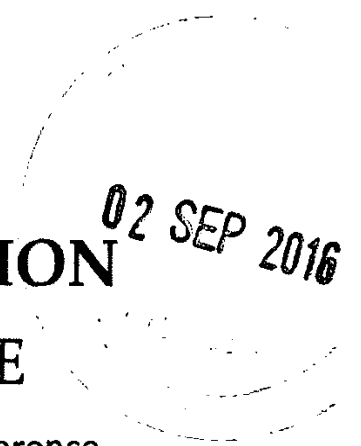


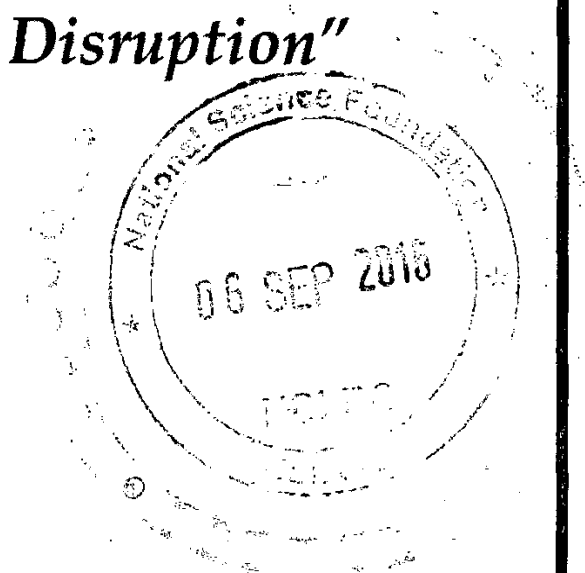
PROCEEDINGS OF
THE 34th NATIONAL INFORMATION
TECHNOLOGY CONFERENCE

The Annual Industry-focused International Standard ICT Conference

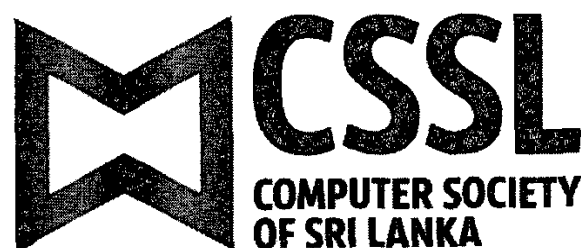


"Enhancing Sri Lanka Through Digital Disruption"

8th to 10th of August 2016
Galadari Hotel
Colombo, Sri Lanka



Organised by



Disclaimer

The views expressed in the papers published in these proceedings are those of the authors. The statement and opinions stated either in the papers published herein or at the conference and discussions do not necessarily represent the views of the Computer Society of Sri Lanka.

Proceedings of the National Information Technology Conference

A publication of the Computer Society of Sri Lanka.

ISSN 2279-3895

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Dr. Dinesh Arunathilaka	IBM World Trade Corporation, Sri Lanka
Mr. Chandana Weerasinghe	DMS Software Technologies (Pvt) Ltd, Sri Lanka

34th NATIONAL INFORMATION TECHNOLOGY CONFERENCE NITC 2016

INAUGURATION AGENDA

8TH August 2016

Galadari Hotel, Colombo, Sri Lanka

- | | |
|--------|--|
| 5.30pm | Arrival of Guests |
| 5.55pm | Arrival of Chief Guest & Guests of Honor |
| 6.00pm | National Anthem |
| 6.05pm | Lighting of the Ceremonial Oil Lamp |
| 6.15pm | Welcome address by Dr. Dayan Rajapakse, President of CSSL |
| 6.35pm | Keynote Speech by Ms. Michelle Beveridge – Chief Information Officer
of Intrepid Group |
| 6.55pm | Awarding CSSL honorary Fellow Membership |
| 7.10pm | ICT Awards 2016 |
| 7.40pm | Recognition of Sponsors |
| 7.50pm | Address by the Chief Guest, Hon. Ranil Wickramasinghe,
The Prime Minister of the Democratic Socialist Republic of Sri Lanka |
| 8.10pm | Vote of Thanks by Mr. Yasas V Abeywickrama, Conference Manager / Vice
President of the CSSL |
| 8.35pm | Fellowship & Cocktail |

34th NATIONAL INFORMATION TECHNOLOGY CONFERENCE NITC 2016

DAY 1 – 9TH AUGUST – CONFERENCE AGENDA

8:30AM - 9:00AM	Registration	
	Common Session	
	<i>Session chair: Mr Niranjan De Silva - Former Director and CEO of Metropolitan Computers.</i>	
9:00AM - 9:40AM	Hon. Prof. Ashu Marasinghe (M.P.)	
9:40AM - 10:20AM	Ms. Michelle Beveridge - "Leveraging Cloud"	
10:20AM - 10:30AM	Q&A	
10:30AM - 10:45AM	Morning Tea	
	<i>Session chair: Mr Mano Sekaran - Chairman, SLASSCOM</i>	
10.45AM - 11.25AM	Mr Supun Weerasinghe - "Affordable Internet as a catalyst for broadband adoption and economic growth"	
11.25AM - 11.50AM	Prof. Mohan Munasinghe - "Enhancing sustainable development in Sri Lanka - A key role for ICT"	
11.50AM - 12.15PM	Professor Lalith Gamage - "Evolutionary Computing for Industrial Automation"	
12.15PM - 12.25PM	Q&A	
12.25PM - 1.25PM	Lunch	
	Parallel Sessions	
	Leveraging Cloud	Quality Assurance
	<i>Session chair: Mr Ruwan Amarasekera -</i>	<i>Session Chair: Mr Wasantha Weerakoon - President, FITIS</i>
1.25PM - 2.05PM	Prof. Dr. Dimiter Velev - "Digital Disruption taking place due to Cloud computing"	Ms. Chinthi Weerasinghe - "Reimagining quality in a highly dynamic and agile environment, focused on driving a richer customer experience through digital disruption"
2.05PM - 2.30PM	Mr Chandika Jayasundara - "Consumerization of Enterprise Software. Riding the next wave"	Mr Chamil Kirieldeniyage - "Developer's QA Toolkit"
2.30PM - 2.55PM	Dr Lalith Liyanage - "How Active Student Engagement can make Learning Effective"	Ms Asanthika Imbulpitiya - "Test Automation Frameworks for Handling Requirement Changes In Web Applications"
2.55PM - 3.05PM	Q&A	Q&A
3.05PM - 3.20PM	Afternoon Tea	
	IOT	Open source
	<i>Session chair: Dr Malitha Wijesundera</i>	<i>Session chair : Mr Chandana Weerasinghe</i>
3.20PM - 4.00PM	Mr Asanga Abeygoonasekara - "Digital Disruption to fight Corruption: I paid a bribe"	Dr. Srinath Perera - "What can opensource and open data do for Sri Lanka?"
4.00PM - 4.25PM	Mr Sajeewan Sachiththanandan - "IOT in real Life"	Dr. Rashed Mustafa - "Current Trends and Research Challenges of Multimedia Cloud Computing with Open Source technologies"
4.25PM - 4.50PM	Dr. Kuntal Patel - "Critical Study and Analysis of Usefulness of Massive Open Online Courses "	Mr U Sajeew - "Open Source Mobile Network"
4.50PM - 5.00PM	Q&A	Q&A
5.00PM - 5.10PM	Raffle Draw	

34th NATIONAL INFORMATION TECHNOLOGY CONFERENCE NITC 2016

DAY 2 – 10TH AUGUST – CONFERENCE AGENDA

8:30AM - 9:00AM	Registration	
	Common Session	
	<i>Session chair: Dr Dayan Rajapakse - President CSSL & Chairman / M.D. of ESOF Metro Campus</i>	
9:00AM - 9:40AM	Mr. Kumaran Singaram - "Leveraging Cloud"	
9:40AM - 10:20AM	Ms. Mehrnoush Salehpour - 'Digital Disruption and User Experience'	
10:20AM - 10:30AM	Q&A	
10:30AM - 10:45AM	Morning Tea	
	<i>Session Chair: Mr Dinesh Sattrukulasinghe</i>	
10.45AM - 11.25AM	Dr. Anirban Basu - "IoT, Big Data and Analytics"	
11.25AM - 11.50AM	Prof. Abhaya Induruwa - "Internet: Next wave of Disruption - Opportunities and Threats"	
11.50AM - 12.15PM	Mr. Saman Perera - "Digital Value Fabric: The Cornerstone of Digital Business"	
12.15PM - 12.25PM	Q&A	
12.25PM - 1.25PM	Lunch	
	Parallel Sessions	
	Healthcare ICT	Smart Payments
	<i>Session chair: Mr Rasantha Hettithanthrige</i>	<i>Session chair : Mr Luxaman Perera - Head of IT</i>
1.25PM - 2.05PM	Prof Vajira Dissanayake - 'Digital Health: The Health Care of the Future'. ☒	Mr Varuna Jayalath - Data "Life", Protection and Continuation
2.05PM - 2.30PM	Dr Chamidu Atupelage - "Computer Vision for Biomedical Informatics"	Mr Dhanika Perera - "Digital Payments for a Smart Future"
2.30PM - 2.55PM	Mr Lakmal Vithanage - "Effective Solution for Multi-Disciplinary Management of Cleft Lip and Palate"	Ms Thilini Weerasooriya - "Solving Sinhala Language Arithmetic Problems using Neural Network"
2.55PM - 3.05PM	Q&A	Q&A
3.05PM - 3.20PM	Afternoon Tea	
	Safety & Security	Affordable Internet
	<i>Session chair: Ms Vishaka Nanayakkara - Deputy Project Director /HETC Project and Senior Lecturer - University of Moratuwa</i>	<i>Session chair: Prof Gihan Dias - Professor - University of Moratuwa - Domain Registrar - LK Domain Registry</i>
3.20PM - 4.00PM	Professor Bipin Mehta - " Societal Impact of Digital Disruption"	Mr. Yasiru Abeygunawardana - "Affordable Internet"
4.00PM - 4.25PM	Mr. Champika Wijayatunga - "Internet Identifier Systems Security and Abuse Handling"	Mr Isuru Samarage - "From Disruption to Sustainable Growth"
4.25PM - 4.50PM	Mr. Lahiru Amalka N Yapa - "Real Time Road sign detection using hybrid colour segmnetation and invairant shape detection"	Mr Tharanga Nandika Silva - "A connectivity sub-system to Enhance existence of Internet of Things in Remote Areas of Sri Lanka by using Wireless Communication interface"
4.50PM - 5.00PM	Q&A	Q&A
5.00PM - 5.10PM	Raffle Draw	



**MESSAGE FROM THE PRESIDENT OF
THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA**

The Computer Society of Sri Lanka, established in 1976, has been performing a yeoman service for the ICT industry, and I consider it to be an honour bestowed upon me, to pen a message on the occasion of the inauguration of the 34th National Information Technology Conference of Sri Lanka.

The CSSL has a diverse membership consisting of students, fresh graduates who make up the associate membership, as well as seasoned industry professionals who make up the professional membership. As such, it is heartening to see that they organize this event of national importance, to bring together the learning community, the academic community, the professional community, as well as decision makers in the ICT industry.

My policy has been to develop the national economy by emphasizing the importance of a development economy where small, medium, and large scale projects need to be launched, and I am fully aware that ICT will play a major role not only in the projects themselves but also in stimulating the economy by becoming a major foreign income earner for Sri Lanka. In order to generate employment opportunities and self-employment opportunities, one of the best sectors would be the ICT sector, and my government has clearly understood this.

Telecommunication and digital infrastructure has been identified as two of the key areas that would define the future of the nation. My government has formed a ministry for this area specifically and it is in the process of setting up future plans regarding telecommunication and digital infrastructure of the country.

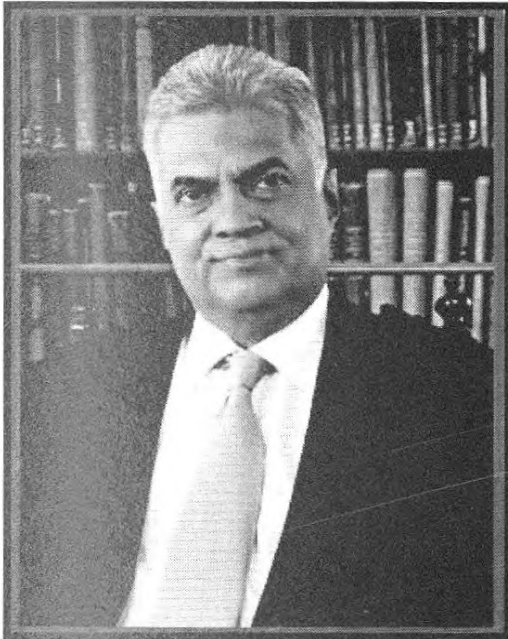
People must have the right and the ability to access information at the right time. My government is taking measures to put the legislation and processes in place for this.

The work of the CSSL must also be appreciated, and I believe that the Government and the CSSL can work hand in hand in achieving our goals. The young generation will carry us forward and ensure our legacy, only if we invest in their future. As such, projects such as the National Schools' Software Competition are truly commendable, for generating an active interest in ICT among the school goers.

I would like to congratulate the CSSL for all of their accomplishments, and wish for a productive National IT Conference where intellectuals and professionals will engage in discussing the latest technologies and concepts, and hopefully see about how these can be used for the betterment of our Nation.

Maithripala Sirisena

HIS EXCELLENCY THE PRESIDENT



**MESSAGE FROM THE PRIME MINISTER OF
THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA**

It is a pleasure to give this message as well as participate as the Chief Guest of the 34th National Information Technology Conference of Sri Lanka organized by The Computer Society of Sri Lanka.

ICT industry as well as CSSL are close to my heart as I have been involved in supporting the growth of the local ICT industry from its early days during my long political career.

The CSSL is the recognized professional association in the Information and Communications Technology industry, hence my government will continue to work with you in terms developing the industry and support you in your various valuable national endeavors. I strongly believe professionalism is important in any sector and the work you do to uplift that in your sector is phenomenal.

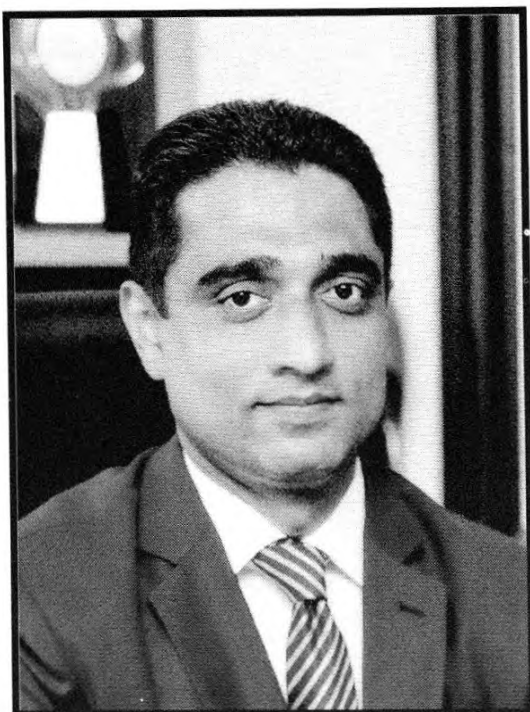
My vision is to build a digitally empowered nation. For that, we have formed a ministry for the first time in the history as well. Improving the digital infrastructure of Sri Lanka for facilitating the enhancement of digital ecosystems, utilizing the ICT for improving the governance and enhance the ICT policies, legislations and standards, are some of the key objectives of my government and I want the support of the ICT professionals in achieving those.

We are also working to make the Sri Lankan economy a globally connected one, and in that ICT plays a crucial role. I also believe that ICT can enable many other areas, changing the way people do things and making things easier and transparent. As we develop a less corrupt country, your contribution in that in terms of technology will be very important. Disrupting the society in a positive manner is what ICT can do and has done in many areas of the society. I hope your discussions at this conference will help us disrupt our society to make it better, and eventually help the people of this country.

I would like to congratulate the CSSL for all of their accomplishments, and wish for a successful National IT Conference. I hope the deliberations of it would add value to our country.

Ranil Wickramasinghe

HONOURABLE PRIME MINISTER



MESSAGE FROM THE PRESIDENT OF CSSL

It is my pleasure to welcome you to the 34th National Information Technology Conference (NITC), the flagship event organised by the Computer Society of Sri Lanka (CSSL) since 1982.

The theme of this year's conference is very timely at this juncture since it is becoming ever more apparent that IT is the catalyst which can take our country forward. Around the world, technology-driven organisations are causing disruption by growing fast, discovering new markets and boldly re-imagining the way we all do business. This should serve as an eye opener for countries such as Sri Lanka which are still lagging behind in terms of economic development. This conference will include discussions on the use of IT for innovation and differentiation with a special emphasis on how to use technology to actively contribute to and drive the economy. In my view, there are two ways to achieve this. Firstly, by injecting technology into existing businesses, industries and government bodies in order to improve existing products and services. Secondly, by using technology to tap into new, previously un-imagined markets. Thus, NITC should not be seen as an event that is solely devoted to ICT practitioners; it is an important platform where people from many different areas of business and government can come together to look for new solutions powered by IT. I am confident that any current and future entrepreneurs, professionals from other disciplines and corporate leaders would also benefit greatly from some of the ground-breaking ideas presented during this conference.

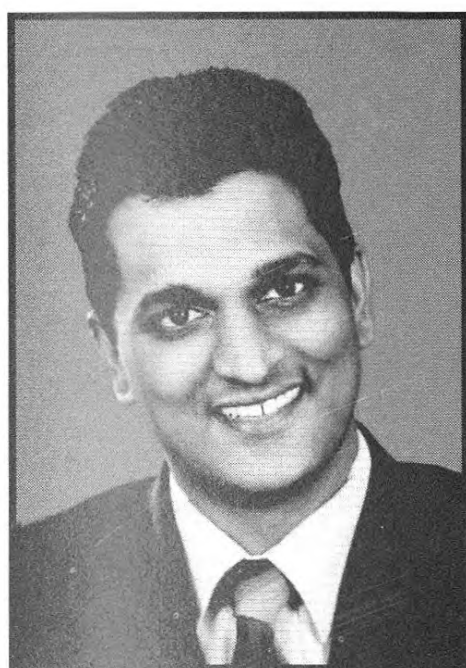
For over four decades we have been the apex professional body representing IT professionals in Sri Lanka and working to uplift their knowledge, skills and standards. CSSL focuses on three key areas: our members, the IT industry and the youth of Sri Lanka. Our prime duty is to develop our members and support their personal and professional development in order to positively impact the IT industry. We also work closely with other associations to help develop and grow the industry with a view towards achieving long term stability. By encouraging the country's youth towards IT, we hope to meet the increasing demand for ICT professionals and realise our vision of a more economically sustainable Sri Lanka.

The prevalence of brain drain is much higher in the IT field and I feel that we need to develop a more conducive environment which can retain top ICT talent in the country. Of course, matters such as salaries and benefits are up to the individual employers but as a country we need to ensure that IT professionals are also offered the status and recognition afforded to professionals in other areas including Medicine, Engineering, Accountancy etc. as it will go a long way toward recognising the value of their contributions.

Finally, I would like to thank all of you for being here and hope you will take this opportunity to share your thoughts, build new relationships and actively join the debate on how we can drive Sri Lanka's economy forward through the greater adoption of IT.

Dayan Rajapakse (Dr.)

PRESIDENT – CSSL



MESSAGE FROM THE CONFERENCE MANAGER

The National IT Conference is here for the 34th year and this year's conference promises to be a success with the distinguished panel of presenters that we have lined up and other associated activities.

It gives me immense pleasure and honour to have been able to lead and drive the organizing of National IT Conference of our country this year, with the support of many stakeholders including the guidance of the President and Executive Council of CSSL.

This year's theme was selected as a timely and relevant topic considering the disruptions that have taken place, and are yet to take place, both locally and internationally due to technology.

We have worked with local and international experts to develop a content rich conference, to discuss what ICT can offer for the society for its betterment, not just by minor improvements but through large scale disruptions. This is what that will be discussed in detail, looking at it from different perspectives at this conference. Our relationships with IFIP (International Federation for Information Processing) and SEARCC (South East Asian Regional Computer Confederation) have helped immensely in developing the conference agenda.

We have an eminent panel of experts and presenters, both local and international, to cover diverse but interacting areas of knowledge. Some of you will take this as food for thought, to be taken with a pinch of salt. For some, it will get the ball rolling in your mind as to how some of these areas can be implemented within your organization, or you may conceptualise how you may monetize some of the ideas that are presented herein. For the academically minded, the research papers that are presented here will perhaps help you focus on an area of research for yourself. Either way, there is something for everyone here.

A lot of people have put in many months of hard work, with the penultimate result being this conference. The CSSL secretariat played a key role in organizing this event, the authors and researchers submitted their papers and were then reviewed by an expert panel to determine suitability for inclusion in the proceedings, the sponsors gave us the financial support that was needed to bring everything together, speakers and presenters have set aside their valuable time to be here, and the event management and hospitality management crews have been hard at work as well, to ensure that this year's National IT Conference is the best yet.

I thank you all for participating, and hope you find the mental stimulation that you expected as a participant.

Yasas Vishuddhi Abeywickrama

CONFERENCE MANAGER -NITC 2016

VICE PRESIDENT - CSSL



**MESSAGE FROM EDITOR / CHAIRMAN
PUBLICATION COMMITTEE - NITC 2016**

I would like to extend a warm welcome to the ICT professionals and delegates on behalf of the Publication Committee, to the 34th National Information Technology Conference (NITC) - “Enhancing Sri Lanka through Digital Disruption”.

This year, the articles were mainly received on the conference main tracks; Leveraging Cloud, Quality Assurance, Internet of things (IOT), Open Source, Smart Payments, Safety & Security, Affordable Internet and Healthcare ICT. The articles that were received are based on the individual or collaborative research carried out in the industry and academia. After a careful review, 15 articles have been selected for the publication out of 112 overall submissions. This year, the review panel was specially formed with specialists in the industry and academia. To improve the quality of submissions, all the research articles were reviewed by both sectors: industry and academia. The panel considered not only the standard of the articles but also the relevance to the conference theme - Enhancing Sri Lanka through Digital Disruption.

I would like to express my considerable appreciation to all authors of the articles in this conference proceedings and all the reviewers who made a significant contribution in reviewing and providing constructive feedback. It is the result of their generous contribution of time and effort on ICT related research. The willingness to make an effort to share knowledge, concerns and special insights with the ICT community is appreciated and at last it has made this conference proceedings possible.

Samantha Thelijjagoda (Dr.)

EDITOR/CHAIRMAN - PUBLICATION COMMITTEE - NITC 2016

DISTINGUISHED PANEL OF SPEAKERS

"Enhancing quality in Government Social ICT projects"



Hon. Prof. Ashu Marasinghe
Member of Parliament
Visiting Professor - International Uni. , Japan

"Leveraging Cloud"



Ms. Michelle Beveridge
Chief Information Officer
Intrepid Group

"Affordable internet as a catalyst for broadband adoption and economic growth"



Mr. Supun Weerasinghe
Group Chief Operating
Robi Axiata Ltd - Kuala Lumpur

"Enhancing sustainable development in Sri Lanka - A key role for ICT"



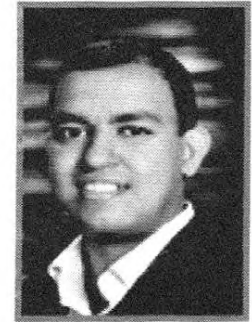
Prof. Mohan Munasinghe
Vice - Chair
Intergovernmental Panel on Climate Change

"Remaining quality in a highly dynamic and agile environment, focused on driving a richer customer experience through digital disruption"



Ms. Chinthi Weerasingha
Vice President & Global Head of Sales
VIRTUSA

"Consumerisation of Enterprise Software. Riding the next wave"



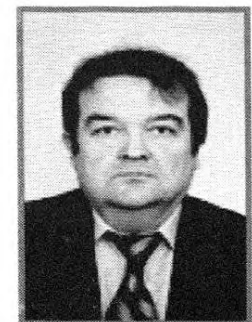
Mr. Chandika Jayasundera
CEO & Co-Founder
Cinergix

"Evolutionary Computing for Industrial Automation"



Prof. Lalith Gamage
CEO / Managing Director
SLIIT

"Digital Disruption taking place due to cloud computing"



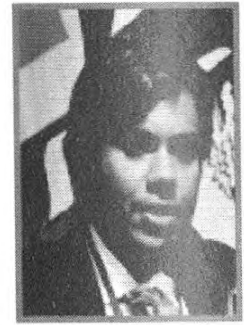
Dr. Dimiter Velez
University of National World Economy
Sofia, Bulgaria

"Developer's QA Toolkit"



Mr. Chamil Kirieldeniyage
Software Architect
Zone 24x7

"Digital Disruption to fight corruption: I paid a bribe"



Mr. Asanga Abeygoonasekara
International Columnist,
Commentator & Author

"What can opensource and open data do for Sri Lanka?"



Dr. Srinath Perera
Software Architect
Co-Founder of Apache Axis2 Project

"IOT in real life"



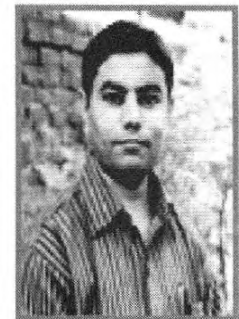
Mr. Shageevan Sachithanandan
Director / Consultant
ESOFT Technologies

"Current Trends and Research - Challenges of Multimedia Cloud Computing with Open Source Technologies"



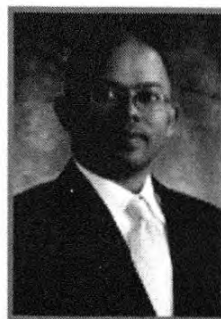
Dr. Rashed Mustafa
Associate Professor
University of Chittagong, Bangladesh

"Critical Study and Analysis of Usefulness of Massive Open Online Courses"



Dr. Kuntal Patel
Assistant Professor
Ahmedabad University, India

"Leveraging Cloud"



Mr. Kumaran Singaram
Global CRO
Connectcloud Inc. , Malaysia

"Digital Disruption and User Experience"



Ms. Mehrnoush Salehpour
Senior BA & User Experience Manager
Telstra International

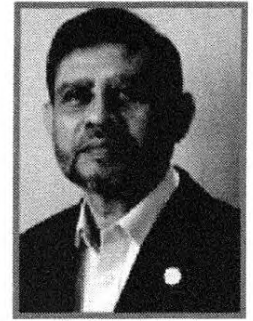
"IoT, Big Data and Analytics"



Dr. Anirban Basu

Chief Consultant & Professor
POR Software, Bangalore

"Internet: Next wave of Disruption - Opportunities and Threats"



Prof. Abhaya Induruwa

Programme Director - Department of Computing

"Digital Value Fabric: The Cornerstone of Digital Business"



Mr. Saman Perera

Senior GM - Information Systems
Mobitel (Pvt) Ltd

"Digital Health: The Healthcare of the Future"



Prof. Vajira Dissanayake

Founder Secretary General
Health Informatics Society, Sri Lanka

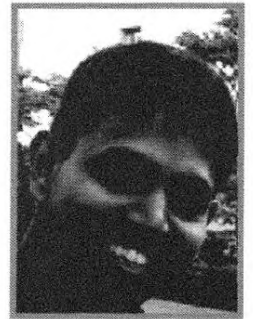
Data "Life", Protection and Continuation



Mr. Varuna Jayalath

Principal Consultant
Enterprise Solution Group - Dell Global B.V

"Computer Vision for Biomedical Informatics"



Dr. Chamidu Atupelage

Post Doctoral Researcher

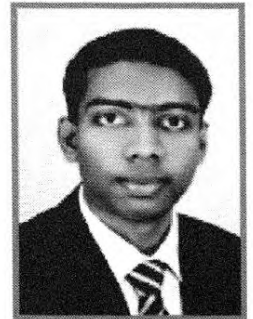
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Mr. Dhanika Perera

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Mr. Lakmal Vithanage

*"Social Impact of Digital
Disruption"*



Prof. Bipin Mehta
President
Computer Society of India

"Affordable Internet"



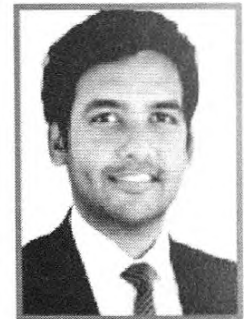
Mr. Yasiru Abeygunawardana
Head of Data & Devices
Mobitel (Pvt) Ltd

*"Internet Identifier Systems
Security and Abuse
Handling"*



Mr. Champika Wijayatunga
Regional Security Engagement Manager
Asia Pacific Internet Corporation for ICANN

*"From Disruption to
Sustainable Growth"*



Mr. Isuru Samarage
National President 2016
Junior Chamber International