the biggest reason behind the cyber related crimes. Lastly, Mr. Prince Boonlia has shared with participants his real experience with live backdrop of current happenings in the society in the area of Cyber Crime. He has also signified the utility of the subject under the panel discussion for the betterment of society and social life. Momentous were presented to all the guests as token of thanks by Principal Dr. Prashant Sharma & Dean Dr. Pranay Joshi. In Vote of Thanks, Mr. Dipesh Vaya, Head, CSE, has thanked Dr. Bharat Singh Deora for his support and associating CSI with this event. He further added that the participants have reaped the fruit of the enriched knowledge and vast experience shared during the program for their technical enhancement.

▶ CSI CALENDAR 2017-18 ▶▶▶



Gautam Mahapatra, Vice President, CSI, Email: vp@csi-india.org

Date	Event Details & Contact Information
APRIL 21, 2018	National IT Convention on "Emerging Cyber Security Threats, Challenges & Opportunities" in association with Computer Society of India (CSI) Ghaziabad Chapter & Dr. APJ Abdul Kalam Technical University, Lucknow. Website : www.its.edu.in

REGION-I

Guru Tegh Bahadur Institute of Technology, New Delhi



1-2-2018 & 2-2-2018 – Event on CSI CANNON 2018

Sunder Deep Group of Institutions, Ghaziabad



17-2-2018 - National seminar on Role of Technology in Bridging the Gap between Academia & Industry

REGION-III

Sarvajanik College of Engineering & Technology, Surat



15-2-2018 - Expert Talk on Internet of Things

Sagar Institute of Research & Technology, Bhopal



5-2-2018 to 12-2-2018 - Short term training Program on Java and Android Application Development

G H Patel College of Engg. & Tech., Vallabh Vidyanagar



12-3-2018 - Workshop on Augmented and Virtual Reality

The LNM Institute of Information Technology, Jaipur



7-3-2018 & 8-3-2018 - Introductory Session to Microsoft Imagine Cup & Hands-on Session with Microsoft Azure

REGION-IV

CMR Technical Campus, Hyderabad



16-2-2018 & 17-2-2018 – Prof. Kar, Prof. Talukdar, Prof. Misra & Prof. Baral during Inauguration of Annual Inter College Technical Festival (NOESIS)

REGION-V



8-3-2018 - International Women's Day Celebrations

▶ FROM STUDENT BRANCHES ▶▶▶

REGION-V

Guru Tegh Bahadur Institute of Technology, New Delhi



19-2-2018 to 21-2-2018 - Workshop on Progressive Web App Development using React JS and Bootstrap-4

Sunder Deep Group of Institutions, Ghaziabad



14-3-2018 - Hands-on Session on IIITH Virtual Labs by Dr. Ravi Shankar

REGION-V

GITAM Institute of Technology, Visakhapatnam



3-3-2018 – Event on Alibaba Cloud Most Valuable Professional (MVP) Tech Show



5-3-2018 & 6-3-2018 - Two-day Annual Fest on Ethereal 2K18

Santhiram Engineering College, Nandyal



21-2-2018, 22-2-2018 & 5-3-2018 - Workshop on Block Chain Technology



9-3-2018 - Program on Internal PPT

Aditya Engineering College, Surampalem



15-2-2018 to 17-2-2018 - Workshop on Full Stack Web Development Mr. Raviteja and Mr. Hemanth



21-2-2018 & 22-2-2018 - Workshop on Block Chain Technology Hackathon by Mr. Prashanth

▶ FROM STUDENT BRANCHES ▶▶▶

REGION-V

NBKR Institute of Science and Technology, Nellore



28-2-2018 - Video Contest on Awareness on Social Responsibilities



16-3-2018 - Workshop on Weka (Machine Learning)

R V College of Engineering, Bangalore



23-2-2018 & 24-2-2018 - Workshop on Virtual Reality and Augmented Reality



10-3-2018 - Orientation on NBA & OBE Process

REVA University, Bangalore



28-2-2018 - Presented foldable wheel Chairs at Advantage Elder Care Home as part of Social Responsibility outreach program

K.S. Institute of Technology, Bangalore



17-2-2018 - Technical talk on Fourth Generation Technologies by Dr Prakash, Past Chapter Chairman & Editor CSI Adhyayan

Maharaja Institute of Technology, Mandya



20-2-2018 - Technical Talk on Computer Vision and Applications by Dr Chandrajith



9-3-2018 & 10-3-2018 - Workshop on Ethical Hacking by Mr. Samarth B Bhat

▶ FROM STUDENT BRANCHES ▶▶▶

REGION-V

NMAM Institute of Technology, NITTE



10-3-2018 - Inter-College Paper Presentation



10-3-2018 - Android Workshop

K L E College of Engineering and Technology, Chikodi

Anurag Group of Institutions, Hyderabad



10-3-2018 - National Conference ACSET (Advances in Computer Science Engineering & Technology)



2-3-2018 - Motivation talk on Confidence Building and Personality Development

Narayana Engineering College, Nellore



8-2-2018 to 14-2-2018 - Faculty Development Program on Python Programming



17-3-2018 - One Day National Level Technical Symposium on Arohan 2018

Bharat Institute of Engineering and Technology, Hyderabad



20-2-2018 to 21-2-2018 - International Workshop on System Engineering & Technology



27-2-2018 & 28-2-2018 - Workshop on IBM CLOUD AND WATSON IOT

► FROM STUDENT BRANCHES ►►►

REGION-V

Lakireddy Bali Reddy College of Engineering, Mylavaram



17-3-2018 - Guest Lecture on Enhancing Problem Solving Skills by Dr Babu Reddy

G Narayanamma Institute of Tech. and Sc., Hyderabad



3-3-2018 - Winners of Open Innovation Contest

REGION-VI

Maharashtra Institute of Technology, Pune



28-2-2018 - Event on Placement Mantra' 18

Guru Gobind Singh Polytechnic, Nashik



28-2-2018 - State Level Technical Event on TECHNOBRAIN -2k18

K K Wagh Institute of Engg. Education & Research, Nashik



16-3-2018 - Mr. Tanmay S. Dixit delivering Expert Talk on Cryptography and its Applications

Mukesh Patel School of Tech. Mgmt. & Engg., Shirpur



16-2-2018 to 18-2-2018 - Technical festival AMBIORA'18

Marathwada Institute of Technology, Aurangabad



16-2-2018 & 17-2-2018 - Symposium CYBERNETICS 2018



3-3-2018 to 5-3-2018 - Workshop on IoT

▶ FROM STUDENT BRANCHES ▶▶▶

REGION-VI

Universal College of Engineering, Vasai



2-2-2018 - Mr. Suresh Shan addressing during Intercollegiate Project Competition on Smart City



17-3-2018 - Seminar on Practical Approach towards Computer Networks by Mr. Kalpesh Vartak & Mr. Saurabh Matre

REGION-VI

Prof. Ram Meghe Inst. of Technology & Research, Amravati



10-2-2018 – Event on National Inventor's Day

REGION-VII

Kongu Engineering College, Perundurai



17-2-2018 – Event on ENVISTAS 18

REGION-VII

Kongu Engineering College, Perundurai



3-3-2018 – Workshop on Amazon Web Services by Dr. Kousalya & Mr Venkatasubramaniam

Valliammai Engineering College, Kattankulathur



7-3-2018 - Technical Seminar on Bioinformatics

Valliammai Engineering College, Kattankulathur



8-3-2018 Workshop on Drafting for Patent Filing

SVS College of Engineering, Coimbatore



22-2-2018 - Workshop on Client Server Communication in LINUX Environment

▶ FROM STUDENT BRANCHES ▶▶▶

REGION-VII

Jeppiaar Engineering College, Chennai



29-1-2018 - Mr. Raj delivering Guest Lecture on CAREER OPTIONS & YOU

Dr. M G R Educational and Research Inst. University, Chennai



9-2-2018 - Technical Talk on Logic of Programming using Python

Dr. M G R Educational and Research Inst. University, Chennai



28-2-2018 - Technical Talk on Blockchain Technology and Crypto Currencies

Rajalakshmi Engineering College (Autonomous), Chennai



3-3-2018 - Hands-on Session Incident Response & Disk Encryption Forensics

Rajalakshmi Engineering College (Autonomous), Chennai



3-3-2018 - Workshop on Cyber Security

Panimalar Institute of Technology, Chennai



16-2-2018 - Guest Lecture on Breathing Technology in Young Minds Robotics

Panimalar Institute of Technology, Chennai



21-2-2018 - National Level Technical Symposium - Techkranthi-2018

Syed Ammal Engineering College, Ramanathapuram



24-2-2018 - TECHCON'18 student level technical convention

REGION-VII

National Engineering College, Kovilpatti



15 & 16-2-2017- Release of Souvenir by Prof. Prashant R Nair, Editor CSIC during National Level Technical Symposium

IFET College of Engineering, Villupuram



3-2-2018 - Project Expo Ekspozite '18

IFET College of Engineering, Villupuram



16-2-2018 - Internal symposium

PSGR Krishanammal College for Women, Coimbatore



22-1-2018 & 23-1-2018 - National Workshop on Predictive Analytics of Environmental Changes in Remote Sensing

Jeppiaar Institute of Technology, Sriperumpudur



9-2-2018 - National Level Technical Symposium on Techisetz '18

EASA College of Engineering and Technology, Coimbatore



9-3-2018 - Dr. Sundaresan, RVP-3 inaugurated the CSI Student Branch

Einstein College of Engineering, Tirunelveli



22-3-2018 - Students with their poster presentation on the theme IOT during Technical Quiz

Adhiyamaan College of Engineering, Hosur



14-3-2018 & 15-3-2018 - Fifth National Conference on Trends in Advanced Computing and Applicationst

▶ FROM STUDENT BRANCHES ▶▶▶

REGION-VII

S A Engineering College, Chennai



6-3-2018 - Technical Programme during CSI Foundation Day

JCT College of Engineering and Technology, Coimbatore



9 & 10-3-2018 - Workshop on Mobile Application Development

K L N College of Engineering, Pottapalayam



27-1-2018 - Guest Lecture on IoT and its Applications

K S Rangasamy College of Technology, Tiruchengode



23-2-2018 - National Level Technical Workshop on Big Data Analytics

Amrita School of Arts & Sciences, Kochi



14-3-2018 & 15-3-2018 - Two day National Workshop on Web Design Framework Django

Priyadarshini Engineering College, Vaniyambadi



14-3-2018 - Hands-on Training Data Analytics using Hadoop

Sethu Institute of Technology, Kariapatti



8-3-2018 & 9-3-2018 - National level Techfest on Tech Tonics 2k18

Student branches are requested to send their report to sb-activities@csi-india.org

with a copy to adm.officer@csi-india.org

Chapters are requested to send their activity report to chapter-activities@csi-india.org

with a copy to adm.officer@csi-india.org

Kindly send **High Resolution Photograph** with the report.

