

IST-Africa 2014 Conference Report

Mauritius

06 - 09 May 2014

ISTOfrica

Hosted by

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Ministry of Information and
Communication Technology



National Computer Board



AFRICAN UNION



FINECAI - DEVELOPING FINANCIAL
TECHNOLOGY AND INNOVATION COOPERATION
BETWEEN EUROPE, AFRICA AND THE LAC REGION



Introduction

IST-Africa 2014 Conference & Exhibition took place from 06 - 09 May 2014 in Mauritius, as part of **IST-Africa Week 2014**. An activity of **IST-Africa**, which is supported by the European Commission and African Union Commission and co-funded under the EU Framework Programme, **IST-Africa 2014** was the ninth in an Annual Conference Series bringing together senior representatives from leading public, private, education & research organisations, to discuss ICT policy, showcase research results and share knowledge.

European research activities are structured around consecutive multi-annual programmes, or so-called Framework Programmes. Horizon 2020 sets out the Priorities and thematic areas, including ICT, for 2014 - 2020. Horizon 2020 is fully open to international co-operation with the aim to jointly address major challenges where significant added value is expected to be gained from a world-wide R&D cooperation. In this context, the European Commission has co-funded **IST-Africa** since 2005, to promote African - European research cooperation and support Information Society and ICT aspects of the Africa-EU Strategic Partnership.

Hosted by the Government of Mauritius through the Ministry of Information Communication Technology and National Computer Board and Technically Co-Sponsored by IEEE, **IST-Africa 2014** focused on the Role of ICT for Africa's Development and specifically on Applied ICT research in the areas of eHealth, Technology Enhanced Learning and ICT Skills, Digital Libraries, Open Source Software, eInfrastructures, Societal Implications of Technology and eGovernment. **IST-Africa 2014** provided a collegiate setting for presentations and discussions of national & regional developments, issues of concern & good practice models, and networking with peers. **IST-Africa 2014** also provided an opportunity to identify potential partners for future proposals under Horizon 2020, the follow on programme to FP7, which commenced in January 2014.

IST-Africa directly supports Information Society, Innovation and ICT aspects of the Africa-EU Strategic Partnership, the African Ministerial Council on Science and Technology (AMCOST) and the Consolidated Plan of Action for the African Regional Action Plan on the Knowledge Economy (ARAPKE).

The goals of the **IST-Africa** Conference Series are Community Building to facilitate EU-African research cooperation and successful exploitation of research results, to stimulate take-up of RTD results by industry and the public sector, to promote knowledge sharing between commercial, government and research organisations, to exchange experiences about the current state of eAdoption at a sectoral, national or regional level, and to support International Cooperation and open up the European Research Area (ERA) to Africa.

Participants at IST-Africa 2014

IST-Africa 2014 Conference & Exhibition attracted over 460 delegates from 44 countries representing policy makers, practitioners, and researchers from leading commercial, government and research organisations around the world. Unlike many research conferences, **IST-Africa** provided an opportunity to meet with senior managers, practitioners, project managers, software engineers and researchers from industry, government and research organisations. Delegates and speakers attended to share knowledge, experience and lessons learnt, and network with their peers from around the world.

IST-Africa 2014 Conference & Exhibition also provided the unique opportunity to identify partners and opportunities to co-operate in international ICT research projects co-funded by the European Commission under Horizon 2020. Much of the European research results presented in this year's conference were co-funded under the FP7 ICT Programme (2007 - 2013).

The Venue

IST-Africa 2014 Conference & Exhibition took place in Le Méridien Ile Maurice, Pointe Aux Piments, Mauritius.

The Programme

The 3-day programme features an invigorating mix of business and government case studies, technical and policy papers and interactive workshops. As well as opening and closing plenary sessions, delegates participated in 38 thematically focused parallel sessions featuring different aspects of International Cooperation, eHealth, eInfrastructures, Technology Enhanced Learning and ICT Skills, Living Labs, Digital Libraries, Mobile Applications, ICT for Environmental Sustainability, eAgriculture, Societal Implications of Technology and eGovernment. Session Chairs ensured active discussion and facilitated delegate participation.

In the context of focusing on the Role of ICT for Africa's Development, the Opening Plenary on Wednesday 07 May featured a high level dialogue on Implementation of the Information Society in Africa. The Closing Plenary on Friday 09 May focused on Initiatives Supporting Development of Science, Technology and Innovation.

Horizon 2020

Horizon 2020 commenced in January 2014 as the new Framework Programme to implement the Innovation Union with research and innovation funds of €80 billion from 2014 - 2020.

Three main priorities include:

- Excellence Science – Research Infrastructures, Marie Curie (Mobility Grants), Future and Emerging Technologies
- Leadership in Enabling and Industrial Technologies (LEIT) – Components & Systems, Advanced Computing, Future Internet, Content Technologies and Information Management, Robotics, Micro and Nano-electronics and photonics
- Societal Challenges – Health, Food Security & Agriculture, Energy, Transport, Climate action and Environment, Innovation and Reflective Societies and Secure Societies

The IST-Africa Guide to 2014 Calls for Proposals within Horizon 2020 provides an overview of Calls, themes and deadlines within the Marie Curie, eInfrastructures, Leadership in Enabling and Industrial Technologies (LEIT) and each of the Societal Challenges Work Programmes.

Please visit

www.ist-africa.org/home/default.asp?page=horizon2020

to download the individual Work Programmes and IST-Africa Guide to 2014 Calls for Proposals.

Living Labs Workshop, 06 May

The fourth IST-Africa Annual Living Lab Thematic Working Group Meeting took place on Tuesday 06 May 2014.

This workshop facilitated knowledge sharing and collaboration between Innovation Stakeholders and operators of Living Labs and Innovation Spaces, building on progress achieved at previous Working Group Meetings in Nairobi (2013), Dar es Salaam (2012) and Gaborone (2011). This participatory working group meeting continued building a network of experts, public, private, education and research and societal stakeholders and entrepreneurs committed to Collaborative Innovation as a mechanism to support sustainable socio-economic development in Africa.

Conference Proceedings

The **IST-Africa 2014** conference proceedings was published on CD-ROM and on the Conference Portal. Following the conference, registered delegates have access to all PowerPoint presentations, which will be published on the Conference Portal. The **IST-Africa 2014** Conference Proceedings will also be submitted for publication in IEEE Xplore.

Support Organisations

IST-Africa 2014 was hosted by the Government of Mauritius through the Ministry of Information and Communication Technology and National Computer Board. Other Support organisations included SAP, Orange, FinCEAL project and Air Mauritius as official airline carrier. IST-Africa 2014 was technically co-sponsored by IEEE Mauritius Subsection and IEEE UK & Ireland Social Implications of Technology

Chapter.

IST-Africa Initiative

Supported by the European Commission (EC) and African Union Commission (AUC), and Co-Funded under FP7 (Contract 611795), **IST-Africa** facilitates and supports:

- International Innovation, Research and Policy Cooperation
- Knowledge Sharing and Skills Transfer between IST-Africa Partners
- Collaborative Innovation, Entrepreneurship & Adoption of Living Labs
- Africa – EU Strategic Partnership (Information Society, ICT, Innovation)

IST-Africa Activities include:

- Annual IST-Africa Week Hosted by IST-Africa Partner Governments
- Analysis of African Adoption, Implementation, Policy and Research Priorities
- Analysis of African Innovation Spaces, Living Labs and Research Capacity of HEIs
- Horizon 2020 and Living Labs Training Workshops in IST-Africa Partner Countries to Support Research-Capacity Building and Accelerate Information Society Development and ICT Adoption across Africa
- Participation in Information Society, ICT and Innovation related International Cooperation (including Africa - EU Strategic Partnership, EU - AUC Living Labs Taskforce for Africa, CODIST - UNECA and WSIS)
- Horizon 2020 Help Desk supporting African - European Research Collaboration

IST-Africa is a collaborative initiative between IIMC International Information Management Corporation Limited (Ireland, Coordinator), Ministerio da Ciencia e Tecnologia (Angola), Department of Science and Technology (South Africa), Ministry of Infrastructure, Science and Technology (Botswana), Ministry of Communications, Science and Technology (Lesotho), Ministry of Education (Namibia), ICT Policy Implementation Technical Unit (Mozambique), National Computer Board (Mauritius), Ministry of Information Communication Technology (Swaziland), National Commission for Science and Technology (Malawi), COSTECH - Tanzania Commission for Science and Technology, Uganda National Council for Science and Technology, Ministry of Higher Education, Science and Technology (Kenya), Ministère de l'Enseignement Supérieur et de la Recherche Scientifique (Burundi), Ministry of Science and Technology (Ethiopia), Agence Nationale des Technologies de l'Information et de la Communication (Cameroon), Ministère de l'Enseignement Supérieur, des Universités et de la Recherche (Senegal), Ministère de l'Enseignement Supérieur et de la Recherche Scientifique (Tunisia) and MCIT (Egypt).

Plenary Session Speakers



Hon. Tassarajen Pillay
Chedumbrum
Minister of ICT Mauritius



Dan Faugoo
Executive Director,
NCB, Mauritius



Dr M.K. Oolun
Executive Director,
ICT Authority, Mauritius



Dr A Suddhoo
Executive Director,
Mauritius Research Council



Prof A.K. Bakhshi
Executive Director,
TEC, Mauritius



Mr Moctar Yedaly
Information Society Division
African Union Commission



Mr Morten Møller
DG CONNECT
European Commission



Prof R. Mohee
CSK, Vice-Chancellor,
University of Mauritius



Dr H.B. Chitto
Director General,
UTM, Mauritius



Prof Darelle Van Greunen
Nelson Mandela Metropolitan
University, South Africa

Plenary Speakers included:

- **Hon. Tassarajen Pillay Chedumbrum**, Minister of Information and Communication Technology, Mauritius
- **Mr Suraj Ramgolam**, Chairman, National Computer Board, Mauritius
- **Mr Dan Faugoo**, Executive Director, National Computer Board, Mauritius
- **Dr M. K Oolun**, Executive Director, ICT Authority
- **Dr A Suddhoo**, Executive Director, Mauritius Research Council
- **Prof. A.K. Bakhshi**, Executive Director, Tertiary Education Commission (TEC), Mauritius
- **Mr N. Jugmohunsing**, Assistant Permanent Secretary, Ministry of Tertiary Education, Science, Research and Technology, Mauritius
- **Mr Jean Claude de l'Estrac**, Secretary General, Indian Ocean Commission
- **Zauria Saifodine**, Director of ICT Capacity Building, Instituto Nacional de Tecnologias de Informação, e Comunicação, Mozambique
- **Mr Moctar Yedaly**, Head of Information Society Division, African Union Commission
- **Mr Morten Møller**, Programme Coordination, DG CONNECT, European Commission, Belgium
- **Prof Romeela Mohee**, CSK, Vice-Chancellor, University of Mauritius
- **Dr Hemant Chitto**, Ag. Director General, University Technology Mauritius
- **Prof Darelle Van Greunen**, School of ICT, Nelson Mandela Metropolitan University, South Africa
- **Mr Moses Bayingana**, ICT Expert, Information Society Division, African Union Commission
- **Maryse Chung**, Mauritius Sugar Industry Research Institute
- **M. V. Ramana**, Mauritius Oceanography Institute
- **K. Poonoosamy**, Managing Director, Board of Investment, Mauritius

International Programme Committee

A distinguished Programme Committee was formed to review and provide feedback on papers and presentations, and chair sessions.

The **IST-Africa 2014** International Programme Committee includes

- **Paul Cunningham** (Conference Chair), IIMC International Information Management Corporation Ltd, Ireland
- **Perienen Appavoo**, Open University of Mauritius
- **Dr Vinaye Armoogum**, School of Innovative Technology and Engineering, University of Technology, Mauritius
- **Sheeba Armoogum**, Faculty of Engineering, University of Mauritius
- **Dr Vandana Bassoo**, Faculty of Engineering, University of Mauritius
- **Dr Pierre Catherine**, School of Innovative Technology and Engineering, University of Technology, Mauritius
- **Laurens Cloete**, Meraka Institute, CSIR, South Africa
- **Miriam Cunningham**, IIMC International Information Management Corporation Ltd, Ireland
- **Kim Davis**, Research Council of Norway, Norway
- **Razvi Doomun**, Department of Computer Science and Engineering, University of Mauritius
- **Prof. Love Ekenberg**, DSV, University of Stockholm, Sweden
- **Ravi Foogoo**, School of Innovative Technology and Engineering, University of Technology, Mauritius
- **Dr David Gichoya**, Moi University, Kenya
- **Prof. Marlien Herselman**, Living Labs of Southern Africa Network, South Africa
- **Dr Mussawir Hosany**, Faculty of Engineering, University of Mauritius
- **Dr. Mike Joy**, University of Warwick, United Kingdom
- **Dr. Bernhard R. Katzy**, CeTIM, The Netherlands
- **Kristiina Lahde**, TANZICT Programme, Tanzania
- **Assil Lotun**, Mauritius
- **Gareth MacNaughton**, CISCO, United Kingdom
- **Dr Ayub Many**, Ministry of Health, Kenya
- **Prof. Maurice Mars**, University of KwaZulu-Natal, South Africa
- **Girish Mautadin**, Mauritius

- **Loi Namugenyi**, Uganda National Council for Science & Technology
- **Dr Sue Pendell**, Colorado State University, United States
- **Amreesh Phokeer**, AFRICNIC, Mauritius
- **Sameerchand Pudaruth**, Computer Science and Engineering Department, University of Mauritius
- **Matti Sinko**, Finland
- **Bernard Stevenot**, SpaceBel, Belgium
- **Richard Stevens**, Stevens Consultants, Italy
- **Dr Geerish Suddul**, School of Innovative Technology and Engineering, University of Technology, Mauritius
- **Roopesh Sungkur**, Faculty of Engineering, University of Mauritius
- **Prof. Darelle Van Greunen**, Nelson Mandela Metropolitan University/Computer Society of South Africa

Organising Committee

- **Miriam Cunningham**, IIMC, Ireland
- **Paul Cunningham**, IIMC, Ireland
- **Dan Faugoo**, National Computer Board, Mauritius
- **Ismael Limalia**, National Computer Board, Mauritius



National Computer Board

Conference Secretariat

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www.IST-Africa.org/Conference2014



Wednesday, May 07, 2014

08:00

Registration

09:00 Opening Plenary 1a: [Opening Plenary](#)Moderator: [Verna Pillay, Ministry of ICT, Mauritius](#)**Welcome Address**

Dan Faugoo, Executive Director, National Computer Board, Mauritius

European Commission Address

Morten Møller, Programme Coordination, DG CONNECT, European Commission, Belgium

IOC Address

Jean Claude de l'Estrac, Secretary General, Indian Ocean Commission

African Union Commission Address

Mochtar Yedaly, Head of Information Society Division, African Union Commission

Official Opening Speech

Hon. Tassarajen Pillay Chedumbrum, Minister of Information and Communication Technology

10:30

Coffee Break

11:00 Plenary Session 2a: [High-level Roundtable on Implementation of the Information Society in Africa](#)Moderator: [Paul Cunningham, IIMC, Ireland](#)**RoundTable Participants included:**

Mr Suraj Ramgolam, Chairman, National Computer Board, Mauritius

Dr M. K Oolun, Executive Director, ICT Authority, Mauritius

Dr A Suddhoo, Executive Director, Mauritius Research Council

Mr N. Jugmohunsing, Assistant Permanent Secretary, Ministry of Tertiary Education, Science, Research and Technology, Mauritius

Prof. A.K. Bakhshi, Executive Director of Tertiary Education Commission (TEC), Mauritius

Zauria Saifodine, Director of ICT Capacity Building, Instituto Nacional de Tecnologias de Informação, e Comunicação, Mozambique

Mochtar Yedaly, Head of Information Society Division, African Union Commission

Prof Romeela Mohee, CSK, Vice-Chancellor, University of Mauritius

Dr Hemant Chitto, Ag. Director General, University Technology Mauritius

Prof Darelle Van Greunen, School of ICT, Nelson Mandela Metropolitan University, South Africa

12:30

Lunch

14:00 Workshop 3a: [Horizon 2020](#)**Joint IST-Africa CAAST-Net Plus Session**Moderator: [Paul Cunningham, IIMC, Ireland](#)**IST-Africa**

Paul Cunningham, IIMC / IST-Africa, Ireland

CAAST-Net Plus

Melissa Plath, UniPID, University of Jyväskylä, Finland

Introduction to Horizon 2020

Morten Møller, Programme Coordination, DG CONNECT, European Commission

Agriculture, Health, Environment 2014/2015 Calls in H2020

Melissa Plath, UniPID, University of Jyväskylä, Finland

George Essegbey, CSIR, Science and Technology Policy Research Institute, Ghana

LEIT (ICT) 2015 Calls in H2020

Paul Cunningham, IIMC / IST-Africa, Ireland

During the coffee break participants are invited to list their institution, dept and research areas in the areas of LEIT and Societal Challenges on the flip chart

14:00 Session 3c: [Technology-enhanced Learning](#)Chair: [Perienen Appavoo, Open University of Mauritius](#)**Adoption of e-Assessment in Strathmore University**

Delphine Mukandutiye, Strathmore University, Kenya

Incorporating a Guided Problem-Solving Method into Activemath using the House Model and Logistic Regression

Kyle Stone, Tshwane university of Technology, South Africa

Students Experiences of Using Wiki Spaces to Support Collaborative Learning in a Blended Classroom; A Case of Kenyatta and KCA Universities in Kenya

Rhoda Gitonga, Kenyatta University, Kenya

Exploring Three Approaches to Offer Distance Learning Courses through a Social Network of Health Researchers in Three African Countries

Maximo Ramirez Robles, Universidad Politécnica de Madrid, Spain

Are Facebook "likes" Enough to Assess Student Satisfaction in Open Distance Learning (ODL)? An Incursion into Students' Experience of ODL through Online Social Networks (OSNs)

Mrinal Soharaye, Open University of Mauritius

14:00 Session 3d: [Mobile Applications I](#)Chair: [Sameerchand Pudaruth, University of Mauritius](#)**Connectivity within Indian Ocean Islands (Mauritius, Seychelles, Comoros, Reunion and Madagascar) – A Case for a Regional Internet Exchange**

Mahen Soobron, Ministry of ICT, Mauritius

Towards a Collaborative Approach to Web Service Monitoring: In Appreciation of Connectivity Challenges in Africa

Ishmael Makitla, CSIR - Meraka Institute / Nelson Mandela Metropolitan University, South Africa

Securing Mobile Applications in Hostile Rural Environments

Rossouw De Bruin, University of Johannesburg, South Africa

14:00 Session 3e: [eGovernment](#)Chair: [Vyankoj Mulloo, National Computer Board, Mauritius](#)**Case Study Mauritius: Successful Implementation of Innovative Public Revenue Management Solutions**

Hannes Venter, SAP Africa, South Africa

Next Generation Citizen Centric e-Services

Vikas Sharma, PricewaterhouseCoopers Ltd, Mauritius

Exploring the Success, Failure and Factors Influencing mGovernment Implementation in Developing Countries

Olalekan Samuel Ogunleye, University, South Africa

The e-Service Delivery in South Africa and the Contribution of Research Institutions

Nare Mahwai, CSIR, South Africa

State Information Protection Laws and e-Transparency

Edison Lubua, University of KwaZulu Natal, South Africa

15:30

Coffee Break

16:00 Workshop 4a: [Horizon 2020](#)**Joint IST-Africa CAAST-Net Plus Session**Moderator: [Paul Cunningham, IIMC, Ireland](#)**Overview of Horizon 2020 Participation Rules & Instruments**

Miriam Cunningham, IIMC / IST-Africa, Ireland

Proposal Preparation

Paul Cunningham, IIMC / IST-Africa, Ireland

Discussion, Q&A

Morten Møller, Programme Coordination, DG CONNECT, European Commission

Paul Cunningham, IIMC / IST-Africa, Ireland

Melissa Plath, UniPID, University of Jyväskylä, Finland

George Essegbey, CSIR, Science and Technology Policy Research Institute, Ghana

Brokerage Session

Each participating organisation has a maximum of one minute to outline their research areas, track record and why delegates should meet with them during the conference to discuss collaboration.

16:00 Session 4c: [Technology Enhanced Learning in Higher Education Institutions](#)

Chair: [David Gichoya](#), [Moi University, Kenya](#)

Flipping an Online PhD Programme between Sudan and South Africa
Laurie Butgereit, NMMU, South African and Izzeldin Osman, Sudan
University of Science and Technology, Sudan

Use of Cloud Computing Platform for E-Learning in Institutions of Higher Learning in Kenya

Tabitha Kihara, Moi University, Kenya

A Cloud-based Architecture for eEducation Content Provision: The Case of Nciba Circuit of the Comfivaba District of South Africa
Nomusa Dlodlo, CSIR, South Africa

16:00 Session 4d: [Mobile Applications II](#)

Chair: [Vinaye Armoogum](#), [University of Technology, Mauritius](#)

Challenges Encountered by Older Adults while Navigating Mobile Device User Interfaces

Margaret Ngugi, Jomo Kenyatta University of Agriculture and Technology, Kenya

Visual Interfaces as an Approach for providing Mobile Services and Mobile content to low literate users in South Africa
Muzi Matyila, CSIR, South Africa

The Adoption of Mobile Technology as a Tool for Situational Crime Prevention in Kenya

Collins Oduor, @iLabAfrica, Strathmore University, Kenya

Integration of Mobile, Big Data, Sensors, and Social Media: Impact on Daily Life and Business

Mario Gastaldi, Evonue Digital, Mauritius

16:00 Session 4e: [eGovernment II](#)

Chair: [Pierre Clarel Catherine](#), [University of Technology, Mauritius](#)

Development of a Data Model for Semantic Exploitation of Municipality Records in South Africa

Desmond Mogotlane, Vaal University of Technology, South Africa

Leveraging Linked Data to Enhance Programmers' Access to Government Open Data

Isaiah Mulang', Jomo Kenyatta University of Agriculture and Technology, Kenya

Impediments to Interagency Statistical Information Sharing amongst Government agencies in Uganda: a G2G Adoption
Flavia Kyeyago, Uganda Bureau of Statistics, Uganda

Towards the Development of a Citizen-Centric Framework for Evaluating the Impact of E-government: A Case Study of Developing Countries

Ibrahim Otieno, University of Nairobi, Kenya

17:30 End of Parallel Sessions

19:00 Networking Reception - Supported by IST-Africa and FinCEAL

20:00 Conference Dinner - Hosted by Ministry of ICT



Thursday,
May 08, 2014

09:00 Session 5a: [eHealth - Health Service Delivery](#)

Chair: [Darelle Van Greunen](#), [Nelson Mandela Metropolitan University, South Africa](#)

Interoperability Study on eHealth Services for the Sub-Saharan Africa Region

Ghislain De La Sayette, Astrium, France

Scoping Global Good eHealth Platforms: Implications for Sub-Saharan Africa

Karl Stroetmann, empirica GmbH, Germany

Linking Risk and Resource Mapping for the Determination of Favorable Locations of Wells in GIS

Melanie Platz, University of Koblenz Landau, Campus Landau, Germany

Development of a Mathematical Model to Estimate Negative Impacts on Human Health with the Help of Risk Maps and Fuzzy Membership Functions

Jörg Rapp, University of Koblenz-Landau, Campus Landau, Germany

SmartPrescription: A Principled Approach Towards Eliminating Prescription Errors in Healthcare

Paul Okanda, United States International University (USIU), Kenya

09:00 Workshop 5b: [IST-Africa - Research Capacities & Priorities I](#)

Chair: [Paul Cunningham](#), [IIMC, Ireland](#)

ICT Initiatives and Research Capacity in Mauritius

Dan Faugoo, National Computer Board, Mauritius

ICT Initiatives and Research Capacity in South Africa

Peacemaker Dlamini, Department of Science and Technology, South Africa

ICT Initiatives and Research Capacity in Botswana

Phodiso Phole, Ministry of Transport and Communications, Botswana

ICT Initiatives and Research Capacity in Swaziland

Vumile Dlamini, Ministry of Information and Communications Technology, Swaziland

ICT Initiatives and Research Capacity in Namibia

Ebenhezer Kauhonina, National Commission on Research, Science and Technology, Namibia

ICT Initiatives and Research Capacity in Lesotho

Lieketseng Tjokotsi, Department of Science and Technology, Lesotho

09:00 Workshop 5c: [Tablet Integration into the Classroom: A Case from the Rural Trenches](#)

Chair: [Adele Botha](#), [Meraka Institute, South Africa](#)

ICT4RED 12-Component Implementation Framework: A Conceptual Framework for Integrating Mobile Technology into Resource-constrained Rural Schools

Merryl Ford, CSIR, South Africa

Gamification beyond Badges

Adele Botha, Meraka Institute, South Africa

Interactive Workshop to introduce the Teacher Professional Development component of the ICT for Rural Education Development (ICT4RED) initiative. One module of a 10 module course will be presented to demonstrate how we have successfully facilitated ICT tablet integration in the classroom by teachers with little to no exposure to ICTs.

09:00 Workshop 5d: [Exploiting eInfrastructure for Research and Education I](#)

Chair: [Francis Tusubira](#), [UbuntuNet Alliance, Uganda](#)

Session 1: REN Infrastructure Roll out in Sub-Saharan Africa

State of UbuntuNet

Joe Kimaili, Technical Manager, UbuntuNet Alliance

State of the Research and Education Network Infrastructure in the WACREN region

Omo Oiya, WACREN, Nigeria

Addressing the Connectivity Gaps in Sub-Saharan Africa

Cathrin Stover, DANTE, UK

Summing up09:00 Session 5e: **Cyber Security**Chair: **Amreesh Phokeer, AFRINIC, Mauritius****Survey of Practical Security Frameworks for Defending SIP Based VoIP Systems against DoS/DDoS Attacks**

Sheeba Armoogum, University of Mauritius, Mauritius

The Development of a Cyber Security Policy in Developing Regions and the Impact on Stakeholders

Ian Ellefsen, University of Johannesburg, South Africa

Applying Keystroke Dynamics Techniques to Facial Thermography for Verification

George Henderson, University of Johannesburg, South Africa

An Open Speaker Recognition Enabled Identification and Authentication System

Michal Adamski, University of Johannesburg, South Africa

Requirements for Secure Graphical Passwords

Mokgadi Rasekgala, CSIR, South Africa

10:30

Coffee Break

11:00 Session 6a: **eHealth - Health Information Systems**Chair: **Khadija Malima, COSTECH, Tanzania****A Method for Selecting E-Health Standards to Support Interoperability of Healthcare Information Systems**

Funmi Adebesein, Council for Scientific and Industrial Research, South Africa

Health Management Information Systems (HMIS) Implementation Characteristics that Influence the Quality of Healthcare in Private Hospitals in Kenya

Jimmy Macharia, United States International University, Kenya

Implementing eHealth in Tanzania: Opportunities and Challenges 2009 - 2014

Khadija Malima, COSTECH, Tanzania

Open Source Software and Bureaucracy: A Case of Health Information System in Zanzibar

Abubakar Bakar, The State University of Zanzibar, Tanzania

Perception of Sudan Peritoneal Dialysis Program's Staff to Medical Electronic Records

Rafaa Ashamallah Ghobrial Morgos, Ministry of Science & Communication, Sudan

11:00 Workshop 6b: **IST-Africa - Research Capacities & Priorities II**Chair: **Paul Cunningham, IIMC, Ireland****ICT Initiatives and Research Capacity in Malawi**

Ebony Msikawanthu, National Commission for Science and Technology, Malawi

ICT Initiatives and Research Capacity in Mozambique

Zauria Saifodine, National Institute for ICT, Mozambique

ICT Initiatives and Research Capacity in Angola

Antonio Alcochete, Ministerio da Ciencia e Tecnologia, Angola

ICT Initiatives and Research Capacity in Tunisia

Noureddine Hamdi, Ministère de l'Enseignement Supérieur et de la Recherche Scientifique, Tunisia

ICT Initiatives and Research Capacity in Egypt

Haitham Hamza, Information Technology Industry Development Agency (ITIDA), Egypt

ICT Initiatives and Research Capacity in Senegal

Toumane Doumbouya, Ministère de l'Enseignement Supérieur et de la Recherche, Senegal

11:00 Session 6c: **Technology Enhanced Learning**Chair: **Love Ekenberg, Stockholm University, Sweden****m-Learning System Enhancing Mathematical Concepts (m-LEMC): A Case Study of University of Namibia and Rhodes**

Jameson Mbale, University of Namibia, Namibia

Study Examining Whether the Computer Science Curriculum at the Sudanese High Secondary Schools is Adequate to Qualify the Students to be Computer Literate

Atika ElMubarak, Sudan University of Science and Technology, Sudan

Translation between English and Mauritian Creole: A Statistical Machine Translation Approach

Aneerav Sukhoo, Central Information Systems Division, Mauritius

Made in Africa: African Digital Creativity

Alfredo M. Ronchi, Politecnico di Milano, Italy

11:00 Workshop 6d: **Exploiting eInfrastructure for Research and Education II**Chair: **Omo Oiya, WACREN, Nigeria****Session 2: Panel Discussion on Enabling Communities of Practice****Digital Learning Resources**

Bakary Diallo, African Virtual University, Nairobi

SKA

Leon Staphorst, SANREN, South Africa

Grid-Computing

Bruce Becker, SAGRID, South Africa

11:00 Session 6e: **Security, Authentication & Biometrics**Chair: **Razvi Doomun, University of Mauritius****Information Security Initiatives and Challenges in Mauritius**

Kaleem Usmani, CERT-MU, National Computer Board, Mauritius

The Poor Man's Biometric: Identifying Cost-Effective Biometric System Criteria for SMME's

Dustin van der Haar, University of Johannesburg, South Africa

Choice of Biometrics

Bibi Nazmeen Boodoo-Jahangeer, University of Mauritius

Hand Biometrics for Security

Maleika Heenaye-Mamode Khan & Naushad Mamode Khan, University of Mauritius

Streamlined Approach to Online Banking Authentication in South Africa and Europe

Frans Blauw, University of Johannesburg, South Africa

Online Social Networks to Online Social Malworks - the Evolution of an Industry

Candice Louw, University of Johannesburg, South Africa

12:30

Lunch

14:00 Session 7a: **eHealth**Chair: **Sejojo Phaaroo, Health Research and Laboratory Services, Lesotho****A Secure Data Access Model for the Mauritian Healthcare Service**

Oveeyen Moonian, University of Mauritius

A Framework for Implementing Cloud Computing for Record Sharing and Accessing in the Ghanaian Healthcare Sector

Nana Assyne, Ghana Institute of Management and Public Administration (GIMPA), Ghana

An Integrative ICT Platform for eHealth

Ronell Alberts, CSIR, South Africa

Compiling a Prioritized List of Health Data Quality Challenges in Public Healthcare Systems

Marna Botha, CSIR, South Africa

Implementing Modular Interactive Tiles for Rehabilitation in Tanzania - A Pilot Study

Henrik Hautop Lund, Technical University of Denmark, Denmark

14:00 Workshop 7b: **IST-Africa - Research Capacities & Priorities III**Chair: **Paul Cunningham, IIMC, Ireland****ICT Initiatives and Research Capacity in Cameroon**

National Agency for Information and Communication Technologies (ANTIC), Cameroon

ICT Initiatives and Research Capacity in Kenya

Jacob Njagih, Ministry of Education, Science and Technology, Kenya

ICT Initiatives and Research Capacity in Uganda

Loi Namugenyi, Uganda National Council for Science & Technology

ICT Initiatives and Research Capacity in Burundi

Tatien Masharabu, Ministry of Higher Education and Scientific Research, Burundi

ICT Initiatives and Research Capacity in Tanzania

Khadija Malima, Tanzania Commission for Science and Technology

ICT Initiatives and Research Capacity in Ethiopia

Leulseged Alemie, Ministry of Communications and Information Technology, Ethiopia

14:00 Session 7c: **eSkills**

Chair: **Vandana Bassoo**, University of Mauritius

Uncovering the Competency Gap of Students Employed in Business Process Analyst Roles – An Employer Perspective

Lisa Seymour, University of Cape Town, South Africa

Streamlining Knowledge and Skills Sharing in Africa

Bishoy Louis, Information Technology Institute, Egypt

A Conceptual Framework of 21st Century Employability Skills & Competencies in Hospitality Industry of Kenya: Case of Waiters & Stewards

Anuradha Khoda, University of Nairobi, Kenya

14:00 Workshop 7d: **IPv6 Based IoT/M2M, Cloud Computing and ISP/ University/NREN Deployment**

Chair: **Latif Ladid**, IPv6 Forum - SnT University of Luxembourg

IPv6 based M2M/Internet of Things (IoT)

Latif Ladid, President IPv6 Forum, Luxembourg

Impact of IPv6 and IoT on Africa

Adiel A. Akplogan, AFRINIC, Mauritius

Deployment of IPv6 at the University of Mauritius

Aatish Chiniah, University of Technology, Mauritius

14:00 Session 7e: **Societal Implications of Technology**

Chair: **Haitham Hamza**, ITIDA, Egypt

Beyond Access: ICT Use in Business by Micro, Small and Medium-sized Enterprises in Ghana and Zambia

Victor Konde, United Nations Economic Commission for Africa, Zambia

Social Services on Wheels: A Sustainable Model to Improve Access in Unreached Communities

Jecinta Kamau, Kyushu University, Japan

User Willingness to accept Friend Requests on SNS: A Facebook Experiment

Frederik Hattingh, Tshwane University of Technology, South Africa

The Impact of Science, Technology and Innovation to the Informal Sector in Uganda

Aminah Bukenya, UNCST, Uganda

15:30

Coffee Break

16:00 Session 8a: **eHealth**

Chair: **Loi Namugenyi**, Uganda National Council for Science & Technology

Predicting Adoption of Mobile Health Technology in Resource Constrained Environments

Gilbert Maiga, Makerere University, Uganda

A Review of Factors Influencing eHealth Adoption In Kenya: Barriers And Facilitators

Jasper Ondulo, Jaramogi Oginga Odinga University Science and Technology, Kenya

Leveraging Health through the Enhancement of Information Access Using Mobile and Service Oriented Technology

Silvester Namuye, USIU, Kenya

Social Simulation for Optimization of Emergency Health Services Policy

Mateus Calado, Universidade Agostinho Neto, Angola

Giving Hope to Refractory Epileptic Patients

Antonio Dourado, University of Coimbra, Portugal

16:00 Workshop 8b: **ICT Initiatives in Mauritius**

Chair: **Suraj Ramgobal**, Chairman, National Computer Board, Mauritius

e-Government initiatives in Mauritius

Rajnish Hawabhay, Central Informatics Bureau, Mauritius

eFiling of Tax Returns in Mauritius

Soobhash Sonah, Mauritius Revenue Authority

Rethinking the Education System of Mauritius: Integrating ICT Tools

Ricaud Auckbar, Ministry of Education, Mauritius

Capability of the Mauritian ICT industry to Export in the Region

Neemalen Gopal, Mauritius IT Industry Association, Mauritius

Establishing A Digital Cadastre - The LAVIMS Project

Navinchandra Luchoo, MHL / LAVIMS, Mauritius

16:00 Session 8c: **Digital Libraries & Digital Preservation**

Chair: **Ebony Msikwanthu**, National Commission for Science and Technology, Malawi

Direct Desktop-Repository Deposits with SWORD

Gontlafetse Mosweunyane, University of Botswana

An Overview of Digital Library Projects in Kenyan Universities

Elyjoy Micheni, The Technical University of Kenya

Data Structures for Information Retrieval

Denis Nkweteyim, University of Buea, Cameroon

A Case for Understanding User Experience Challenges confronting Indigenous Knowledge Recorders in Rural Communities in South Africa

Gugu Khalala, CSIR, South Africa

16:00 Session 8d: **eInfrastructures**

Chair: **Njei Check**, ANTIC, Cameroon

Experience and feedbacks from the sustainability for the Virtual Atomic and Molecular Data Centre E-infrastructure

Carlo Maria Zwölf, Observatoire de Paris, France

Perun - Modern Approach for User Identity and Service Management

Michal Procházka, CESNET, Czech Republic

The Role of Governments in IPv6 Transition

Jiri Prusa, CZ.NIC Association, Czech Republic

Using iMENTORS and Open aid Data to Enhance Coherence of International Aid

Louis Papaemmanuel, eGovLab, Stockholm University, Sweden

16:00 Session 8e: **Societal Implications of Technology**

Chair: **Lieketseng Tjokotsi**, Department of Science and Technology, Lesotho

Raising Girls' Voices with SenseMaker

Rebecca Smith, GirlHub, United Kingdom

Transforming Fragmented Industry into Sustainable Businesses with SMAC Technologies

Subhas Thecka, Charles Telfair Institute, Mauritius

The Potential Value of Mobile Microwork Services in Developing Nations: Research Opportunities and Challenges

Jabu Mtsweni, University of South Africa, South Africa

17:30

End of Parallel Sessions



Friday,
May 09, 2014

09:00 Session 9a: **Cloud Computing**

Chair: **David Gichoya**, Moi University, Kenya

A Business Model for a South African Government Public Cloud Platform

Promise Mvelase, CSIR, South Africa

Cloud Computing Can Re-Shape Uganda

Collins Mwesigwa, Icon Frontiers Uganda Limited, Uganda

Presenting a Framework Utilising the Cloud to Facilitate Asset Management

Willem J.J. Thompson, Tshwane University of Technology, South Africa

09:00 Workshop 9b: **Living Labs in Tanzania**Chair: **Kristiina Lahde, TanzICT Programme, Tanzania****Tanzanian Living Labs - Background**

Kristiina Lahde, TanzICT Programme, Tanzania

Rapid Growth in a New Living Lab

Novat Karol, Elimu Living Lab, Tanzania

The Challenges of Community-driven Innovation in a University-led Living Lab

Joshua Jacob Mushi, Arusha EcoLab /NM-AIST, Tanzania

GROW Leadership Academy - Experience and Social Franchising with RLabs South Africa

Yusuf Ssessanga, RLabs-Iringa, Tanzania

Lessons from Tanzanian Living Labs - the First Years

Simon Flamand, TANZICT, Tanzania

09:00 Session 9c: **Open Source & Open Data Applications**Chair: **Roopesh Kevin Sungkur, University of Mauritius****Efficiency and Effectiveness of National Systems of Innovation:****The Importance of ICT, the Cases of Ghana and Kenya**

Liliana Andriano, UNIDO, Austria

Ambient Intelligence Framework for Web Services aimed at Elderly Users

Maria Panou, Centre for Research and Technology Hellas, Greece

SmartTouristData Approach for connecting local and global tourist information systems

Premysl Vohnout, Czech Centre for Science and Society, Czech Republic

SDI4Apps

Zbynek Krivanek, Ceske centrum pro Vedu a Spolecnost, Czech Republic

09:00 Workshop 9d: **NCP Training (Closed meeting)**09:00 Session 9e: **eAgriculture**Chair: **R.K. Ramnauth, Food and Agricultural Research and Extension Institute (FAREI), Mauritius****Cattle Monitoring System Using Wireless Sensor Network in Order to Prevent Cattle Rustling**

Patrick Nkwari, University of Johannesburg, South Africa

PotatoSense: A Wireless Sensor Network System for Precision Agriculture

Kavi Kumar Khedo, University of Mauritius, Mauritius

A Prototype Mobile Monitoring System for Hydroponic Agriculture

Loic Ndam, Nelson Mandela Metropolitan University, South Africa

FOODIE – Open Data for Agriculture

Karel Charvat, Help service remote sensing s.r.o., Czech Republic

10:30

Coffee Break

11:00 Session 10a: **ICT Regulatory Frameworks**Chair: **Peacemaker Dlamini, DST, South Africa****Understanding the Maturity of EU Code of Conduct on Data Centres: A Mauritian Case Study Explained**

Ashwin Seegolam, National Computer Board, Mauritius

The Institutionalisation of Political and Corporate Governance of Information and Communication Technology in the Public Service of South Africa, a Developing Country

Tersia van der Walt, University of Johannesburg, South Africa

The Importance of ICT Policy in Achieving the Health Millennium Development Goals (MDGs) in Tanzania

Manoj Maharaj, University of KwaZulu-Natal, South Africa

11:00 Session 10b: **Innovation Leveraging Living Labs**Chair: **Darelle Van Greunen, Nelson Mandela Metropolitan University, South Africa****A Model for the Transformation of the Mauritian Classroom based on the Living Lab Concept**

Mohammad Issack Santally, University of Mauritius

Co-Constructive ePower Loop – Citizen Driven Innovation in Region Västerbotten, Northern Sweden

Olov Forsgren, Stockholm University, Sweden

A Proposed Living Lab Methodological Framework for Namibia

Nobert Jere, Polytechnic of Namibia, Namibia

User Experience of Pervasive Healthcare applications used by Community Healthcare Workers in the Eastern Cape, South Africa

Alida Veldsman, Nelson Mandela Metropolitan University, South Africa

Factors Impacting Tablet PC Usage in Low-income Communities: A Case Study of South Africa

Darelle Van Greunen, Nelson Mandela Metropolitan University, South Africa

11:00 Workshop 10c: **Cooperation with Finnish Institutions: Highlighting Expertise and Partnership Opportunities**Chair: **Eva Kagiri, UniPID, Finland****Strengthening Cooperation on Science, Technology and Innovation between Finland, Africa and Europe**

Eva Kagiri, UniPID, Finland

Living Labs – UFISA Project

Minna Fred, University of Helsinki, Finland

EnhANCE - A Partnership for Positioning African Universities to Spearhead Development of Local Mobile and Wireless Networks

Edward Mutafungwa, Aalto University, Finland

CIER Project - Converged Infrastructure for Emerging Regions

Juha Zidbeck, VTT – Technical Research Centre of Finland

Networking Session with Finnish Partners - 12 representatives from different Finnish Institutions will give 2 min pitches highlighting their areas of expertise and what kind of partners they are looking for. Participants will then get an opportunity to have one-on-one meetings with the representatives and discuss collaboration opportunities

11:00 Workshop 10d **NCP Training (Closed meeting)**11:00 Session 10e: **Environmental Sustainability**Chair: **Ravi Foogooa, University of Technology, Mauritius****CrowdSourced Weather Reports: An Implementation of the µ Model for Spotting Weather Information in Twitter**

Laurie Butgereit, Nelson Mandela Metropolitan University, South Africa

A Wireless Sensor Network Framework for Large-Scale Industrial Water Pollution Monitoring

Yohannes Derbew, Moha Soft Drink Industries (PEPSI), Ethiopia

A Self Green ICT Maturity Assessment Tool for SMEs

Ravi Foogooa, University of Technology, Mauritius

Experience in implementing multi-country Energy Information Systems in West Africa and MENA regions

Mohamad Mahgoub Hamid, RCREEE - Regional Center for Renewable Energy and Energy Efficiency, Egypt

12:30

Lunch

13:30 **Closing Plenary 11**Chair: **Vishnou Gondeea, Permanent Secretary, Ministry of Information and Communication Technology, Mauritius****African Internet Exchange System (AXIS)**

Moses Bayingana, African Union Commission, Ethiopia

Land Use Mapping using Satellite imagery - the Mauritian Experience

Maryse Chung, Mauritius Sugarcane Industry Research Institute

Prospects of Oceanography - Mauritius

M. V. Ramana, Mauritius Oceanography Institute

New Economic Growth Engines of the Mauritius EconomyK. Poonosamy, Managing Director, Board of Investment, Mauritius
Best Paper Award

Opening Plenary



The Opening Plenary Session was in two parts, starting with a number of high-level presentations from the Host Government, European Commission, African Union Commission and Indian Ocean Commission to provide an overall political context for the **IST-Africa 2014** Conference.

Following a multicultural show, Ms Verna Pillay, Ministry of Information and Communication Technology, Mauritius as Master of Ceremonies for the formal Opening Plenary warmly welcomed the participants, plenary speakers and dignitaries to the **IST-Africa 2014** Conference. With Africa at the forefront of growth and development today, it seems very fitting that this year the IST Africa Conference is hosted in Mauritius. Standing as a small but incredibly potent gateway

to Africa, this island in itself symbolizes the multilateralism that has become characteristic of trade and cooperation to and from Africa today. Verna outlined that it fills Mauritius with hope and excitement to host **IST-Africa 2014** that brings together participants from across Africa and Europe.

Verna welcomed Mr Moctar Yedaly, Head of Information Society Division, African Union Commission, highlighting that the African Union has consistently valorized cooperation across the continent and has breathed life into the synergies of regional grouping across Africa. Bringing down the geographical barriers has meant sharing between economies and sharing between cultures, but perhaps most importantly, it has meant the sharing of knowledge. As the entire world looks to Africa as a bright new world of investment opportunities and of rich resources, we must applaud the African Union for its commitment to innovation, education and research towards development. It is clear that when it comes to the Digital revolution, Africa has certainly not been left behind. With countries like the Seychelles, Mauritius, South Africa, Kenya, Egypt, Tunisia and Rwanda setting the pace, African economies can be widely seen across the world as pulling their weight when it comes to ICT.

Verna welcomed Mr Jean Claude de l'Estrac, Secretary General of the Indian Ocean Commission (IOC), stating the importance to draw attention to the incredible work being done by the IOC in rallying the forces of the Indian Ocean. As island states in the Indian Ocean each is a source of particular strengths, but there is no denying that we will only meet our fullest potential through the regrouping of those strengths and the sharing of our paths towards growth and progress.

Verna welcomed Mr Morten Møller, Programme Coordination, DG CONNECT, European Commission, highlighting the importance of EU support and its ongoing commitment to Science, Technology and Innovation cooperation with Africa.

Verna highlighted that **IST-Africa 2014** brings together leaders in government, industry and research to hone in on some of the most pressing areas in Applied ICT research today: eHealth, Digital Libraries, ICT for Agriculture and Environmental Sustainability, ICT for e-Inclusion and eAccessibility, ICT Regulatory Frameworks, eGovernment and eDemocracy. As the leading African and European brains in ICT converge in Mauritius, Verna reiterated the Ministry's ardent belief that together we will drive this sector forward and together we will step a little closer towards the shining bright future of Africa.

Verna invited Mr. Dan Faugoo, Executive Director, National Computer Board of Mauritius to make the Welcome Address.



Welcome Address by Mr Dan Faugoo, Executive Director, National Computer Board, Mauritius

Mr Dan Faugoo acknowledged Honourable Tassarajen Pillay Chedumbrum, Minister of Information and Communication Technology; Mr Morten Møller, Programme Coordination, DG CONNECT, European Commission, Belgium; Mr Moctar Yedaly, Head of Information Society Division, African Union Commission; Mr Jean Claude de L'Estrac, Secretary General Indian Ocean Commission; Mr. Paul Cunningham, IST-Africa Founder and Coordinator; Mr Vishnou Gondeea, Permanent Secretary of the Ministry of ICT; Mr. Suraj Ramgolam, Chairman,



NCB Board, Distinguished Guests and delegates outlining the privilege and honour for him to welcome all participants to the opening of the **IST-Africa 2014 Conference**. In particular, Dan extended a special welcome to the delegates from outside Mauritius participating in the conference.

The IST-Africa Conference series is one of the key activities of the IST-Africa Initiative, which is a multi-stakeholder Strategic Partnership between IIMC (Ireland), as coordinator, and 18 partner countries from Africa.

IST-Africa facilitates Strategic Engagement in the areas of Information Society, ICT Policy and Research between the European Commission, African countries and key regional organisations. It promotes the participation of African research organisations as partners in the European Commission

Framework programmes, now known as Horizon 2020, which is the European Union's main instrument for funding research.

The National Computer Board, which operates under the aegis of the Ministry of ICT, is the local national partner in the IST-Africa initiative. In this capacity the NCB, in addition to the on-going activities of raising awareness through the circulation of updates on open Calls for Proposals to the Mauritian research community and promoting Mauritius research centres and capacity during international meetings, has also organised several Training Workshops focusing on Framework Programme 7 Calls for Proposals, an IST-Africa Living Lab Workshop and in November 2013 hosted a Stakeholder meeting focused on raising awareness of Horizon 2020.

Dan outlined that NCB is delighted to have reached a significant milestone in their out reach activities with the hosting of the 9th edition of the IST-Africa Conference in Mauritius. NCB is most grateful to IIMC, Mr Paul Cunningham, IST Africa Founder and Coordinator, for having selected Mauritius as the host for the **IST-Africa 2014** Conference.

The 3-day programme combines stimulating key note presentations, high quality technical and policy papers, case studies, interactive workshops and also networking activities with peers. As well as an opening and a closing plenary session, featuring a high level dialogue on Implementation of the Information Society in Africa, the scientific programme incorporates 38 thematically focused parallel sessions featuring eHealth, eInfrastructures, Technology Enhanced Learning, Living Labs, ICT for Environmental Sustainability, eAgriculture and eGovernment to name just a few. In order to ensure completion of this exciting programme, presentations will run in parallel sessions over the 3 days.

Dan outlined that they are also really pleased with the level of participation with over 460 participants from leading Public, Private, Education and Research Sector Organizations from 44 countries. NCB is also very pleased with the level of Mauritian participation and the number of Mauritian researchers who will be presenting papers.

As one of the important outcomes of this conference, NCB is looking to see a significant increase in the number of Mauritian researchers and institutions participating in the future calls for proposals in Horizon 2020. In this context, Dan highlighted the workshop on Horizon 2020 (Session 3a) at 2pm and encouraged delegates who have not been exposed to Horizon 2020 to attend the session. Horizon 2020 is fully open to international co-operation with the aim to jointly address major challenges where significant added value is expected to be gained from a world-wide R&D cooperation. The **IST-Africa 2014** Conference provides the unique opportunity to identify partners and opportunities to co-operate in international ICT research projects co-funded by the European Commission under Horizon 2020.

In conclusion, Dan thanked the Honourable Minister for his presence this morning and the Ministry of ICT for the support and collaboration in the organization of this conference. Dan thanked IIMC, Mr Paul Cunningham and his team, for selecting Mauritius to host the 9th edition of the IST-Africa conference. Dan also thanked all the **IST-Africa 2014** Conference support organisations, namely the European Commission, the African Union Commission, the Institute of Electrical and Electronic Engineers (IEEE), Orange, SAP, FinCeal and Air Mauritius. He wished the delegates a fruitful participation in **IST-Africa 2014** Conference.

European Commission Address by Mr Morten Møller, Programme Coordination, DG CONNECT, European Commission

Mr Møller expressed his pleasure to speak on behalf of the European Commission before such a distinguished audience of policymakers, practitioners, researchers from leading government and research organisations from Africa and other continents.

Mr Møller highlighted that it is common knowledge today that ICT and Innovation has a key role to play in creating sustainable jobs and fostering economic growth. There is a clear correlation between countries with the best rollout of broadband and economic performance. There is also a clear correlation between countries who spend most in research and innovation and economic performance. ICT contributes to economic recovery and long-term prosperity by accelerating growth in productivity. So, a strong ICT component will be required to overcome the challenges that are facing us today, be it youth unemployment, aging or other challenges in Europe, Africa and in the world at large. Being aware of this, the European Commission launched Horizon 2020 in January 2014 as the new Research and Innovation Programme, which will run until 2020. Horizon 2020 brings together the Research Framework Programme, Innovation aspects of Competitiveness and Innovation Framework Programme (CIP), and the EU contribution to the European Institute of Innovation and Technology (EIT) into one programme to boost research and innovation.



Mr Møller outlined that the ultimate aim of Horizon 2020 is to maximise the contribution of EU-funded research to sustainable growth and jobs, and to tackle the grand challenges which are facing the world today such as climate change, clean energy, more efficient transport, food security, sustainable societies, secure societies, health and ageing populations. The Commission Services has created a coherent set of instruments along the entire innovation chain, covering everything from basic research up to concrete, tangible innovation, culminating in bringing innovative products and services to the market and supporting non-technological innovation, for example, in design and marketing. Horizon 2020 is a very broad programme, spanning the whole innovation cycle. It is divided up into three priorities: Industrial Leadership (LEIT), Societal Challenges and Excellent Science.

ICT is a horizontal activity that is included across a number of Work Programmes within LEIT and within Societal Challenges. Within Excellence Science, ICT is included within eInfrastructures, Future and Emerging Technologies and Digital Science.

The Industrial Leadership priority covers Components and systems, Advanced Computing, Future Internet, Content technologies and information management, Robotics and Key Enabling Technologies: Micro- nano-electronics and photonics. There are also ICT cross cutting areas and ICT Innovation Actions.

Societal Challenges aims is to tackle the major societal problems that are particularly acute in today's world and to reflect the EU's goal of achieving a sustainable development and achieve growth and jobs. The aim is through multidisciplinary research and innovation to try and provide real tangible solutions to the problems which we are facing today and there are six areas which the programme will focus on: health, energy, transport, climate, sustainable societies and secure societies, and then food, and the whole area around food.

Mr Møller emphasised that International Cooperation is a cross cutting priority in Horizon 2020. African countries are eligible for funding in cooperation with their European peers. During FP7 there were 104 participants from African organisations under ICT and Research Infrastructures Calls alone with research funding of €4,886,292 going into African institutions.

Mr Møller highlighted ICT-39 which closes on 14 April 2015 focused on targeted collaborative research projects addressing the requirements of end-user communities in Low and middle income countries in sub-Saharan Africa. Specific technological targets could include, for example, co-design, adaptation, demonstration and validation (e.g. pilots) of ICT related research and innovation in relevant thematic areas addressed by Horizon 2020 including Content Technologies and Societal Challenges.

In summary Mr Møller highlighted that there are numerous opportunities for collaboration between Europe and Africa, and invited the participants to continue to work together and strengthen the collaboration. He also highlighted the Horizon 2020 workshop taking place on Wednesday afternoon as an opportunity to learn more details about upcoming calls and ask questions. In conclusion he wished the participants a successful and productive conference.

IOC Address by Mr Jean Claude de l'Estrac, Indian Ocean Commission

Mr Jean Claude de l'Estrac, Secretary General, Indian Ocean Commission (IOC) outlined his delight and pleasure to participate in the **IST-Africa 2014** Conference. The timely presence in Mauritius of researchers, technicians and specialists in information and communication technology (ICT) the rich agenda of the conference bodes well for our continent.

Jean Claude outlined that at the IOC, they believe that this booming sector will play a major role in promoting growth, reducing inequality, creating jobs and adding value to the lives of our people. The IOC is comforted in



this belief by the several studies which have showed that there is a direct link between ICT diffusion and economic growth. Indeed, a World Bank report published in 2009 shows that every 10% increase in broadband Internet connection in developing countries increases economic growth by 1.38%. Also, broadband penetration positively impacts work productivity resulting in a 1.5% increase, according to the U.S. firm Booz & Company. As for the impact on employment, McKinsey outlines in a 2011 study that for every job eroded by the Internet, 2.6 positions are created in and outside the ICT sector. These figures confirm that the spread of broadband Internet constitutes a virtuous circle for developing economies, of which digital infrastructure is the foundation.

For the time being, however, the Indianoceanic Region remains digitally marginalized. The challenge at the IOC is therefore to significantly better the regional digital connectivity through improving infrastructure. The European Union has shown its interest in supporting a regional programme through the 11th European Development Fund. The plan of the BRICS countries (Brazil, Russia, India, China, South Africa) to set up a submarine cable along 34,000

km, through the Indianoceanic Region and with a capacity 10 times greater than the current cables, should allow us to overcome the distance, time and factors costs that affect regional competitiveness. The challenge will be to multiply the input to cable points. And, the realisation of this great project will require the establishment of a digital loop in the Indianoceanic region.

To become a pillar of our economies, the ICT industry should evolve in a competitive environment that stimulates innovation and reduces costs for consumers and operators. The State has a key role to play in adopting and evolving rules, facilitating technology diffusion and access to the Internet in public places. This is exactly what the Mauritian Ministry of ICT is actively doing.

Jean Claude outlined that ICT development is not just about earning points on the growth index or facilitating trade and economic transactions. Technological progress first and foremost shrinks boundaries between countries, reduces distances and expands the horizons of our island countries. But ICT is, also, a strong vector of bringing peoples and cultures together. It is in this sense that members states of IOC have agreed on the establishment of a modern communication tool adapted to our new needs. This instrument shall transmit information as well as contribute to the sharing and promotion of our culture and know-how through the creation of a digital platform.

This multimedia platform – which is currently called “Indocéane.TV” – will undoubtedly be an innovative and iconic instrument of regional integration. It will promote culture and technology, economy and networking, exchanges and training, attractiveness and visibility. Indocéane.TV will showcase the extraordinary cultural and ecological wealth of the Indianoceanic Region as well as the economic ambitions of its member countries. It will also highlight the creative and entrepreneurial potential of women and men in the region.

Jean Claude concluded by saying that the support of partners, in particular the European Union, shows their confidence in the region's capacity to innovate and create a sustainable growth thanks to technological progress. The future of the Indianoceanic region and all the other parts of Africa depends, however, on the commitment of our States to make the financial and technological efforts – as well as educational and legislative – required to achieve a balanced and harmonious development of ICT. It is a prerequisite to the emergence of a knowledge industry conducive to the creation of employment and promotion of growth.

African Union Commission Address by Mr Moctar Yedaly, Head of Information Society Division, African Union Commission

Mr Moctar Yedaly, Head of Information Society Division, African Union Commission thanked the Ministry of Information and Communications Technology and National Computer Board for the warm hospitality accorded to the AUC Delegation since their arrival on the beautiful island of Mauritius.

Mr Yedaly outlined that the vision of the African Union is to build an integrated, prosperous and peaceful Africa, an Africa driven and managed by its own citizens and representing a dynamic force in the international arena. Information Society is an enabler towards the attainment of this vision.

Africa is currently undergoing a revolution in ICT, characterised by a rapid increase in mobile phone penetration, and hence bringing services within the reach of hundreds of millions of people. While there were less than 10 million fixed-line phones in Africa in 2000, there are currently over 1 billion mobile phone subscriptions.

ICT for development is not about computers, mobile phones, and the Internet, but about using them to empower communities for communication, learning, and accessing services. This will lead to improved well-being,

increased work productivity, support for innovation, and provide the impetus for inclusive growth.

Mr Yedaly highlighted that all of us will agree that living in a modern society without ICT is very difficult. ICT has been integrated into every aspect of our business activities and daily lives. At the same time, the digital divide is unfortunately a reality of life in many aspects of development co-operation. Therefore, the search for better ways to maximize the benefit of ICT for development has to go on — we are just at the beginning of the journey.

Bearing this in mind, the African Union Commission has continued to work with all stakeholders and partners to harness the potential of Information Communication Technologies, and to find effective and innovative ways to put this potential at the service of African citizens. Mr Yedaly highlight two recent milestones - firstly on 26th March 2014, Africa finally secured its e-Identity when the registry agreement for the new top level domain of dotAfrica was signed. Africa will now have a unified presence on the Internet with the dotAfrica Top Level Domain promoting African business, peoples and culture in the Internet. African business and individuals will soon be able to pay for their domain names in their local currencies and this will save Africa valuable foreign exchange which currently goes to foreign-owned registries. Africa will now contribute more to the digital economy. The African Union Commission wishes to express its thanks to the African Internet community for the unwavering support for the DotAfrica project through its long journey to its final delegation by ICANN.

Secondly, the African Union Commission has also provided Capacity Building to support the establishment of Internet Exchange Points in 24 African countries. In the last four months, the Commission facilitated the setting up and commissioning of Internet Exchange Points in Namibia, Burundi and Swaziland. The Internet Exchange Points are expected to contribute to a faster, secure and affordable Internet in Africa.

In conclusion, since the IST-Africa Conference facilitates an ICT and Innovation dialogue between Africa and Europe, Mr Yedaly highlighted that Africa's partnership with Europe guided by shared principles of equal partnership and joint ownership continues to be strengthened. The EU-Africa Summit was held from 2-3 April 2014 with the theme on Investing in People, Prosperity and Peace, and the objective of addressing common challenges and bringing concrete benefits to our citizens. During the Summit, it was recognised that on the way to greater economic integration, virtual infrastructures enabled by the new Information and Communication Technologies (ICT) will play a strategic role. The Summit also agreed to further boost the uptake of ICT and the roll-out of an inclusive, open and secured Information Society.

Mr Yedaly took the opportunity to thank the organisers of **IST-Africa 2014** and called on all delegates attending this conference to work towards making a concrete contribution to the advancement of ICT in Africa.

Official Opening Speech by Hon. Tassarajen Pillay Chedumbrum, Minister of Information Communications Technology, Mauritius

Hon. Tassarajen Pillay Chedumbrum, Minister of Information Communications Technology outlined his pleasure to formally open the **IST-Africa 2014** Conference and to welcome all the participants to Mauritius.

IST-Africa is a strategic collaboration between IIMC (International Information Management Corporation Limited, Ireland) and 18 African Member States, namely: Mauritius, South Africa, Botswana, Lesotho, Namibia, Mozambique, Swaziland, Malawi, Angola, Tanzania, Uganda, Kenya, Burundi, Ethiopia, Cameroon, Senegal, Tunisia and Egypt. Founded in 2002, supported by the European Commission (EC) and African Union Commission (AUC) and co-funded under the EU Framework Programme since 2005, IST-Africa is focused on supporting: International Innovation, Research and Policy Cooperation; Knowledge Sharing and Skills Transfer between IST-Africa Partners; Collaborative Innovation, Entrepreneurship & Adoption of Living Labs; Information Society, ICT and Innovation aspects of the Africa – EU Strategic Partnership and Supporting the AMCOST African Science and Technology Consolidated Plan of Action.



IST-Africa 2014 is well focused on key strategic topics, allowing countries within the African region to benefit from regional expertise. To day we all know that the path to progress for ICT in Africa is through regional cooperation and partnerships. **IST-Africa 2014** will therefore focus on Applied ICT research in the areas of eHealth, Technology Enhanced Learning & ICT Skills, e-Infrastructures, Digital Libraries, Future Internet, ICT for Agriculture and Environmental Sustainability, ICT for e-Inclusion and e-Accessibility, ICT Regulatory Frameworks, Living Labs, Mobile Applications, Cloud Computing, eGovernment and eDemocracy. All these issues fall in line with the Mauritius eGovernment Strategy and the Government vision to make Mauritius a cyber island and an ICT leader in the Region. Mauritius was very pleased to host **IST-Africa 2014** as a mechanism to consolidate its position as the ICT leader in the region, to constantly improve and make use of ICT as the main pillar of our economy, with a double digit contribution in our GDP, to learn and improve and ultimately invest in research and development. IST-Africa applies a Train the Trainer philosophy to support Capacity Building and Generational Leapfrogging through Structured Collaboration and Knowledge Sharing between Partner Countries, hence **IST-Africa 2014** provides Mauritius with the Ideal platform to attain its goal and vision.

Mauritius has always been known for its beaches as a tourist destination. However Mauritius has emerged as an international and competitive ICT destination and is steadily positioning itself as a regional ICT Hub, despite the world economic downturn which is affecting the world since 2008. Over the recent years, the ICT sector has experienced a rapid and sustained growth and is gradually emerging. An increasing number of foreign companies are also setting up their bases in Mauritius along with the 600 existing ICT companies which generate some 19,000 jobs to which our highly educated youth aspire to. These companies conduct ICT and ICT-related activities such as software development, call centre operations, business process outsourcing (BPO), IT-enabled services (ITES), web-enabled services, training, hardware assembly and sales, networking, consultancy, multimedia development, disaster recovery (DR) and other support services. Major international ICT players, including Oracle, Microsoft, IBM, HP, CISCO, Orange Business Services, Accenture, Infosys, Hinduja Group, France Telecom, Ceridien, the TNT Group, have already set up their operation and development centres in Mauritius.

In line with its vision to make ICT an important engine of economic growth, the Ministry of ICT launched the National ICT Strategic (NICTSP) in 2011, to move towards what we term as I-Mauritius. The National Broadband Policy 2012 – 2020 (NBP2012) (the policy that sets out a strategic vision for a broadband Intelligent Mauritius), The Open Access Policy for Undersea Cable; Opening of Landing Stations in Mauritius; In 2013, the Mauritius e-Government Strategy 2013 – 2017, and in the pipeline the National Cybersecurity Strategy, echoes Mauritius's commitment and endeavours in driving the ICT sector forward.

The Government of Mauritius has a long-term vision and is fully conscious of the key role which the legal framework has to play in ensuring a healthy and sustainable development in the ICT industry. In this perspective, appropriate legislations have been enacted to encourage the effective growth of the ICT sector, namely the: Copyright Act; Electronic Transaction Act; Information and Communication Technologies Act; the setting up of the ICT Authority; the ICT Advisory Council, and the ICT Appeal Tribunal is pursuant to the adoption of this Act; Computer Misuse and Cybercrime Act, and The Data Protection Act.

The Minister highlighted that according to the latest World Economic Forum's Global IT Report 2014, Mauritius has moved up 7 points to occupy 1st place in Africa and globally holds the 48th place in information technology. On the other hand Mauritius moved up by nine places to the 45th place out of 148 countries in the 2013-2014 Global Competitiveness Report, released by the World Economic Forum (WEF), hence becoming the highest ranked country in Sub-Saharan Africa. Furthermore, Mauritius improved its Networked Readiness Index score from 4.06 in 2012 to 4.12 in 2013. With such a score Mauritius is not only first in the sub-Saharan Africa in 2013 but for the whole of Africa.

The other benchmark is the ICT Price Basket (IPB) published by the International Telecommunication Union (ITU) which tracks the cost and affordability of ICT services. Mauritius, with an IPB note of 1.2, tops Africa for the prices of ICT services offered and ranks 4th among upper middle income countries. Other yardsticks pertaining to the prices of fixed broadband or mobile broadband, also places Mauritius at the apex on the continent.

The figures, facts and reports speak for themselves as to the transformation that Mauritius has undergone in the field of ICT. The radical change has been due to hard work and a vision for the country.

The Minister believes that there is a solid foundation in the ICT sector, and as a consequence, the country can move to the next stage to consolidate this growth by focusing on Research & Development.

The Government of Mauritius is aware that knowledge provides powerful means to create wealth and improve the quality of life of people. Future economic progress will be driven by innovation, invention and application to new technologies. Recently the Government has voted for the Mauritius Research Council (Amendment) Bill. The mission of the MRC has been redefined and oriented towards innovation which is a key enabler to modernise the country.

The Minister concluding by stating that we need to innovate not only to be ahead of our competitors but also to lay a conducive environment for our young generation to bring their share towards the economy. He reiterated his honour and pride to be the Host of such a high profile Conference and commends IST-Africa for its unflinching commitment towards the Information Society in Africa. He wishes the delegates a fruitful conference.

High Level Roundtable on the Implementation of the Information Society in Africa

Paul Cunningham, IST-Africa Coordinator welcomed the panelists and participants to the High Level Roundtable on the Implementation of the Information Society in Africa.



Paul introduced the panelists including Zauria Saifodine, Director of ICT Capacity Building, Instituto Nacional de Tecnologias de Informação, e Comunicação, Mozambique; Dr Hemant Chitto, Ag. Director General, University Technology Mauritius; Dr Arjoon Suddhoo, Executive Director, Mauritius Research Council; Mactar Yedaly, Head of Information Society Division, African Union Commission; Dr Krishna Oolun, Executive Director, ICT Authority, Mauritius; Prof Romeela Mohee, Vice-Chancellor, University of Mauritius; Mr N. Jugmohunsing, Assistant Permanent Secretary, Ministry of Tertiary Education, Science, Research and Technology, Mauritius; Prof Darelle Van Greunen, School of ICT, Nelson Mandela Metropolitan University, South Africa and Mr Suraj Ramgolam, Chairman, National Computer Board, Mauritius

and invited the audience to give them a warm welcome of applause.

Paul outlined that the Roundtable would take the format of short interventions around a number of agreed talking points aligned with the Research and Innovation, STI and ICT aspects of the Joint Africa – EU Strategy (JAES) Roadmap 2014 – 2017, which was agreed at the EU-AU Summit in Brussels a few weeks ago. This Roadmap recognises the importance of taking “an integrated approach recognising the important cross-cutting nature of innovation/entrepreneurship, research infrastructures and technical skills development in Africa and Europe” [Section 31] and as well as “implementation of a three-pronged ICT for Development Strategy “Connecting Africa” [Section 50].

Progress in implementing the Information Society and Knowledge Economy in Africa and the role of Research and Innovation leveraging ICT

The Roundtable commenced by discussing Progress in implementing the Information Society and Knowledge Economy in Africa and the role of Research and Innovation leveraging ICT.

Paul invited **Mactar Yedaly, Head of Information Society Division, African Union Commission** to provide the first intervention. Mactar Yedaly commenced by recognising the participation of the officials from the Regional Economic Communities and Associations of Regulators and Telecoms operators who have been working with NEPAD and the African Union Commission since Monday on building the coherence of the ICT Strategy for Africa and aim to come up with a final document by Friday which addresses infrastructure, Research, Development and Innovation. The African Union Commission believes in using ICT to transform Africa and there have been good developments in terms of the enabling environment over the past five years with improved connectivity with the rest of the world. Connectivity is being addressed at both the Regional Economic Community level and through NEPAD Programmes, to address the strategy for inter-connectivity and cross-border connectivity, with good progress in Southern and Central Africa. Broadband connectivity is the tool/platform to be used for any kind of research and innovation. Without good connectivity it will be difficult to develop the National Education Research Networks (NRENs). The Virtual University is now operational and provides a mechanism to support scholarships for young Africans. In terms of policy and regulation, the voice market is okay and there is a good level of commitment from the Member States in relation to remaining policies and regulation necessary to support transformational applications, provide a favourable environment to build confidence in using ICT for electronic transactions and address cyber security.

Moctar outlined that next Monday (12 May) the Conference of African Ministers in charge of Justice will be considering the first African Union convention/framework on Cyber Security, Personal Data Protection and Electronic Transactions. In June this will be proposed to the Head of States and once it is approved by Head of States, the ratification process will commence to operationalise the convention. This is an important milestone.

Moctar then highlighted that Internet Governance is an important issue that needs to be moved forward. It is important that all relevant stakeholders (public sector, private sector, research and Higher Education sectors, civil society) actively participate in this dialogue. In conclusion Moctar confirmed that African Member States have made good progress in implementing the Information Society and the role of Research and Innovation leveraging ICT over the past five years.

Paul thanked Moctar for this insight and invited **Zauria Saifodine, Director of ICT Capacity Building, Instituto Nacional de Tecnologias de Informação, e Comunicação, Mozambique** to provide a government perspective.

Zauria Saifodine outlined that the Government of Mozambique has been working on developing policies, strategies and implementation plans focused on development of the Information Society since 2000. Due to this work, good improvements have been realised in mobile telephony subscriptions with the level of competition in this area having increased with three cellular providers and an increase in the number of householders with Internet access. There is good connectivity across the country via a fibre optic network, which has assisted in reducing the costs of Internet access and links to international networks via EASSy and SeaCom. A number of eGovernment Services are currently provided at stage 2 and with good progress being made towards Stage 3 to provide interactive services to citizens. There are a number of capacity building programmes ongoing to provide citizens with computer literacy skills so that they can access services online. It is clear that the Government is concerned about putting the necessary regulation in place to ensure that citizens can access services online securely. A Transaction Law that has been designed and it is planned that it will go to Parliament during 2014 for approval. There are also regulations that are planned to ensure that the proper environment is in place to fully benefit from the use of ICT.

Paul thanked Zauria for outlining the progress in Mozambique towards realising an Information Society and invited **Prof Darelle Van Greunen, School of ICT, Nelson Mandela Metropolitan University, South Africa** to provide a research and education perspective.

Prof Darelle Van Greunen provided an insight into activities supported by the South African Government. The first ICT Roadmap Strategy was put in place in 2007 with a view to leading up to 2015. Last year it was revised and a new ICT Roadmap Strategy adopted in December 2013. Looking at the long-term investment outlined in the 2007 Strategy to a large extent this has been achieved but it depends on which perspective you are looking at it from. Coming from an academic perspective and a Higher Education environment, Darelle outlined that they are heavily dependant on ICT in order to do many different things, not only teaching students ICT in the curriculum but also to reach out to a broader community base. Darelle highlighted a few issues that come to mind listening to Moctar's comments that the AU has done well including escalating broadband costs and high telecommunications costs. It would be desirable for Africa as a continent to have a business model to deal with cross-border roaming, reduction of telecommunications costs and speed of access on the ground. In terms of Internet confidence and eGovernment service provision, one of the success stories in South Africa is that of the Revenue Services, with well developed IT systems (Stage 3 heading for Stage 4) but a lot of other services are lagging behind. Darelle asked that if we want to implement the Information Society and Knowledge Economy, have we taken enough steps to humanise IT? In other words do people understand what is in it for them if they buy into this Knowledge Economy and Information Society? Are we placing too much emphasis on some things and to little on other items?

Paul thanked Darelle for this insight.

Moctar Yedaly followed up by acknowledging that there is an awareness of the frustration associated with telecommunication and roaming costs that was raised by Darelle and key stakeholders are working together to identify solutions to these challenges. Current obstacles include that private sector telecoms operators were issued with individual national licenses in the 1990s that did not stipulate a provision for roaming. Governments now need to put provisions in place to address roaming charges when new licenses are being renewed. Costs are high due to interconnectivity using submarine cables.

Paul then invited **Dr Hemant Chitto, Ag. Director General, University Technology Mauritius** to provide a local insight.

Dr Hemant Chitto outlined that Mauritius is one of the top performing countries in Africa, for example the eReadiness Index. UTM has been very proactive in developing 5 Masters Programmes, 12 undergraduate

programmes and 3 diplomas to proactively provide the market with a skilled and knowledgeable man power required to contribute to the Information Society and strengthen the ICT Industry. Based on past statistics, it was clear that Mauritius would require around 20,000 IT professionals, of which UTM has supplied up to 2,000 skilled professionals to the market. 82% of the graduates have secured jobs in the relevant field of their studies. The University has also contributed to the Information Society through quality research including 5 PhDs in ICT and ICT related fields with 10 MPhils. The University also collaborates with the top ICT companies in Mauritius such as Orange/Mauritius Telecom and partners with the University of Cape Town and SAP. The SAP syllabus is included in the curriculum of programmes to bridge the skills gap. UTM is going to become a centre for short training courses on SAP and other IT suppliers.

Paul thanked Hemant for his insight and invited **Prof Romeela Mohee, Vice-Chancellor, University of Mauritius** to provide both a national and regional perspective.

Prof Romeela Mohee outlined that the University of Mauritius is now 49 years old, having started as a College of Agriculture 100 years ago in August. There are several departments at the University dealing with ICT with the major one being the Department of Computer Science, which has existed for about 25 years and has around 46 academic staff members. It is hoped that it will soon become a Faculty of Computer Science. Out of these academic staff, more than half have PhDs and UoM trains about 3,000 students across 50 undergraduate and PostGraduate courses in ICT ranging from software, ICT, web, multimedia, hardware engineering, electronic engineering etc. The academic staff is involved in applied research. UoM has trained over 42,000 graduates in Mauritius, with around 7 - 8,000 graduates in the ICT field, who are now in major positions in Mauritius and abroad. UoM tries to get serious graduates that are ready for the market place.

Paul thanked Romeela for providing this insight and invited **Mr Suraj Ramgolam, Chairman, National Computer Board, Mauritius** to provide his insight.

Suraj Ramgolam outlined that **IST-Africa 2014** is the first time that Mauritius has hosted such a large conference with some many stakeholders from abroad alongside national stakeholders and this provides a wonderful opportunity to foster innovation and build linkages for future projects. Suraj agrees that there is a lot of progress to be made in terms of building the Information Society and to build the necessary infrastructure. Internet penetration in Africa is still low and the cost of connectivity is high. Legal and regulatory frameworks still need to be developed further to build an inclusive Information Society. But it is also important not to lose sight of what has been achieved over the past four years, with Internet bandwidth increased 20 fold and 750 million mobile subscriptions in Africa. The contribution of ICT to the GDP of African countries is 7%, more than the global average. Africa is making progress in terms of implementing a Knowledge and Information Society. The performance of Sub-Saharan Africa in the recent World Economic Forum report shows the ranking of Mauritius and South Africa has improved dramatically. Mauritius has transformed from an agricultural based economy over the past 40 years to a stage where now 70% of the GDP contribution is the services sector and ICT is the third pillar of the society contributing 7% of the GDP (20,000 in terms of employment). A lot of progress has been made in terms of the Information Society with an Internet and PC penetration of 50%, with computer clubs and WiFi facilities set up across the island and the Government has pledged to make Internet connectivity a basic citizen's right. Mauritius has seen improvements in terms of Internet bandwidth over the past two years. Mauritius, like South Africa, has gone through a number of national ICT strategic plans with the first one in 1990, then 2007 - 2011 and 2011 - 2014. These types of forum help us to better understand the environment and different perspectives.

Paul concluded this point by highlighted that our expectations of ourselves is higher. We have reached a level that 10 years ago we didn't believe could be achieved and now that it has been achieved, we want to go higher. Africa is now the number one region outside Europe in terms of successful participations in FP7, with over €200 million in research funding.

eInfrastructure

Paul then invited the panel to discuss ***"How does improved eInfrastructure in Africa (and concrete developments such as AfricaConnect, African Internet Exchange System (AXIS), Progress on developing African national and regional research & education networks (NRENs) and their interconnection to European GÉANT2 network) support the transformation of education and research cooperation?"***

Moctar Yedaly outlined that the African Union Commission is currently supporting the implementation of Internet Exchange Points in 24 countries that did not have these systems in place with the aim to ensure that local traffic stays local. Without national Internet Exchange points, ISPs within the same country that wish to interconnect need to go back to the European or US networks, which impacts on the cost and the quality of the communications. 600 million USD is currently spent in Africa for interconnectivity. Moses Bayingana is making a detailed presentation on the AXIS project (African Internet Exchange System) in the Closing Plenary on Friday.

In relation to research education networks, there are good examples with the Pan African Network, which has supported 12,000 Masters Students. In terms of capacity building, the ALICT programme supported by the Finnish Government has trained over 600 middle managers within Ministries responsible for Science and Technology / ICT to ensure that ICT is being factored into decision making and planning.

In relation to connectivity, at international level, ICAN was given each region a number of IP addresses to be managed for the region (Europe, Asia, America and Africa). There are institutions that are managing the IP addresses for Africa and it is necessary to ensure that the IP addresses are being well managed for socio-economic transformation - to interconnect and communicate. This is important in the context of moving from IPv4 to IPv6 and Internet of Things.

Paul thanked Moctar and invited **Zauria Saifodine (INTIC)** to comment from the perspective of developments in Mozambique.

Zauria Saifodine outlined the importance of being able to connect networks of researchers in Africa with networks of researchers in Europe to benefit from skills and systems that are already in place. One of the main sources of income in Mozambique is from prawns and it is necessary to know what problems are emerging in the sea ecosystems that may have an impact in the future. It is not possible to track these trends without systems and it is necessary to link with networks of researchers who are following these issues. Being able to interconnect networks provides a fantastic opportunity to share knowledge, research and improve the quality of education.

Paul thanked Zauria and invited **Prof Romeela Mohee (UoM)** to provide her perspective.

Prof Romeela Mohee focused on the national and regional education networks as this is something that she has been involved in from some time in other sectors. There are a number of initiatives ongoing in terms of collaboration and there are now opportunities for research collaboration under Horizon 2020, which provides a wonderful platform for research collaboration and to leap frog into the future. Challenges for African researchers include a lack of knowledge about work ongoing within the same country within specific fields - there is a need to have a national database for researchers to register their interest, ongoing research activities, collaborators and support team building to bid for research projects. Intellectual Property rights, Knowledge Transfer and Sustainability need to be clearly addressed at the start. By linking up with networks like GEANT and IST-Africa, they are fundamental building blocks that can ensure the sustainability beyond the project work.

Paul picked up on two points raised by Romeela. One of the strengths of the Framework Programme (FP7 and Horizon 2020) is that the European Commission as the funding agency does not take ownership of Intellectual Property created by the funded collaborative research project. There is a Consortium Agreement - a legal framework which must be put in place prior to commencing the European funded project, which outlines rights, ownership of IPR, access rights, foreground and background knowledge and ownership of outputs of the research. The basic principles of who owns the IPR are agreed within the Consortium but in general the default position is that those partners who created the Innovation own the Innovation. So there may be a case where there are 12 partners in a project but if only 2 partners create the Innovation then they own the Innovation. Typically what is agreed within the Consortium Agreement is that the other 10 partners will enjoy license free rights to use the Innovation, thus benefiting from the project outputs. There is a Horizon 2020 Workshop this afternoon to provide more details on opportunities for collaboration and ask questions. In relation to national databases of research ongoing, MRC for example is in a good position to know who is undertaking research in Mauritius as one of the national funding agencies. Paul highlighted that within IST-Africa, we have launched a project and organisational repository to assist in identifying projects funded under FP7 with European and African partners from IST-Africa countries and participating organisations. You can see what projects different organisations were involved in and organisations that they partnered with. We have agreed with a number of funding agencies in Africa that they will also contribute their project data to this repository so we can extend the links and highlight partners involved within a one stop shop.

How can Innovation be better supported to ensure faster take up of co-created products and services?

Moving to the next topic for discussion **Paul** outlined that over the last five years, Africa has experienced a dramatic increase in ICT-related Innovation with the emergence of both independent and university based Innovation Spaces (e.g. Pre-Incubators, Incubators, Accelerators, Entrepreneurship Centres) supporting Technology Entrepreneurship. Paul invited the panel to discuss how Innovation can be better supported to ensure faster take up of co-created products and services, in both the public and private sector that meet African needs out of the box, i.e., co-created products and services based on local needs? What are the implications for potential policy changes?

Paul invited **Moctar Yedaly (AUC)** to kick start the discussion. Moctar outlined that policy changes that are

required include Internet Governance (to ensure openness to Internet of Things) to support African leadership in IT; better support to Research and education; and policies that recognise that eApplications are the key for transformation.

Paul thanked Moctar and invited **Prof Darelle Van Greunen (NMMU)** to comment.

Prof Darelle Van Greunen outlined that in South Africa there is a number of universities that have research groups in ICT and slowly but surely there are international companies who are expanding their research presence and research labs in the country. There are quite a number of incubators and entrepreneurial development programmes available in South Africa. In general we are heading in the right direction but there are still concerns in relation to the pipeline of human capital being developed, the scarcely focused areas and lack of coordination between the institutions. Universities can be quite territorial in their research endeavours. In South Africa there are government laws that govern Intellectual Property protection. South Africa spends approx 10 percent of GDP on ICT goods and services, of which most are being imported into South Africa. R&D intensity has stabilised around 0.92% but it is still below the global norm of 2%. South Africa spends double what other BRIC countries spend on ICT as a percentage of GDP. Part of the reason is the South African Government has earmarked 9 billion rand for R&D in ICT but if this is measured against countries like Brasil they spend four times what South Africa spends on ICT R&D, Taiwan and Korea spend ten times what South Africa spends on ICT R&D - proportionally there is a big of a problem and this puts other countries in the lead in terms of Innovation as they have the funding to do this. South Africa leads the way in Africa in specific areas but needs specific policies to encourage and reward Innovation - this is currently lacking at the moment. Another challenge is the level of bureaucracy and red tape around Innovation when you want to file patents.

Paul thanked Darelle and invited **Dr Arjoon Suddhoo, Executive Director, Mauritius Research Council** to provide insight into the situation in Mauritius.

Dr Arjoon Suddhoo started by discussing what is meant by Innovation in different countries. To innovate at a global level is wonderful, but to innovate within one country can lead to a whole nation having a better quality of life. Darelle talked earlier about humanisation of IT and Arjoon said that he is a great believer in this. While acknowledging that Infrastructural requirements at country level is important, Arjoon made a case that there are also other less tangible items that directly impact on the ability to innovate that can improve the quality of life. To take us into the next phase of Innovation that Paul referred to as the crest of the next challenges, tangible infrastructure alone is not going to solve this. We are dealing with a multicultural environment as is recognised in management training in multinational organisations and MBA courses (managing Innovation in a multicultural context). However, in Africa where there are a plethora of cultures, tribes and languages that are not found anywhere else in the world, are we capitalising on this in transforming it into Innovation? Relationship building among scientists and countries has not yet been achieved in Africa - this is the next challenge to be addressed - to get to know who is doing research within our country and neighbouring countries. In Africa there are a lot of experienced people but older people tend to be computer illiterate and young people who are highly computer literate but lack the necessary experience. We often hear of young people from UK or other countries that come up with a great application that has generated a lot of money. We need people to innovate, to get together but the young people in Africa need Science, Technology and Mathematics. What should we equip our young people with from the education side so they can become Innovators? Yes, they need to communicate with others, but at school level the teaching of science and maths needs to be emphasised and encouraged. In many African countries, the number of students taking science and maths is decreasing which is worrying in the context of future research and innovation. The human aspect is very important - who are the people who will innovate in the future and what skills will they need? We often measure the innovative capacity of a country by the number of patents but patenting can also be a hindrance to innovation. People often say that you need to stand on the shoulders of giants to innovate - yes it is true that we need to use what other people have found as part of the Innovation life cycle but if the shoulder of this particular giant has a patent on it, I cannot use it.

Paul thanked Arjoon and invited **Dr Hemant Chittooo (UTM)** to comment.

Dr Hemant Chittooo outlined that UTM as a University has put an Incubator in place with the help of the National Computer Board. Several students have had the opportunity to get business support when developing ideas in the areas of Cyber Security, graphic design, printing, security camera and database companies. Both in the incubator and in many of the ICT programmes being offered, entrepreneurship is included as a compulsory module (how to set up a company, create a business plan etc). There are also business angels sessions. Universities should move one step further to adopt the mentoring model (brainstorming, supporting business plan development, fund raising etc) to support university graduates to become entrepreneurs. Staff are advising companies in relation to how to grow.

Paul thanked Hemant and outlined that there are not enough employment opportunities in the public and private sectors for all the graduates coming out of Universities across Africa. There is a need to drive entrepreneurship

across Africa to get people out of the informal economy into the formal economy, not to drive the tax base but it is clearly recognised internationally that if you establish an SME (Small and medium size enterprise) not only will you create a minimum of three to five jobs within that entity but there will be a further ten to fifteen jobs that will be created around that entity. Paul invited **Prof Romeela Mohee (UoM)** to comment.

Prof Romeela Mohee agreed that Incubators alongside mentorship is a good way to support Masters and PhD students with the necessary legal, financial and entrepreneurial skills. Industry needs to exist in proximity with the Incubators as the model to be followed.

Paul thanked Romeela and outlined that this is the model that countries like Kenya, Swaziland and Tanzania are exploring around the building of an Innovation city/Science Park and designing Incubators and Accelerators as components from the start. Part of the pre-condition for bringing in multinationals could be that they agree to be mentors for local entrepreneurs. This would provide a strong model.

Paul invited **Suraj Ramgolam (NCB)** to comment.

Suraj Ramgolam indicated that Dr Arjoon Suddhoo has provided a good presentation on the challenges being faced in Africa in terms of Innovation. Suraj agrees with the need to humanise IT. There is a silent revolution ongoing in relation to Innovation - for example the adoption of mobile payments (mPesa) in Kenya to improve the quality of life for citizens and in relation to the cost of infrastructure, the ongoing development of the Ubuntu Linux operating system by Africans for Africans and the use of innovative ICT tools in the field of medicine in Mali. The Internet is a perfect equaliser and provides opportunities for everyone to innovate and create products.

Paul thanked Suraj for his insight.

Regulatory Environment

In the context of ICT-enabled services with cross-border potential and the need to continue supporting both national and regional Innovation (including challenges such as CyberSecurity, Internet Regulation and Open Data), Paul invited the panel to discuss how the demands on the Regulatory Environment can be best addressed.

Paul invited **Dr Krishna Oolun, Executive Director, ICT Authority, Mauritius** to kick start the dialogue.

Dr Krishna Oolun outlined that with trans-border services it is necessary to bear in mind that regulators can only do what the legislation at national level allows for. Researchers think from the mind set of how they can innovate, share and make things happen but at the end of the day find that this freedom of thought can be hampered at a higher decision making level. It is necessary to address this at policy level for the region. We talk about the world being a global village from a technological perspective but then when we look at economics and other paradigms there are other factors at play. Technology has no barrier, no frontier. The frontier is cultural and economic - these are the kind of things that need to be addressed at a regional level and taken up at a high policy level within the region. Once we have those policy decisions taken, we will have the enabling text in our law which the regulator can then make happen. Regulators need to have a different mind set with the changing world using open data, an Information Society and a Data Society. Data will be making the upward thrust as very often when we talk about ICT development it is mainly a top down approach - we also need to think about what people would wish to do with ICT rather than just what the government would like to enable people to be able to do. There needs to be a People - Citizen centric development. In terms of open data, it is necessary to make sure that people can share data and just uplift all those barriers and let the policy makers decide a policy for the region.

Paul thanked Krishna for this insight and invited **Dr Arjoon Suddhoo (MRC)** to comment.

Dr Arjoon Suddhoo outlined that there is this misconception that technology is this great equaliser - in theory this is true but we all know in practice that the digital divide is there and is getting bigger. There is no free lunch in this world - open source are not free and have associated cost needs to be borne in mind.

Paul thanked Arjoon for his insight.

Skills Gaps

There is a significant skills gap in many countries (in particular in the area of 21st Century Skills such as STEM as well as analytical, business and ICT skills). There are different views in relation to whether there is a mismatch between the capacity of graduates and the requirements of both public and private sector employers. Paul invited the panel to discuss concrete actions that can be taken to better align third level curricula (including a commitment by HEIs to support entrepreneurship and engage with local communities through Action Research) to attract necessary FDI (Foreign Direct Investment) and accelerate the development of the Information Society and Knowledge Economy in Africa.

Paul invited Moctar Yedaly (AUC) to kick off the discussion, followed by Zauria Saifodine (INTIC), Dr Arjoon

Suddhoo (MRC), Prof Romeela Mohee (UoM), Dr Hemant Chittoo (UTM), Mr Rishi Jugmohunsing, Assistant Permanent Secretary, Ministry of Tertiary Education, Science, Research and Technology and Prof Darelle Van Greunen (NMMU).

Moctar Yedaly (AUC) outlined that there is a skills gap in the ICT area, with a big disconnect between the public sector and private sector. There is a need to set up the correct interactions between stakeholders to ensure that each one has a clear role.

Zauria Saifodine (INTIC) outlined that in Mozambique there have been many attempts to adjust the curriculum to meet industry requirements but the graduates still do not have the appropriate skills to get proper jobs. This is because when the curriculum are adjusted by the Universities there is no interaction or coordination with the organisations who are going to employ the graduates. The Government has to take a role of engaging with industry when the curriculum are being redesigned so they can participate in the process to make sure the graduates have relevant skills. There are quite a lot of ICT initiatives needs but we do not have the appropriate skills to make sure that they are carried on in a proper way.

Dr Arjoon Suddhoo (MRC) outlined that based on his experience working in the private sector one of the basic mistakes that we are making when looking at the skills gap issue is that the private sector does not move at the same speed as traditional teaching universities. To mount a course in a traditional university involves a lot of obstacles starting with consultation with the private sector, departmental meeting, faculty meeting and eventually it can be approved after one or two years. This is far too long for the ICT sector. Arjoon suggests that Continuous Professional Development (CPD) - short courses - is a better way to go but we need people who have the ability to learn. It is necessary for Universities to teach people how to learn so they can then avail of CPD for continuous upskilling. The model needs to be revisited.

Prof Romeela Mohee (UoM) outlines that the University of Mauritius and a lot of other universities plan their courses with the private sector. There are a number of platforms and advisory committees, students spend six months working with industry, guest lecturers from industry and at the end of the day they would like industry to come and explain their intricacies. Romeela agrees that Universities cannot move at the same speed as the private sector. The mandate of a University is to provide a basic foundation of courses and try to inculcate adaptability, flexibility in the minds of the students. The graduates should be able to think outside the box based on this foundation. There has been a discussion for a long time that there is a mismatch but in the case of UoM the students get jobs and foreigners come to Mauritius and work very quickly with the private sector without their University in another country having undertaken a consultation with the private sector in Mauritius. The private sector need to undertake an induction to familiarise new employees with the technologies they are using on a day to day basis.

Dr Hemant Chittoo (UTM) outlined that Universities should not just be teaching but also teaching people how to learn. It is necessary to develop the culture of learning. Hemant confirmed that in the case of UTM the programmes are also developed in consultation with industry and are revised from time to time. There are a few programmes that have been developed for specific companies. The private sector is also sponsoring labs where the students have hands on experience of their technologies. There are plans from next year that all full time students will have to spend six months with industry at the end of their second year as a mechanism to address the skills gap issue. Universities could also move away from an examination orientated assessment and focus on more practical skills and project based assessment as learning for life.

Mr Rishi Jugmohunsing (Ministry of Tertiary Education, Science, Research and Technology) focused on the global picture of skills gaps. Large companies and SMEs are finding it difficult to get skilled resources based on recent statistics. Based on the Ernst and Young Survey on Higher Education in India (2013), 75% of ICT graduates are considered to be unemployable. While 72% of education institutions considered recent graduates ready for work, only 42% of employers agreed. Half of today's jobs that did not exist 25 years ago require specialist skills - things are changing rapidly. Most Universities are adjusting their programmes to be more skill orientated to make graduates more employable. There are many things going on to support diaspora professionals to return to Africa after their studies abroad. The World Bank is going to finance 19 University based Centres of Excellence in 7 African countries (West and Central Africa) to tackle this serious shortage of skills. Since 2012 in Mauritius, all public institutions must have a consultative committee between academia and industry to ensure that programmes developed reflect the needs of the country. Certified courses can also be used to re-skill graduates based on specific gaps. Education institutions that wish to bridge this gap or address specific skills can provide courses online to support entrepreneurial studies (such as Open University of Mauritius).

Prof Darelle Van Greunen confirmed her agreement with Prof Romeela Mohee's comments in relation to academia and industry mapping. Often when industry is asked to provide input, they do not know what they want. We live in a holistic world and ICT is not in a silo - it is a horizontal enabler and we will only succeed if we have partnerships between academia and industry but also across African countries in order to move forward.

Conclusion

Paul thanked the panelists for their insights and stimulating conversation and invited Moctar Yedaly to close the Roundtable Discussions.

Moctar Yedaly thanked the audience for listening to the fruitful discussions of the panel. In summary Africa is doing well in terms of connectivity but there is still a long way to go. We need to emulate and develop projects such as African Leadership in ICT, Open Africa for Telemedicine, and the AXIS project. Each country needs to have a strategy for development of incubators to ensure that the country can leverage the benefits of ICT. There is a need to continually develop policies that support regional Innovation and that the private sector provides the necessary information to Universities so they can collectively address the skills gap.

Paul thanked the panelists and the delegates for their participation.

Scientific Programme

The Scientific Programme incorporated 38 thematically focused parallel sessions featuring different aspects of International Cooperation, eHealth, eInfrastructures, Technology Enhanced Learning and ICT Skills, Living Labs, Digital Libraries, Mobile Applications, ICT for Environmental Sustainability, eAgriculture, Societal Implications of Technology and eGovernment. The sessions were well attended with a good level of discussion and knowledge sharing. All published papers will be available in the IST-Africa Paper Repository in late June.

IST-Africa and CAAST-Net Plus organised a joint **Horizon 2020** Workshop on Wednesday afternoon. Mr Morten Møller, Programme Coordination, DG CONNECT, European Commission provided a more detailed presentation on Horizon 2020 and highlighted the ICT-39 International Cooperation Call that closes in April 2015. Constantine Vaitsas provided an overview of the role of National Contact Points in Horizon 2020. George Essegbey and Melissa Plath provided an overview of the thematic areas and Calls within Societal Challenge 1: Health, demographic change and wellbeing, Societal Challenge 2: Food Security, Sustainable Agriculture and Forestry, Marine and Bioeconomy and Societal Challenge 5: Climate Action, Environment, Resource Efficiency and Raw Materials. Paul Cunningham provided an overview of areas included within the Leadership in Enabling and Industrial Technologies (LEIT) Work Programme, which includes Components and systems, Advanced Computing, Future Internet, Content Technologies and Information Management, Robotics, Micro-nano Electronics and Photonics. It is important to remember that in Horizon 2020 ICT is horizontal and is therefore included in the LEIT and Societal Challenges Work Programmes. Paul provided more information in relation to ICT-39 Call focused on International Partnership building in Low and Middle Income Countries and 2015 Calls in the other areas of LEIT. Miriam Cunningham provided an overview of Horizon 2020 Participation Rules and Instruments and Paul outlined the steps involved in preparing a proposal and associated budget. This session was very well attended and was interactive in style with a lot of questions and discussion. There were quite a lot of African National Contact Points in attendance at the workshop and they introduced themselves so that delegates can follow up with them during the event in relation to including partners from their respective countries in upcoming Calls.



Paper sessions on Wednesday afternoon included Technology-enhanced Learning, Mobile Applications and eGovernment.

On Wednesday evening there was a Networking Reception supported by IST-Africa and FinCEAL, followed by the Conference Dinner supported by the Ministry of ICT Mauritius to facilitate in-depth networking and partnership building.

The Scientific Programme on Thursday incorporated tracks on eHealth, International Cooperation, eInfrastructure, Cyber Security, Digital Libraries and Societal Implications of Technology showcasing ongoing research being undertaken in Africa and Europe.

The **IST-Africa Workshop** showcased **ICT Initiatives and Research Capacities** in Mauritius, South Africa, Botswana, Swaziland, Namibia, Lesotho, Malawi, Mozambique, Angola, Tunisia, Egypt, Senegal, Cameroon, Kenya, Uganda, Burundi, Tanzania and Ethiopia to raise awareness of ongoing activities and to promote national

institutions with capacity to participate in upcoming LEIT and Societal Challenges calls under Horizon 2020. This mapping of research expertise to Horizon 2020 areas provides input into the planning for future Work Programmes. Delegates took the opportunity to ask the IST-Africa partners for more details in specific areas of interest.

The **"Tablet Integration into the Classroom: A Case from the Rural Trenches" Workshop** was an interactive session using tablets to introduce the Teacher Professional Development component of the ICT for Rural Education Development (ICT4RED) initiative, a running project in South Africa. This specific module is one of a 10 module course that was presented to demonstrate how the ICT4RED Initiative have successfully facilitated ICT tablet integration in the classroom by teachers with little or no exposure to ICTs. Delegates were able to interact with the tablets and learn more about how the teachers were trained to use ICT in the classroom.

The **"Exploiting Infrastructure for Research and Education" Workshop** focused on Research and Education Network (REN) Infrastructure Rollout in Sub-Saharan Africa and Enabling Communities of Practice with presentations from UbuntuNet Alliance, AfricaConnect/DANTE, WACREN, African Virtual University and SKA. UbuntuNet Alliance is a regional Research and Education Network with National Research and Education Networks (NRENs) in 14 countries (DRC, Ethiopia, Madagascar, Kenya, Malawi, Mozambique, Namibia, Rwanda, Somalia, Sudan, South Africa, Tanzania, Uganda and Zambia). The UbuntuNet Alliance Network has two points of presence in Europe - London and Amsterdam and six new points of presence in Africa created under the AfricaConnect project - Mtunzini, Maputo, Dar es Salaam, Nairobi, Kampala and Kigali. There is now 1 STM-4 Link from the Nairobi Point of Presence to Europe (created under AfricaConnect), three NRENs are connected directly to London through their own links - KENET (Kenya), TENET (Tanzania) and MoRENET (Mozambique) and KENET and TENET are also connected directly to Amsterdam through their own links. ZAMREN (Zambia) is connected to South Africa through TENET. The motivation for AfricaConnect was to interconnect all African NRENs with each other and to the rest of the world through GEANT, exchange African internet traffic in the Africa continent and to facilitate African researchers, scientists and students to communicate with the world without bandwidth limitations. It was launched as a four year project (May 2011 - 2015) with a total contract value of 14.95 million euro, funded by DG DEVCO at 80% and African partners at 20%, supported by ACP and AUC with DANTE as the contracting partner and UbuntuNet Alliance as the managing partner. It was designed in four phases with the first phase now complete and procurement complete for the second phase. Capacity building is an important element with training workshops, secondment of expert personnel to assist with specific phases of NREN Network development and scholarships to attend AfNOG workshops.

The **IPv6 Workshop** provided an overview of IPv6, Internet of Things and the current deployment of IPv6 at different institutions. An output of this workshop is that a IPv6 Forum chapter will be set up in Mauritius to foster adoption of IPv6 through IPv6 Address planning for Universities and IPv6 Training Curricula.

The **ICT Initiatives in Mauritius Workshop** provided an opportunity for delegates to learn more about the depth of ICT Initiatives currently ongoing at national level including the eGovernment Strategy 2013 - 2017 (G2B, G2C, G2G), eFiling of Tax Returns, Integrating ICT in the Education System, Supporting the ICT Industry to Export in the Region and the LAVIMS project.

The Scientific Programme on Friday incorporated sessions on Cloud Computing, ICT Regulatory Frameworks, Living Labs, Open Source and Open Data Applications, Cooperation with Finnish Institutions, eAgriculture and Environmental Sustainability, which shared research results and case studies from Europe and Africa.

The **Living Labs in Tanzania Workshop** provided insight into the Living Labs being supported by TANZICT. TANZICT is a Bilateral project between Finland and Tanzania, which is funded as a four year project (August 2011 - July 2015) by the Ministry of Foreign Affairs Finland with a budget of €5 million. MCST (Ministry of Communications, Science and Technology) is the Tanzanian government partner and COSTECH (Tanzania Commission for Science and Technology) is an implementation partner in the innovation component. TANZICT components include a Review of the National ICT Policy and development of an Implementation Plan, Strengthen institutional capacity in MCST and an Innovation Program. Within the Innovation component, TANZICT is supporting Living Labs in Iringa, Sengerema, Mbeya, Dar es Salaam, Arisha, Zanzibar and Morogoro. Participation at IST-Africa 2014 facilitated representatives from the Living Labs to participate in the IST-Africa Living Labs Working Group Meeting on Tuesday 06 May, network with other stakeholders and share their experiences during the workshop on Friday.

The session on **Innovation Leveraging Living Labs** provided case studies on Innovation and co-design leveraging Living Lab methodologies from Mauritius, Sweden, Namibia and South Africa (Siyadala Living Labs). This provided important cross-border knowledge sharing and opportunities to learn from more advanced implementations.

The **Cooperation with Finnish Institutions Workshop** provided an overview of the FinCEAL project, examples of ongoing Innovation projects and facilitated networking with representatives from a range of Finnish Institutions

who are interested in partnering with African institutions. Each institution provided a short presentation on their areas of expertise, track record and the types of partners that they are looking to work with, followed by interactive discussion. The FinCEAL project (Developing Finnish Science, Technology and Innovation Cooperation between Europe, African and the LAC region) is a two year project (2013 - 2014) coordinated by UniPID on behalf of the Ministry of Education and Culture, Finland. In an African context the thematic areas of focus are Health, Food Security, Climate Change, Renewable Energy and Information Society. It aims to increase the participation and influence of the Finnish research community in the EU-Africa policy dialogues, highlight Finnish expertise and enhance cooperation in Science, Technology and Innovation with Africa.

IST-Africa and CAAST-Net Plus jointly organised a **closed Horizon 2020 Training Session for African National Contact Points (NCPs)**. IST-Africa supported the participation of ICT National Contact Points from Angola, Botswana, Burundi, Cameroon, Egypt, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Senegal, South Africa, Swaziland, Tanzania, Tunisia and Uganda. CAAST-Net Plus supported the participation of Health NCPs from Ethiopia, Ghana, Lesotho, Malawi, Senegal, South Africa, Tanzania and Uganda. All supported NCPs participated in the **Horizon 2020 Workshop** on Wednesday afternoon, thematic sessions on Thursday and the NCP training session on Friday. The private training session provided an opportunity for the NCPs to learn more about how NCP Networks function in other African countries, information sources that they can access to support their activities, to meet NCPs from other African countries and to ask questions in relation to practical challenges that they are facing while supporting their national institutions.

Closing Plenary

The Closing Plenary Session of **IST-Africa 2014** focused on providing an overview of current Initiatives supporting ICT and Science, Technology and Innovation.



The session was well attended, chaired by Mr Vishnou Gondeea, Permanent Secretary, Ministry of Information and Communication Technology, Mauritius and incorporated presentations from Mr Moses Bayingana, ICT Expert, Information Society Division, African Union Commission (African Internet Exchange System - AXIS), Maryse Chung, Mauritius Sugarcane Industry Research Institute (Land Use Mapping using Satellite imagery), M. V. Ramana, Mauritius Oceanography Institute (Prospects of Oceanography) and K. Poonosamy, Managing Director, Board of Investment, Mauritius (New Economic Growth Engines of the Mauritius Economy).

African Internet Exchange System (AXIS) presented by Mr Moses Bayingana, ICT Expert, Information Society Division, African Union Commission

Moses provided an overview of the African Internet Exchange System Project (AXIS), which aims to support the establishment of National Internet Exchange Points (IXP) and a Regional Internet Exchange Point for Africa. AXIS was launched as one of the 8th Africa-EU Strategic Partnership projects, with an agreement signed between the African Union Commission (AUC) and Luxembourg Development Agency on 06 May 2011, with funding from the EU-Africa Infrastructure Trust and the Government of Luxembourg. The AUC commenced implementation in January 2012.

To date Best Practice and Internet Community mobilisation workshops have been conducted in 22 African Member States including Algeria, Benin, Burkina Faso, Burundi, Cameroon, Chad, Comoros, Congo Republic, Gabon, Gambia, Guinea, Liberia, Madagascar, Mali, Mauritania, Namibia, Niger, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone and Swaziland. The key outcomes of each workshop included Consensus to establish an Internet Exchange point and Formation of a committee to conclude the short listed proposals on: Name of IXP, Location, Organisational Structure and Constitution of the IXP.

Technical Trainings have been successfully conducted in the seventeen Member States including: Algeria, Benin, Burkina Faso, Burundi, Cameroon, Congo, Cote d'Ivoire, Gambia, Guinea, Mali, Mauritania, Namibia, Niger, Senegal, Seychelles, Swaziland and Togo. Technical Training to enhance the capacity of network engineers in Mauritius is scheduled in August 2014. A total of 339 Participants have been awarded Certificates on Technical Aspects of Setting up, Operating and Administering Internet Exchange Points.

The project has procured equipment, delivered them and facilitated the setting up and launch of Internet Exchange Points in Burundi, Namibia and Swaziland. The IXP in Gambia is scheduled to be launched on 11 July 2014.

Regional Internet Exchange Points (RIXPs) and Regional Internet Carriers (RICs) workshops have been held to: Foster stakeholder discussions on developing national IXPs to grow into Regional IXPs; Understand Regional IXP business models; Foster stakeholder discussions on implementing policies that support the emergence and growth of Regional Internet Carriers; Understand Regional Internet Carrier business models and Provide the essential elements needed for ISPs in the region to evolve and become Regional Internet Carriers. The AU-SADC workshop was held from 3-7 February 2014 in Gaborone, Botswana. Key outcomes of the workshop included: Building on existing structures and ensure that the SADC Policy and Regulatory framework committee develops the Policy Framework that will facilitate regional interconnection for the region and Guiding criteria to select ISPs to be supported to grow into regional internet carriers(RICs) and for selection of IXPs to be supported to grow into regional internet exchange points (RIXPs).

Future workshops planned include the AU-Eastern Africa workshop, 26-30 May 2014 in Kigali, Rwanda; the AU-Northern Africa workshop, 08-12 June 2014 in Nouakchott, Mauritania; the AU-ECOWAS workshop, 16-20 June 2014 in Abuja, Nigeria and AU-ECCAS workshop, 21-25 July 2014 in Libreville, Gabon.

It is envisaged that a Request for Application Proposals for IXPs in Southern and Eastern Africa to be supported to grow into Regional Internet Exchange Points will be advertised soon and a Request for Application Proposals for IXPs in Central, West and North Africa plan to be issued before the end of 2014.

Future plans include a Capacity building program aimed at building the business and technical capacity of selected Internet Service Providers in each AU Geographical Region to grow into Regional Internet Carriers and Development of Policy Frameworks that will facilitate regional interconnection will commence in the 2nd Semester of 2014.

Land Use Mapping presented by Maryse Chung, Mauritius Sugarcane Industry Research Institute

Maryse Chung presented the Land Use Mapping being undertaken by the Mauritius Sugarcane Industry Research Institute. The motivation was to develop a methodology that is rapid, reproducible to allow the updating and maintenance of existing data on natural resources. Existing pressures include the need for accurate and updated information for development planning, decision making & emergency response in a developing country like Mauritius; Need for sustainable growth in terms of limited land and fresh water and the Loss of high potential agricultural lands to various competing economic sectors following the lapse of the Sugar Protocol Agreement.

Maryse outlined that the logistics for the project implementation included: High speed internet connection for image download through FTP (File Transfer Protocol) or Google drive sharing - At least 100 Mbps; High capacity computer processing and storage capacity (64-bit processor, XGB); Good graphics card and sufficient Video RAM; Standard GIS software (e.g. ARCGIS), Microsoft office; Plotter with hard disk buffer capacity (HP Designjet T770); Backup facilities (Terra or gigabyte external hard disk/Server); Trained personnel and Transport for ground truthing. The Satellite image used is FORMOSAT satellite image (pixel size 2m x 2m, Image size 3-5 GB in uncompressed format, Cost ~ €10,000). The method used is Heads-up digitising and Merging and editing of ancillary digital files using ARCGIS software.

The methodology was developed to: Define land use per finest level derivable from image of this resolution (levels reached are 28); Eventual aggregation of these to match existing land use classification, as published by Statistics of Mauritius, i.e. 6 major classes of land use for follow-up and for comparison; Conciliation with different sources of digital files through editing of existing ancillary spatial data files (roads, rivers, sugarcane plots); Ground truthing & networking with field workers in surveying, agriculture, and in forestry; Accuracy assessment as part of methodology improvement. Evaluation is done through comparison with existing databases like GISCAN & Land Index and to Identify the sources of errors (errors of omission & errors of commission) to improve accuracy.

The classification schemes for the 2010 Land Use Map were identified to include 28 features and 9 sub-categories. Problems encountered included: i) Absence of reference values (e.g statistics or database on roads, drains); ii) Weaknesses of existing reference values for accuracy assessment – how reliable they are? (the origin/age/source and methodology used for compilation not documented); iii) Boundary conflict for different sources of data (linked to 2); iv) Double counting (linked to 2); v) On-going land conversion process; vi) Temporary land use (e.g rotational land) and vii) Unmapped but registered sugarcane plots. The major outcomes based on 2010 Land use was Agriculture (sugar cane and other crops) 41.5%, Abandoned sugar cane land - 0.8%, Forests, shrub and grazing land - 37%, Built-up areas - 15.1%, Infrastructure (Roads, footpaths) - 4.2% and Inland water resource system - 1.5%.

Future Developments include: i) Needs definition & set targets: Multidisciplinary approach for sustainable development. To encourage the interaction of technicians (science & technology) and decision-makers (societal

& economic needs); ii) Regular source of high/medium resolution satellite images required to ensure timely updates. Access to Satellite imagery through regional co-operation organizations like COI, SEAS-OI. Though price has gone down considerably, fund seeking is still a tedious process.; iii) Value local/regional expertise, and cater for capacity building to maintain spatial database; iv) Definition of a framework for costs/data sharing within the various departments/ ministries/ research institutions of the country/region; v) Resilience building for small island state requires good knowledge of its natural resources, as any change in the land use can disrupt the delicate balance of the ecosystem, and bring chaos inland as well as in the lagoon. Viz. Cause and effects of land use change on climate change and vi) Added-value and updated database is a corporate asset in digital world, therefore requires Data copyright protection, and data security measures.

In conclusion Maryse outlined that local government plays the role of facilitator, e.g. make available the list of potential imagery providers, the list of collaborative projects, and create opportunities to enable joint venture research among institutions & government bodies. This area has the potential to offer job opportunities for university students using the potential of smart phone / tablet application development in the field of satellite technology and development of turn key applications on smart phones to make the citizens active players in the country's development – e.g crop water stress, crop yield info, market demand, etc. There is a role for Cloud computing facilities: follow up of environmental changes locally/regionally, access to real-time information for practical daily monitoring/disaster management. Maryse thanked NCB for supporting her participation and the Director of MSIRI for his support to the SEAS-OI: Surveillance de l'Environnement assistée par satellite dans l'Océan Indien project.

New Economic Growth Engines of the Mauritius Economy presented by K. Poonoosamy, Managing Director, Board of Investment

Mr K. Poonoosamy, Managing Director, Board of Investment, Mauritius presented New Economic Growth Engines of the Mauritius Economy. Mauritius is a growing Economy having moved from Sugar as the main industry in 1970s to an Industrial focus in 1980s with increased tourism, to a Services focused by 1990s with Financial Services, ICT, BPO and Freeport to Innovation Driven in 2010s with Healthcare and Life Sciences and Renewable Energy. Mauritius has a preferential market access to 26% of the world's population. The New Economic Architecture incorporates: Developing into a high income economy with a focus on knowledge and service sectors; Implementation of the roadmap on the Ocean Economy; Advancing the Green Economy Initiative and Consolidating and Expanding an Africa Strategy. In relation to ICT and BPO, growing areas include Cloud Computing, Big Data, Knowledge Process Outsourcing, Mobile Applications Development and Software Development. Biotechnology areas include: Agro Industry, Health, Industrial and Marine. Mauritius was ranked first in Africa and 20th out of 189 countries in the World Bank Doing Business Survey 2014, first in Africa and 48th out of 148 countries in the World Economic Forum Global Information Technology Report, first in Africa in the World Economic Forum Global Competitiveness Report and first out of 21 countries in the African Index on Economic Transformation.

Acknowledgement of Support

On behalf of the IST-Africa consortium of 18 African partner governments, Paul Cunningham thanked the Ministry of Information Communication Technology and National Computer Board for hosting **IST-Africa 2014** Week. Paul acknowledged the significant support provided by Hon. Tassarajen Pillay Chedumbrum, Minister of Information Communications Technology, Mr Vishnou Gondeea (Permanent Secretary), Mrs Nowbuth, Nandini Luckputtya, Verna Pillay and all the team at the Ministry of ICT.

Paul acknowledged the fantastic work undertaken by Dan Faugoo (Executive Director), Ismael Limalia, Rekha Busgeet, Nandini Prayag, Riad Mohamudally, Vikash Heeralaul and all the team at National Computer Board mobilising the national stakeholders and preparing for **IST-Africa 2014** Week.

Paul thanked the European Commission and African Union Commission for their ongoing support and thanked Orange, SAP, the FinCEAL project, IEEE and Air Mauritius for their support for the event.

Paul thanked the International Programme Committee Members for the significant work undertaken to review papers and provide actionable feedback on how to improve papers for publication and presentations. Paul thanked the Session Chairs and Moderators for ensuring that the sessions were interactive and facilitated knowledge sharing.

Paul thanked the plenary speakers for their participation: Hon. Tassarajen Pillay Chedumbrum, Minister of Information Communications Technology; Mr Suraj Ramgolam, Chairman, National Computer Board, Mauritius; Dan Faugoo, Executive Director, National Computer Board, Mauritius; Mr Jean Claude de l'Estrac, Secretary General of the Indian Ocean Commission (IOC); Moctar Yedaly, Head of Information Society Division, African Union Commission; Mr Morten Møller, Programme Coordination, DG CONNECT, European Commission; Dr

Arjoon Suddhoo, Executive Director, Mauritius Research Council; Dr Krishna Oolun, Executive Director, ICT Authority, Mauritius; Mr N. Jugmohunsing, Assistant Permanent Secretary, Ministry of Tertiary Education, Science, Research and Technology, Mauritius; Zauria Saifodine, Director of ICT Capacity Building, Instituto Nacional de Tecnologias de Informação, e Comunicação, Mozambique; Dr Hemant Chitto, Ag. Director General, University Technology Mauritius; Prof Romeela Mohee, Vice-Chancellor, University of Mauritius; Prof Darelle Van Greunen, School of ICT, Nelson Mandela Metropolitan University, South Africa; Moses Bayingana, ICT Expert, African Union Commission; Maryse Chung, Mauritius Sugarcane Industry Research Institute; M. V. Ramana, Mauritius Oceanography Institute and K. Poonoosamy, Managing Director, Board of Investment, Mauritius.

Paul then handed back to Mr Vishnou Gondeea, Permanent Secretary, Ministry of ICT to officially close **IST-Africa 2014**.

Official Closing Remarks



Mr Vishnou Gondeea, Permanent Secretary, Ministry of ICT outlined his pleasure and honour to address the delegates for the official closure of **IST-Africa 2014** which has been a great success. This success augurs well for the future of IST-Africa and it is hoped that stakeholders in the 18 African Member States will take full advantage of the facilities being offered and there will be more fruitful collaboration among them.

Mr Gondeea highlighted that the Ministry of Information and Communication Technology is satisfied with the manner in which this event has been organised and the success it has registered has gone beyond their expectations.

On behalf of the Government of Mauritius and the Ministry of Information and Communication Technology, Mr Gondeea thanked IST-Africa for choosing Mauritius to host its 2014 Conference. The Ministry commended the European Commission and the African Union Commission for the support provided which has contributed to the success of the Conference. The Ministry congratulated IIMC, Ireland, Mr Paul Cunningham and his team for the tremendous efforts put in to coordinate and organise this conference, which was a job well done.

Mr Gondeea outlined the gratitude of the Ministry to all the speakers and resource persons who have kindly agreed to share their time, experience and expertise during the different sessions and workshops.

The Executive Director of the National Computer Board, Mr Dan Faugoo and the members of his staff were congratulated for the excellent work done in organising this Conference.

Mr Gondeea acknowledged his personal appreciation for the contribution which the staff of the Ministry of ICT has made for the smooth organisation of the event.

Finally, Mr Gondeea thanked all the participants for the hard work accomplished during the past three days. For those who have come from abroad, he hoped that they enjoyed their stay in Mauritius and will bring back with them, sweet and happy memories of their visit. He wished all the participants a safe and pleasant trip back home and indicated that the Ministry looks forward to working with IST-Africa in the future.

Awards



The Awards for Best Paper and Runner-up Paper were announced by Mr Dan Faugoo, Executive Director, National Computer Board and presented by Mr Vishnou Gondeea, Permanent Secretary, Ministry of ICT during the Closing Plenary Session of **IST-Africa 2014**.

All papers submitted to IST-Africa are double-blind peer reviewed by members of the International Programme Committee. As part of this process the reviewers nominate a shortlist of papers to be considered for the Best Paper and Runner-up Paper Awards. Two hundred and ninety one papers were submitted to **IST-Africa 2014** of which 97 were accepted and published in the Conference Proceedings.

The Best Paper was awarded to "Applying Keystroke Dynamics Techniques to Facial Thermography for Verification", authored by George Henderson and Ian Ellefsen, Academy of Computer Science and Software Engineering, University of Johannesburg, South Africa

The Runner-up Paper was awarded to "Connectivity within Indian Ocean Islands (Mauritius, Seychelles, Comoros, Reunion and Madagascar) - A Case for a Regional Internet Exchange", authored by Mahen Soobron, Cheeranjiv Soobron, Soodevi Soobron, Aneerav Sukhoo and Rajnish Hawabhay, Mauritius.

Networking

IST-Africa 2014 provided plenty of opportunities for delegates to network, continue building relationships with old acquaintances and build new friendships and partnerships.



Participants

There were over 460 participants at **IST-Africa 2014** from 44 countries (Europe, Africa, India, Japan and US). The organisations represented are listed below.

European Organisations

Organisation	Country
United Nations Industrial Development Organization (UNIDO)	Austria
eGovLab	Belgium
DG CONNECT, European Commission	Belgium
Vrije Universiteit Brussel	Belgium
Ceske centrum pro Vedu a Spolecnost	Czech Republic
CESNET	Czech Republic
CZ.NIC Association	Czech Republic
Czech Centre for Science and Society	Czech Republic
Wirelessinfo	Czech Republic
Technical University of Denmark	Denmark
Aalto University	Finland
Lapland University of Applied Sciences	Finland
Lappeenranta University of Technology	Finland
Tampere University of Technology	Finland
UniPID (Finnish University Partnership for International Development)	Finland
UniPID/University of Jyväskylä	Finland
University of Helsinki	Finland
University of Jyväskylä	Finland
University of Turku	Finland
VTT – Technical Research Centre of Finland	Finland
Airbus Defence and Space	France
Observatoire de Paris	France
empirica GmbH	Germany
University of Koblenz Landau, Campus Landau	Germany
Centre for Research and Technology Hellas	Greece
FORTH	Greece
IIMC International Information Management Corporation Ltd	Ireland
Politecnico di Milano	Italy
SnT University of Luxembourg	Luxembourg
University of Coimbra	Portugal
Comenius University	Slovak Republic
CIEMAT	Spain
Universidad Politécnica de Madrid	Spain
Universitat Politècnica de Catalunya	Spain
Innovation Impact	Sweden
Stockholm University - DSV	Sweden
DANTE	United Kingdom
Glasgow University	United Kingdom

African Organisations

Organisation	Country
Faculdade de Ciências - Universidade Agostinho Neto	Angola
Ministerio da Ciencia e Tecnologia	Angola
Communication Regulators' Association of Southern Africa	Botswana
Ministry of Transport and Communications	Botswana
Southern African Development Community (SADC)	Botswana
University of Botswana	Botswana
Ministere de l'Enseignement Superieur et de la Recherche Scientifique	Burundi
National Agency for Information and Communication Technologies (ANTIC)	Cameroon
University of Buea	Cameroon
Intergovernmental Authority on Development (IGAD)	Djibouti
Information Technology Industry Development Agency (ITIDA)	Egypt
Information Technology Institute	Egypt
RCREEE - Regional Center for Renewable Energy and Energy Efficiency	Egypt
Addis Ababa University	Ethiopia
African Union Commission	Ethiopia
GirlHub	Ethiopia
Ministry of Communications and Information Technology	Ethiopia
Ministry of Science and Technology	Ethiopia
Moha Soft Drink Industries (PEPSI)	Ethiopia
United Nations Economic Commission for Africa (UNECA)	Ethiopia
Economic Community of Central African State (ECCAS)	Gabon
Ghana Institute of Management and Public Administration (GIMPA)	Ghana
Ghana Space Science and Technology Institute	Ghana
Ministry of Environment, Science, Technology, and Innovation	Ghana
Science and Technology Policy Research Institute (STEPRI)	Ghana
Ghana Health Service	Ghana
@iLabAfrica, Strathmore University	Kenya
African Virtual University	Kenya
Jomo Kenyatta University of Agriculture and Technology	Kenya
Kenya Human Rights Commission	Kenya
Kenyatta University	Kenya
Ministry of Education, Science and Technology	Kenya
Moi University	Kenya
SciDev	Kenya
Strathmore University	Kenya
The Technical University of Kenya	Kenya
United States International University (USIU)	Kenya
University of Nairobi	Kenya
Department of Science and Technology	Lesotho
Health Research and Laboratory Services	Lesotho
National Commission for Science and Technology	Malawi
AfriNIC	Mauritius
Board of Investment	Mauritius

Organisation	Country
British Computer Society (BCS)	Mauritius
CEB	Mauritius
Central Informatics Bureau (CIB)	Mauritius
Central Information Systems Division	Mauritius
Ceridian	Mauritius
CERT-MU, National Computer Board	Mauritius
Charles Telfair Institute	Mauritius
CISD	Mauritius
Competition Commission of Mauritius	Mauritius
Crainstech	Mauritius
C-SAC School	Mauritius
DCDM Consulting	Mauritius
DPP Office	Mauritius
Ebene Accelerators	Mauritius
E-Call	Mauritius
Educompelearn / Technopreneur	Mauritius
Evonue Digital	Mauritius
Financial Intelligence Unit	Mauritius
Food and Agricultural Research and Extension Institute (FAREI, ex-AREU)	Mauritius
Heyhoka Consulting	Mauritius
HRDC	Mauritius
ICT Authority	Mauritius
Indian Ocean Commission	Mauritius
IT Security Unit	Mauritius
KALDERA	Mauritius
Linkbynet Indian Ocean Ltd	Mauritius
Mauritius Bankers Association	Mauritius
Mauritius Broadcasting Corporation (MBC)	Mauritius
Mauritius Examination Syndicate	Mauritius
Mauritius Housing Corporation	Mauritius
Mauritius Institute of Health	Mauritius
Mauritius IT Industry Association	Mauritius
Mauritius Oceanography Institute	Mauritius
Mauritius Post Ltd	Mauritius
Mauritius Research Council	Mauritius
Mauritius Revenue Authority	Mauritius
Mauritius Sugarcane Industry Research Institute	Mauritius
Mauritius Telecom	Mauritius
MCIA	Mauritius
MHL / LAVIMS	Mauritius
Middlesex University (Mauritius Branch Campus)	Mauritius
Ministry of Agro Industry	Mauritius
Ministry of Arts and Culture	Mauritius
Ministry of Education and Human Resources	Mauritius
Ministry of Health & Quality of Life	Mauritius

Organisation	Country
Ministry of Health & Quality of Life	Mauritius
Ministry of Housing & Lands / LAVIMS	Mauritius
Ministry of Information & Communication Technology	Mauritius
Ministry of Tertiary Education, Science, Research and Technology	Mauritius
MITD	Mauritius
MSIRI	Mauritius
MSIRI	Mauritius
Multi Carrier Mauritius Ltd	Mauritius
National Computer Board	Mauritius
National Library	Mauritius
NPCC	Mauritius
Office of Ocean Affairs & Development	Mauritius
Open Business Process	Mauritius
Open University of Mauritius	Mauritius
Oracle	Mauritius
Outremertelecom	Mauritius
Payment Express Ltd	Mauritius
PricewaterhouseCoopers Ltd	Mauritius
Rajiv Gandhi Science Centre	Mauritius
REUNIVEILLE	Mauritius
SMEDA	Mauritius
Telecom ParisTech	Mauritius
Tertiary Education Commission	Mauritius
United Nations Conference for Trade And Development	Mauritius
Universite des Mascareignes	Mauritius
University of Mauritius	Mauritius
University of Technology, Mauritius	Mauritius
UserTech Ltd	Mauritius
UTM	Mauritius
Virtual Works (IOI)	Mauritius
National Institute for ICT (INTIC)	Mozambique
Pandora Box, Lda.	Mozambique
National Commission on Research, Science and Technology	Namibia
Polytechnic of Namibia	Namibia
SILNAM IT Solutions (PTY) Ltd	Namibia
University of Namibia	Namibia
ECOWAS Commission	Nigeria
WACREN	Nigeria
East African Communications Organization	Rwanda
Girl Hub Rwanda	Rwanda
Ministère de l'Enseignement Supérieur et de la Recherche	Senegal
Université Gaston Berger	Senegal
Council for Scientific and Industrial Research	South Africa
CSIR Meraka Institute	South Africa

Organisation	Country
Department of Science and Technology	South Africa
Medical Research Council	South Africa
Nelson Mandela Metropolitan University	South Africa
NEPAD Planning and Coordinating Agency	South Africa
North-West University	South Africa
Rhodes University	South Africa
SAP Africa	South Africa
Tshwane University of Technology	South Africa
University of Cape Town	South Africa
University of Johannesburg	South Africa
University of KwaZulu Natal	South Africa
University of Pretoria	South Africa
University of South Africa/CSIR	South Africa
Vaal University of Technology	South Africa
Sudan University of Science and Technology	Sudan
Ministry of Information Communication Technology	Swaziland
Ministry of Science & Communication	Sudan
Arusha EcoLab /NM-AIST	Tanzania
COSTECH	Tanzania
EAC	Tanzania
Elimu Living Lab	Tanzania
Embassy of Finland	Tanzania
Ministry of Communication, Science and Technology	Tanzania
Rlabs-Iringa	Tanzania
SIDO	Tanzania
TanzICT Programme	Tanzania
The State University of Zanzibar	Tanzania
Ministere de l'Enseignement Superieur et de la Recherche Scientifique	Tunisia
CNOOC	Uganda
Icon Frontiers Uganda Limited	Uganda
Makerere University	Uganda
UbuntuNet Alliance	Uganda
Uganda Bureau of Statistics	Uganda
Uganda Christian University	Uganda
Uganda National Council for Science & Technology	Uganda
COMESA	Zambia
United Nations Economic Commission for Africa	Zambia
ZAMREN	Zambia

Other Countries

Organisation	Country
Centre for Development of Advanced Computing (C-DAC)	India
Kyushu University	Japan
Toyota Motor Corp	Japan
Open Business Process	US