Commonwealth
ICT Forum 2018

Digital Transformation for Development: People, Processes and Technology

Executive Summary

The Commonwealth ICT Forum 2018 hosted by the Commonwealth Telecommunication Organisation in collaboration with the Telecommunications Authority of Trinidad and Tobago took place over three days at the Hyatt Regency Trinidad from October 1 to 3, 2018. Delegates from member nations around the Commonwealth and other ICT stakeholders gathered for discussions around the theme: Digital Transformation for Development: People, Processes and Technology. The United Nations has identified global connectivity as a catalyst for social and economic development, particularly within marginalised communities. The Forum provided a context for information sharing and knowledge exchange as relates to existing and emerging technologies, regulatory and policy issues, as well as strategies for effecting change and fostering national development through the use of Information and Communication Technology.

The Forum sessions took a sequential approach in addressing the various subject areas. Session One outlined the relevance of broadband planning in changing the socio-economic landscape and quality of life. This session also introduced the significance of collaboration in realizing development plans and led seamlessly into Session Two, which encouraged amenable and open dialogue toward creating a favourable investment and development culture. Sessions Three to Five was a singular conversation on the orbiting impact of Net Neutrality, Over-the-top Services and Universal Service Funds on one another and included some dialogue on existing symbiotically though traditional service providers raised some objection to the idea. Day two concentrated heavily of the issue of privacy and data security beginning with the session Cybersecurity Strategy and Implementation. The remaining sessions on Blockchain and Cryptocurrency Opportunities; General Data Protection Regulation; and Artificial Intelligence – Definition, Opportunities and Challenges, which all broker in data, centered on the issue of consumers' rights to personal data protection while discussing advances made in each sector; consumer and industry benefits; and leveraging strengths to avert risk. Day three wrapped with sessions on Spectrum Management and the upcoming WRC-19 conference; the Internet of Things; ICT Innovation – Youth in ICTs and a final session on The Way Forward.

Primary themes arising out of the three days of discussion were collaboration, capacity building, innovation and political will. Participants were urged to innovate and approach challenges with new perspective. The digital landscape has changed the functionality of the world and governments have a responsibility to prepare and equip citizens for these imminent changes. Educational opportunities aligned to the emerging new world are important to building human capacity and promoting sustainable development. Public Private Partnerships is one way that governments can access additional funding to finance some of the projects necessary to transition citizens to the new age, as collaborators leverage one other's resources for mutual benefit.

The Forum closed with a presentation from the Conference Rapporteurs who provided a succinct recap of discussions over the three days. Chief Executive Officer, TATT, Dr. John Prince; Chairman, CTO and TATT, Gilbert C Peterson, SC; and Ag. Secretary General, CTO, Gisa Fuatai Purcell delivered brief closing statements thanking participants for attending the conference and encouraging them use the information and resources acquired to inform their strategies moving forward.

OPENING CEREMONY

Chief Executive Officer of the Telecommunications Authority of Trinidad and Tobago (TATT), Dr. John Prince welcomed delegates to the Commonwealth ICT Forum 2018. He encouraged the foreign delegates in particular, to experience the culture and cuisine of the host nation.

Chairman, Telecommunications Authority of Trinidad and Tobago (TATT), in his capacity as Chairman, Commonwealth Telecommunications Organisation (CTO), Gilbert C Peterson, SC, extended thanks to the government of Trinidad and Tobago for driving the effort s to further develop policy, regulation, technologies and investment within the ICT landscape in accordance with global standards. He also thanked the main sponsors for their support in making this event possible. The Forum, he said, provides a useful platform for the industry to meet and learn through dynamic and fruitful discussions, in a setting conducive to sharing and collaboration.

Deputy Secretary General, International Telecommunications Union (ITU), Malcolm Johnson cited the long-standing relationship between the ITU and CTO. He commended the CTO's efforts to assist members and other ICT stakeholders in better understanding and responding to the impact of existing and emerging technologies; and for its work in advancing the 2030 Sustainable Development Goals.

Ag. Secretary General and Director ICT Development, CTO, Gisa Fuatai Purcell reiterated the CTO's commitment to helping nations to bridge the digital divide and advance the Digital Transformation agenda. Toward this end, the Ag Secretary General encouraged participants to make the most of the Forum—share thoughts and experiences; gain insight into the emerging technologies and how it can help nation and people development; and called on nations to include youth in the discourse and to up-skill them for the age in which they live.

Executive Vice Chairman, Telecommunications of Trinidad and Tobago (TSTT), Rakesh Goswami delivered a futuristic presentation on the evolution of Disruptive ICTs, challenging participants to imagine the world in an age of Artificial Intelligence and the converging of technology to provide a seamless system of functionality. Bringing the realm of the impossible closer he followed with an announcement of the latest technology to hit the shores of Trinidad and Tobago—WTTX or Wireless to X, a 5G oriented service that will provide broadband connectivity to previously un-served rural regions.

Feature speaker, Selby Wilson, ICT Strategist at Caribbean Telecommunications Union, in his presentation continued along a thread initiated by Ag. Secretary General – CTO regarding the need for partnership and interdependence to advance the use of ICTs for development. According to Fuatai Purcell, "no country can work alone when it comes to ICTs…collectively we can help each other". Presenting on the advances being made by CARICOM toward a Single ICT Space he advocated that this is not possible without good governance and visionary leadership, stating that leaders must first transform themselves and then bring others along. People and Leadership are the two most critical components to digital transformation.

He continued, saying that Caribbean Governments must position themselves to take advantage of the technology revolution as it is an enabling tool to advance development and to improve processes in delivering value to customers and stakeholders. As such, government organizations must become fit for purpose in this technological world.

Session 1: Broadband Planning for Digital Transformation

- This session highlighted the role of the International Telecommunications Union (ITU) in promoting Broadband Planning for Digital Transformation and included a case study of the digital transformation process within one of Trinidad and Tobago's ICT service providers—the Telecommunications Services of Trinidad and Tobago (TSTT)
- TSTT presented a strong case for digital transformation as a catalyst for a competitive business model, revenue generation and enhanced value proposition
- Panel discussions explored the challenges to planning and digital transformation; gains made; and the need for collaboration for the benefit of the people, particularly the under-served

Key points arising from this session:
- The importance of broadband access to the socio-economic development of nations
- The need for buy-in at the highest political levels to advance the rollout of broadband in nations
- The need to work together to bring our competencies together for the common good
- The risks associated with resisting digital transformation
- The benefits to embracing and adopting the digital revolution

ITU's Dep. Secretary General, Malcolm Johnson, reiterated ITU's role in advocating broadband access—bringing the benefit of the technology to everyone, everywhere. He discussed its importance to nation development and the role that Public/Private Partnerships play in facilitating universal access.

He reported alarming statistics which indicated that 3.8 billion people are still not connected to the internet. Though 80% of the population of world is covered by 3G functionality only 50% actually access it. He identified the issue as one of affordability and relevance and noted the need to provide access to digital skills training. He described broadband access not as a nice-to-have but an enabling/empowering tool, particularly in nations where populations are under-served such as rural communities, young people, women and persons with disabilities. He cited examples where access has improved the lives of citizens, promoting social development, for example advance disaster warnings, access to antenatal advice by pregnant woman, and global reach for small business entrepreneurs.

He initiated a discussion around the following points which proved to be thematic throughout the Forum:
- The need for Governments to provide an enabling environment that facilitates a more feasible ROI for private sector's contribution to enabling universal access
- The need for greater engagement between organizations that historically had no ties/interactions
- The need for policy makers to develop an integrated policy framework that takes the social and developmental impact of broadband access into consideration as well as the perspectives of civil society, ICT developers, and other stakeholders

Vice President Supply Chain, Telecommunications Services of Trinidad and Tobago (TSTT), Keino Cox, brought a practical example of digital transformation to delegates as he discussed TSTT's transition to a digitized procurement process. He advised that without transformation, businesses run the risk of becoming obsolete and perishing in the new digital environment. He cautioned however that 70% of digital transformation processes fail if strategies are not taken to promote culture change and upgrade employees' skills.

He explained that an ICT disruption in one's business is well worth the effort as it brings a competitive business model, provides new revenue and creates value for one's business. Benefits to the business include technology for customer engagement, cloud computing, the internet of things and data mining.

Among the primary gains to TSTT's digitized procurement process were:
- Collaboration with iGovTT, the ICT arm of the Trinidad and Tobago Government
- Uptake of the platform by more than 129 countries including the US, Canada and the Czech Republic.
- Learnings from the process:
  - Importance of brining leadership on board with change

- o Creating a transformative culture to embrace the change
- o The re-engineered process provided an antidote to the manual procurement process

The panel discussion revolved around under-utilization of Broadband technology, in part, due to lack of knowledge but also mistrust of the technology and security of personal data. A common theme was the equipping of young people to lead the digital transformation advance through education and skill training. Of particular note, was the view that technology ought primarily to be for the benefit of the people. Citizens have a right to access technology because it makes life better. Moreover, nation building is inextricably linked to its people and therefore technology must be people-centered.

In discussing challenges to Broadband Planning panelists raised the following points:

- Low understanding of ICTs.
- Available but under-utilised
- Resistance to digital change among public sector offices
- The need to make broadband available to all, particularly the have-nots and the youth
- ICT development has to be people-centered—helping families
- Young people have to be equipped with 21st Century skills
- Outreach and public information programmes to encourage wider uptake among citizens, particularly the youth
- Willingness to leverage the resources of the ITU and CTO in promoting youth programmes that create awareness and provide training
- Public Private Partnerships as a means to facilitating access for the people
- Deployment of infrastructure to focus on/empower youth

Session 2: Regulatory issues: Creating a favourable investment and development culture

- Session Chair, Sir Joseph Bossano, Minister for Economic Development, Telecommunications and the GSB, Gibraltar summarised the session with a statement on nations' approach to the regulatory discussion—we must abandon the perception of regulation as restrictive
- The value of collaboration, information sharing and transfer of knowledge was underscored for its importance in providing key insights to effect change
- The Caribbean Telecommunications Union (CTU) outlined its steps toward creating a Single ICT Space for CARICOM through a common regulatory approach—highlighting gains to date and next steps toward implementation
- Its vision for a common CARICOM ICT space was defined as enablement, development and integration through the provision of reliable and affordable services. Benefits will include a harmonized eco-system, robust broadband infrastructure, security and unified standards
- Panelists representing Nigeria, Botswana and Sierra Leone discussed specific challenges toward a common regulatory approach while identifying characteristics that can contribute to a favourable investment and development climate
  These included issues of:
  - o Independent regulations
  - o Cost constraints, taxes and tariffs
  - o Transparency in regulation
  - o Anti-corruption commission
  - o Investment opportunities for industry growth
  - o Monopolisation versus competition
  - o Innovation
- It was acknowledged that varying contexts could affect progression to a singular regulatory approach in some regions. However, delegates were urged to continue to keep the channels of communication open as the opportunity to learn from each other never lost—good or bad.

Session 3: The Changing Nature of Universal Service Funds

- This session presented contrasting experiences regarding USFs and UAFs by panelists
- Points of deviation included the technology itself, access in terms of geographic and demographic reach, control of the Fund, and Policy
- The gains made by each nation were discussed
- There are lessons to be learnt from the South Africa experience with regard to public private partnerships, and funding and support for universal service and access
- In addition to generating revenue, policy can serve to ensure greater equity as relates to access, supply and demand

The South African Experience:
- The Republic of South Africa has taken steps to ensure a more relevant and comprehensive Universal Service and Access Policy. The Policy had to evolve to benefit the people of SA—future-focused and people-centered
- Identifying challenges with the previous USF, the government conducted an audit which included stakeholder consultations to arrive at an improved Universal Service and Universal Access Policy
- The policy aims to:
  - establish targeted and effective interventions to address market failure and ensure access by everyone to a range of communications platforms, networks, services and content
  - develop clear definitions and targets for universal service, universal access and related concepts
  - address both the supply and demand obstacles to achieving universal service and access
  - establish new innovative mechanisms to blend private and government funding in support of universal service and access
- 59.3% of South African households had at least one member who used the internet. Further, 53.9% access the internet using mobile devices. This is true of all areas—rural, urban and metro areas.
- The new Digital Development Fund (DDF) focuses on availability, affordability, accessibility, awareness, capability and quality of service of communication services to all people, in all reaches of SA. Measures toward this end include:
  - funding to promote digital entrepreneurship, awareness programmes and innovation
  - expanding the base of licensees to now include broadcasters, postal operators in addition to telcos
  - setting minimum contribution to 1% of annual turnover whereas it was previously capped at 1%
- SA acknowledged that these challenges are likely common in other developing nations and encouraged governments to adopt a multi-faceted, multi-stakeholder approach to assessing and addressing the universal service funds dilemma
- The Ugandan experience outlined many of the challenges that the South African model sought to address, while the Jamaican experience acknowledged revenue generation challenges and the need to augment the fund for greater efficiency and increased income generation.

Questions and Answers

- Responding to a question on the utilisation and functionality of the DDF in South Africa as compared to its predecessor, the current model will give government access to the full value of funds collected under the DDF. The DDF will function as a stand-alone entity and all funds will go into ICT4D projects. Under the old model which remitted USF into the Treasury, the money became part of a pool of funds that were allocated according to the general needs of the country.
- In Jamaica, the USF is used to finance digital education projects. The transition from a UAF to a USF was born in part due to a realization that more than access to ICTs, people needed to understand its relevance and develop skills to use the technology. As a result, a decision was taken to ensure that funds collected

would also be allocated toward up-skilling the old and the young whose ICT skills were likely under-developed or non-existent.

Session 4: Over-the-Top-Services (OTTs)

- The results of an OTT survey conducted by the Commonwealth Telecommunications Organisation's (CTO) was presented
- Beside the known impact of OTTs on USFs, attendees were presented with the current status of OTTs and a projection of the service model into the future
- The advantages and disadvantages of the impact of OTTs were also discussed as well as the challenges around imposing regulation
- CTO's recommendation following a review of the survey results was to embrace OTTs:
  - Use report output to create favourable OTT environment—in terms of policies, regulations and legislations
  - Adopt OTT services as being part of the App Economy—innovation needs to be encouraged as well
  - Countries are encouraged to determine suitable frameworks—requires regional and international consideration
  - Data protection and privacy—develop a national cybersecurity strategy that includes robust legal structures/instruments and governance
- Conversely, the view presented by the broadband service provider on the panel coincides with normative perspectives that call for greater regulation of OTTs and a taxation model calibrated for greater fairness among service providers. Recommendations included:
  - introducing horizontal economy-wide rules, including consumer protection, data protection, competition law and content, and a corresponding recalibration of sector specific rules
  - introducing new rules to address challenges specific to the emerging data economy, including widening the tax net to include all service providers
  - identifying changes needed to the wider legal framework to facilitate and foster the transition to digital services
- Acknowledging that there can be challenges with this approach, the following two points were highlighted:
  - The alignment of a cross sectoral approach and the coordination and implementation of agreed actions and timeframes at a regional level
  - The CTO can play a pivotal role in identifying legal & regulatory innovations required, experts aligned with these objectives, and assisting with coordination and thought leadership

Questions and Answers:

Questions for this session revolved around the idea of finding a way to have OTT providers regulated and paying to access the infrastructure provided by traditional telecommunications providers. ISPs and Telcos made the point that traditional providers are losing money because of unregulated OTTs. As providers of the same content as ISPs, it was felt that OTT providers should be subject to the same regulation and there is precedence for it in North America and Europe.

The discussion also considered the role of regional bodies in recommending and coordinating governments move toward a universal approach to regulation. However, this would depend on the political will of governments to transition to such a model. It was agreed that there should be greater symbiosis between traditional and OTT providers—one provides the infrastructure and the other innovation therefore room for greater collaboration between them exists. A caution was issued that in considering a universal approach to regulation significant thought and research should go into the process—contemplating issues such as business model, economy share, et cetera.

Session 5: The Impact of Net Neutrality

- This topic was presented from the perspectives of the regulator, service providers and academia
- The Telecommunications Authority of Trinidad and Tobago (TATT) presented the common arguments surrounding Net Neutrality while delivering its recommendation for a National ICT Policy for Trinidad & Tobago

- Recommendations included consideration of the needs of the country and its National ICT objectives as well as a relaxed position on paid prioritization and zero-rated pricing; but no blocking and throttling, or intentionally restricting lawful content, services or applications
- The views shared by academia coincide with those of the regulator. Furthermore, they prescribe that traffic should not be privileged and that regulators should encourage a free and open system
- Challenges outlined during the discussion included inability of legislation to keep pace with the speed at which technology is changing
- A debate also ensued as relates to congestion pricing as a form of traffic management as there are implications for cost, access and equity
- Consideration for pricing based on consumption was also brought to the table. The point was made that data consumption is increasing exponentially and ISP revenues cannot keep up with the investments needed on their networks. The objective of this pricing model would be to bring demand and capacity more in line.

Questions and Answers:
The discussion during the Question and Answer segment:
- How can regulators facilitate the development of competitive environments that allow for innovation and entrepreneurship?
- Do you agree with the proposition that there needs to be focused discussion on the impact of NN regulations on the issue of profitability. Is impact really about the bottom line of ISPs or do we need to broaden our discussion to consider how any regulation affects society as a whole?

Responses included:
- Difficulty Regulators face in keeping pace with the rapid changes in technology
- The need to manage networks for the benefit of society—education, health, et cetera
- Pricing based on consumption—done previously but more difficult in today's wireless climate
- Pricing based on quality of service (QS), however the issue of controlling congestion now arises as previous traffic management methods can't be applied to this model
- Innovative pricing based on QS but at a lower cost as part of a congestion pricing model
- Congestion control using traffic management that randomly drops packets equally across all customers, providers, sources—one may take into account the type of traffic in use
- ISP generating greater revenue through innovative pricing methods
- Pay for de-prioritizing
- The need for flexibility to accommodate the continued evolution of technology—from ARPANET to social media, to perhaps IoTs in the future

Additionally:

Q: The Caribbean region has a no blocking/throttling regulation. How can co-regulatory and industry initiatives ensure best practice and encourage more flexibility by the regulator in this area.

A: NN cannot be approached as having access to everything. There has to be some level of restrictions considering that lawful and unlawful content exists. ISPs cannot be allowed to block lawful content however a responsible interception of unlawful content where a threat is posed to persons or national security is welcomed. There needs to be a joint conversation between regulators and stakeholders in the industry to discuss further.

Session 6: Cyber Security: Strategy and Implementation

- Session included presentations by Anslem Charles, ICT Manager, CARICOM IMPACS and Tracy Hackshaw, Chair of the Internet Society, Trinidad and Tobago Chapter; followed by a panel discussion on developing CERTS in the national interest
- Session Chair, CTO's Manager Technical Support and Consultancy, Dr. Martin Koyabe set the stage for the discussion, identifying the reality that not all cybersecurity (CS) plans are created equal
- He underscored the importance of adequate levels of cybersecurity and the need to minimise challenges related to the adoption and implementation at the national level
- CARICOM IMPACS provides a CS framework for the management of cybercrime and cybersecurity

- It seeks to help governments identify components, goals and activities to be addressed. It is collaborative in its approach as it includes inputs at the local, regional and international level
- A key strategy identified in the CARICOM IMPACS framework is creating public awareness as a means of protecting average citizens from cybercrimes
- The "Stop. Think. Connect." (STC) campaign—adopted by the Trinidad and Tobago Chapter of the Internet Society—promotes online safety using audiovisual content that targets various audiences
- It relies on consumers of this information, ordinary citizens, to spread the word about online safety through peer-to-peer and social groups, et cetera
- The Trinidad Chapter leverages content produced by its North American counterpart
- Of note is the inclusion of young people in the digital skills/cybersecurity conversation. One of the video resources targeting school-aged children was produced and delivered by school-aged children
- One drawback identified was the need to develop local content that speaks specifically to issues relevant to the Trinidad and Tobago/regional context
- Unfortunately, access to funding in the local market has made creating content difficult
- On the issue of developing CERTs in the national interest, the panel discussed the challenges around on-boarding and retention. However, a creative approach to this issue is the establishment of internship programmes targeting young people to create greater interest, facilitate continuous training, and infuse fresh blood to the system

Questions and Answers:
Questions centered on strategies to create awareness and buy-in at all levels to advance the cybersecurity agenda—students exercising safety, average citizens understanding how they are affected and sensitization among politicians to effect policy changes. Politicians must be made aware of the significance of cybersecurity and the risks to the national interest if they are to push the agenda and support robust regulation. Media campaigns are encouraged to push inforamtion out at the grassroots level.

In the area of the youth, one project aimed at skills training in Trinidad is the establishment of a Centre of Excellence in Cybersecutity. The idea is to train and certify young people thus creating specialist in the field who can support cybersecurity efforts not only in Trinidad but the region or further afield. At the level of promoting youth awareness and in response to the challenges raised by the Stop. Think. Connect. programme in Trinidad, a recommendation was made to engage Google to learn more about its Cyber Defenders programme which promotes awareness for digital safety and cybersecurity among young people. Google is very interested in working with governments and different stakeholders to educate young people in this area. STC can leverage Google's resources to generate local content and address other needs.

Additionally:
Q: Should the CERT be housed in the Ministry of National Security or the Telecommunications Regulator?
A: It depends on government policy, culture and ultimately who wants the responsibility for it.

Q: Is there a course in ethics that grooms developers to consider risks to customers when building Apps?
A: Developers need to be responsible and consider the primacy of consumer protection when developing code and building Apps.

Session 7: Blockchain and CryptoCurrencies: Opportunities
- This session provided hard evidence on the successes of the incorporation of Blockchain and Crytocurrency technology in the commonwealth
- Success stories highlighted personal empowerment, the Caribbean's contribution in this area—through the Bardados-based Aion Foundation and how adoption of this technology at the level of the government of Bermuda has guaranteed its continued growth and success at a time when survival appeared threatened
- The resultant discussions sought to address questions and concerns around this topic, including the volatility of the currency, inter-operability, safety, profitability and risks

- Aion, a Barbados-based business, is the first Blockchain to be launched in the Caribbean with operations that span different parts of the globe. Its proposed value proposition is to provide inter-operability, a feature not commonly available or practiced within existing Blockchain networks
- Aion is committed to supporting the vision of the Caribbean as an innovation hub. To this end its business is focused on best-in-class operations and contributing to human development through aid and education
- The architecture of future economies and new financial markets is changing and the education in the Caribbean has to change with it if the region is to attract top innovators from around the world
- The first intake of students to pursue courses in Blockchain occurred in January 2018 at the University of the West Indies, Barbados. Students have already begun work in the field for players outside of the region. Education week in Barbados will feature the Blockchain Global Youth Initiative sponsored by the John Maxwell team, where students will learn about the technology and gain skills in other areas.
- On the nation level, Minister of National Security, Bermuda presented a convincing case for the validity and strength of Blockchain and Cryptocurrencies in his presentation on the government entity, FinTech. Following the fallout of the North American financial crisis, many re-insurance companies started leaving Bermuda. The country needed to find a way to repay its debt. Leveraging its strengths as a world class regulator, multi-industry strength, Blue-chip reputation, and global compliance leader they investigated and pursued the Blockchain industry which returned the country to a place of stability and growth once more
- In an effort to broaden the scope of the nation's success, government sought to educate its people on the Blockchain economy and embarked on a public awareness campaign that took information about the new economy to the people at country clubs, football clubs, schools, Chambers of Industry and Commerce. The objective was to get everyone to see, from the youngest to the oldest, the opportunities available at the various levels
- The youth perspective was presented by entrepreneur, Jarryon Paul, who demystified Bitcoin to describe it simply as the latest iteration of money. Analogising early traders reactions to transitioning from bartering to the use of coins to the current skepticism that people have toward Bitcoin currency today.
- This new form of money puts power directly into the hands of users, circumventing third parties like the bank in preference for peer-to-peer transactions
- He encouraged participants to investigate the technology before dismissing it—it needs to be experienced not shown

Questions and Answers:

The issue of inter-operability of technology was discussed, specifically whether there can be agreement and a common standard for inter-operability of cryptocurrencies. The ecomonic value of the currency is tied to its closed network however it was felt that inter-operability can redound to the benefit of many. Discussion and cooperation would be needed between network operators to facilitate inter-operability and agree on standards.

The struggle to regulate Loot Boxes—a gaming feature that facilitates online gambling— was raised and advice solicited from the panel. In response, using the example of ICO regulation in Bermuda, the recommendation was to develop a Loot box-specific regulation that would subject operators to diligent checks and compel them to provide comprehensive data about their operations for the safety of its users. In addition, given the fast pace in which technology continues to evolve nations have a responsibility to ensure that its legal and regulatory teams continue to evolve to stay in step with the latest developments.

Regarding the profitability and volatility of cryptocurrencies, the question of its value as a source of generating income was posed. Here participants were cautioned to be wary of get-rich-quick-schemes. Instead, do the research, acquire knowledge and understanding of the technology itself before making a decision to invest or not invest. Considerations to invest should also include how much disposable income one has, whether retirement or other investments already exist, how long is one willing to hold on to the instrument.

Session 8: General Data Protection Regulation (GDPR)

- The session provided the background for the GDPR, defined its operative scope and the implication of non-compliance for organisations

- The session also explored, in general, customers' rights to privacy and data protection
- The GDPR specifically aims to protect the personal data of EU citizens and residents and applies to companies around the world that process and collect/hold personal data
- In addition to heavy monetary fines imposed upon organisations found in breech, there is also risk to reputation, customer attrition and reduced trade opportunities
- Real-life examples of the Equifax and FB Data Breaches were cited and the monetary fines associated with these breaches
- The Internet Corporation for Assigned Names and Numbers (ICANN) explored the implications of the GDPR on its institution as it manages the Registration Directory Services (RDS/WHOIS) system, a publically available directory containing information about registered domains, and outlined the steps being taken in its move toward GDPR compliance
- The session also acknowledged the challenges of meeting compliance such as complexity of the regulation itself, limited awareness/understanding and high cost of compliance to organisations but also provided steps and activities for overcoming these hurdles
- Steps/activities included identifying the requirements for one's business; engaging stakeholders, planning a compliance programme, and assessing readiness as well as:
    - Providing sufficient time for implementation
    - Developing education campaigns to promote understanding
    - Continuous assessment and active engagement—compliance is not a one-off thing
- Opportunities for developing nations were discussed in terms of its contribution to the privacy and data protection landscape, such as the development of strong, robust data protection policy; establishment of an independent supervisory authority
- The Regulator's perspective called for a harmonization of laws in the Caribbean that will encourage data protection. The Commonwealth has a role to play in data protection regulation as existing ones primarily benefit European and North American dwellers. This raised the question of the need to re-examine the region's legislative framework and human capacity for achieve this
- A harmonized approach will also depend on the capacity of a nation to carry the cost so that it is equitable and fair, not burdensome

No questions and answers session

Session 9: Artificial Intelligence—Definition, Opportunities and Challenges

- This session was led by Professor Patrick Hosein of the University of the West Indies, Trinidad and Tobago and provided a broad understanding and the inter-relationships within the world of Artificial Intelligence
- The discussion clarified such terms as Artificial Intelligence (AI), Big Data, Business Intelligence and Machine Learning and how these concepts intersect with each other,
- Participants were also exposed to various examples of the use of AIs in day-to-day life/transactions/activities, such as: social media, online retailing and entertainment, manufacturing, health sector, IoT, et cetera
- Professor Hosein linked the AI surge to growth in Big Data video, IoT sources, business intelligence, data analytics and machine learning
- In discussing the perils of data analytics the issue of privacy and security surfaced once again in the conversation on data collection. AIs rely on data to work effectively. This follows the GDPR discussion in the previous session which outlined customers' rights to privacy and data protection
- As the AI market grows so too are jobs in the field emerging—ML Engineer, Data Scientist, Big Data Developer, Full Stack Engineer to name a few
- This brings to bear nations' responsibility to ensure their education systems are relevant and evolving with the changes to the digital landscape. New courses must be designed and people trained, particularly the youth, with skills befitting the technological age
- Educational opportunities are already being introduced in the Caribbean, specifically with regard to AI. A proposal is currently being prepared for a PhD level programme in Trinidad

- AI technology has already been deployed in the telecommunications industry—customer service chatbots, data monetizing, speech recognition services (Alexa, Siri)
- The Commonwealth is poised to take the lead in certain areas especially as relates to issues specific to the region

Questions & Answers

The conversation around AI took a very futuristic tone as questions were posed around the ability of humans to co-exist with the technology; AIs hacking itself and locking humans out with new algorithms; the use of the technology to perform human tasks and how the technology can be used to create greater efficiencies for organisations.

The view seemed to be that we are a long way off from machines behaving like humans. AIs are programmed to perform very defined tasks and cannot learn from one-off instances. Regarding the concern of AIs self-hacking and pushing humans out of the process, while there are no definitive answers the technology is developing slowly enough to allow humans to write code and amend protocols to address potential issues.

The concept of AIs performing the role of HR managers to assess data and recommend candidates was discussed. To some extent this is taking place now as companies use a form of the technology to head hunt. Potentially there will come a time when AIs assess human expressions and responses during interviews to recommend the best candidates.

Also on the agenda was the efficient use of data, with specific emphasis on the Caribbean and whether data solutions can be provided indigenously. In the case of Trinidad, this is being done to some extent now using samples of existing data to show businesses how it can improve operational efficiency, procurement practices and overall productivity. While these solutions can be provided extraneously Caribbean providers are best placed to offer solutions based on the shared experience of the region.

In closing, Caribbean nations of the Commonwealth were encouraged to take the lead in solving problems and not wait to follow others. There are areas within which the region can participate competitively given its intimate understanding of region-specific scenarios. As part of that approach there is a need to develop students through training to better understand the field.

Session 10: Spectrum Management—National Regulatory and Policy issues

- The ITU's spectrum management conference takes place in 2019. The World Radio Conference—WRC-19 will recommend modifications to the ITU Radio Regulations and will seek to make suitable spectrum allocations to telecommunications services which depend on this resource. In addition, Spectrum for the advancement of 4G and 5G services will be allocated.
- During this session of the Commonwealth ICT Forum 2018 participants heard from the satellite and telecommunications industries
- Inmarsat's Regional Advisor - Regulatory & Spectrum, Bashir Patel, in laying the ground work for his presentation outlined the importance of the WRC process as the largest consensus-building forum in the world; convening countries of different sizes and economic strength with diverse needs; and the role it plays in securing balanced outcomes
- He highlighted the importance of decisions at the WRC-19 in ensuring sustainable solutions that meet the varying needs of users from SDGs to IMT/5G. He later identified the satellite industry's agenda at the WRC-19 to:
  - Defend existing satellite spectrum | Study regulatory/flexibility aspects for satellite services | Obtain new satellite spectrum
- He clarified the industry's agenda by highlighting its evolving role in enabling connectivity for all. Satellite operators enable connectivity during emergencies when terrestrial communications systems go down and provide instantaneous, reliable connectivity to first responders, relief workers and affected populations. Technical feasibility cannot afford to be compromised

- In closing he identified new satellite services to be adopted and provided—ESIMs, GMDSS New Operator, deployment of S-band for aviation, additional spectrum for FSS; and challenged regulators and policy makers to consider how much spectrum mobile providers absolutely needed and to soberly consider the bands identified/recommended
- In the Caribbean Telecommunications context, CANTO advocated operator-participation in the WRC-19 process
- The Caribbean Public Policy Broadband Mandate requires input from all stakeholders, including operators, to ensure that the requirements at all levels are deliberated
- Through strengthened links between governments, regulators and regional bodies like CTU and CITEL, the precise needs of the Caribbean region can be adequately reflected in the WRC-19 deliberations
- CANTO's recommendations to Caribbean delegates re WRC-19:
  - Consolidate operators' positions
  - Support Regulators and Governments in understanding the practical market impacts of proposals
  - Support proposals at CITEL and ITU which will make more mobile spectrum available to the Caribbean
  - Once spectrum is designated for mobile use, Regulators and Governments should move quickly to release it so that Operators can deliver the benefits to individuals, industries and society as a whole

Questions & Answers

The first comment was a recommendation from the floor for participants to access the CPM Reports from past WRC conferences to assist with preparations for WRC-19. These are said to be an excellent resource that will assist with preparations and significantly cut down on the work to be done. The reports comprise of feedback from experts around the world who have delved into the subject matter to outline the prevailing state of affairs and provide suggestions.

A call was also made for strong representation at the WRC. Smaller states were encouraged to ensure that their delegations are adequately prepared, attending the relevant meetings and making the right contributions. A strategy to ensure this was the inclusion of CANTO and CTU to the Caribbean delegation, even as they hold observer status.

Advice was solicited for dealing with cross-border interference as relates to frequency issues. The recommendation was to work through it and deal with it amicably. These issues can arise as a result of size of the land mass and proximity to neighbours.

On the question of commercializing spectrum and orbital resources in the Caribbean, CTU indicated there may be a need to revisit the idea given current advances in satellite technology. A business case was put forward prior to 2010 for a dedicated satellite for the region, however, the case was not strong enough and neither governments nor service providers at the time were able to facilitate it.

Solar panel re-absorption and conversion of satellites in outer space was a technical question put forward that would be addressed offline. However, in a simplified response as to how solar bursts affect satellite and communication links, reference was made to the L-band spectrum used by Inmarsat where little interference is reported, with the odd outage totaling less than one hour in a year, typically on the communications side.

Session 11: Internet of Things

- Very informative discussion on the Internet of Things—what it is and how it works
- Real-life examples of IoTs in operation in industry as well as personal use
- Privacy and Security issues
- Risks associated with inter-operability and standards

This highly informative session defined IoTs quite simply as a network of items, embedded with sensors that are connected to the internet. The session went on to explain the diverse interactions of the components of IoT devices. Participants were provided with real-life examples of the technology operating in the home, enterprise and utility

services. These included wearable smart devices, patient surveillance in healthcare and water-network monitoring in utilities.

Though communications are currently facilitated on a number of platforms there are short-comings that impact speed and latency, energy efficiency, scalability and vulnerability. 5G technology promises to eliminate many of these challenges with the promise of reduced latency, energy saving, cost reduction and higher system capacity.

Regarding the quantity of data collected by IoTs, Machine Learning (ML) can aide in data classification as well as analysis for predictions and recommendations. This led to a discussion on security and privacy of IoT data and need to ensure that entities are compliant with privacy and data regulations as breeches can result in heavy fines and affect consumer confidence. Inter-operability and standards is another challenge faced by consumers as numerous vendors, consumed with bringing products to market, do not make inter-operability a priority.

Questions & Answers
With 30-50 billion IoT devices collecting data the question was raised about how secure the data is and where it is being stored. Panelists' perspectives:
- It is important to know where your data is stored. Be judicious and do not assume everything is just ok
- The cloud doesn't exist. It is a data center located somewhere perhaps in a country where you do not want your data to be
- The Caribbean can provide an alternative location for data storage
- Encryption on IoTs is computer intensive because these are small devices with limited energy. There is a need to come up with innovative ways to encrypt and anonymise the data
- Though the quantity of data collected by IoTs is a lot it does not compare with what is collected now from 4K video
- Be mindful of where data is being stored and choose a place where you have the most control over it

Session 12: ICT Innovation – Youth in ICTs
- Discussion on this topic explored the best ways of engaging young people and empowering them for the future
- Strategies included teaching them to innovate and providing mentorship and training opportunities for them to do
- Public/Private partnerships remain an important component of national development, specifically with regard to youth opportunities
- Education is another critical strategy in enabling innovation among the youth

As technology progresses, it is important to seek and gather the views of tomorrow's leaders in order to better understand their role in the adoption, utilisation and future development of ICTs. Young people constitute 80% of earth's population however 40% of them are unemployed. Entrepreneurship and innovation are key to them providing for themselves and their families in the future.

This session featured the voices of young entrepreneurs/youth leaders in business and advocates for youth development. In sharing their experience Sergio Pengel, Founder/CEO, PIEDATA and Daniel Smith, Senior Manager, Digital Marketing, TSTT highlighted the key areas in which support is critical:
- Framework—policy, legislation, infrastructure
- Partnerships—educational institutions, public private partnerships
- Resources—mentors, legal structures
- Finances—accelerators and incubators
- Access to markets
- Funding—staffing and equipment
- Marketing—branding and story telling

They challenged young people to position themselves higher up the value chain—from re-sellers of items to high-value manufacturers; encouraged them to ask for help; and reminded them to press through hard times as there are no easy answers

Deputy Minister, Telecommunications and Postal Workers, South Africa reiterated the view of empowering young people through education highlighting that government's approach:
- Equipped and encouraged young people to help themselves
- Involved them in the dialogue about plans for their future
- Listened to what they identified as their needs
- Increased the incubation period at Innovation Centers from one year to three years
- Called on support from the private sector

Caribbean Representative, ITU, Cleveland Thomas identified his organisation's support for youth development in ICT, which includes the digital skills for decent job campaign aimed at identifing decent jobs for youths. However, he did concur that there are challenges in the region regarding wider support for Youth. His recommendations included:
- Creating an atmosphere where young people could take charge, breaking boundaries, getting involved with governance and politics
- Risk taking by young people as a means to help propel them forward
- Greater governmental leadership/support—political will

Questions & Answers
This round of discussion took its cue from a comment made by a young entrepreneur in the audience, who proffered the need to increase the quality of entrepreneurs from the onset. His premise is that many young entrepreneurs believe they are ready for funding but come to market not product fit. As entrepreneurs, he challenged his peers to fairly assess themselves and determine what stage in the process they are at—Is mentorship required for success, Is there a need to acquire a better understanding of the market and stakeholders—before seeking out funding.

In a question to the panel, he asked their opinion regarding what was perceived as the next step in producing more customer-focused, quality entrepreneurs
- Timing is important—first to market or getting there at the right time
- Legislation—to support the building out of the eco-system and to facilitate growth of budding businesses
- Collaboration—private sector has to bet involved to provide opportunities for young people either through funding, mentorship, internship, skills training, et cetera

Session 13: The Way Forward

In the context of ICT4D discussions over the duration of the Forum, St Helena, a remote self-governing overseas territory of the United Kingdom in the South Atlantic Ocean, shared its plans for nation development through improved connectivity. With a population of 4,500 persons, St Helena's plan revolves around bringing the nation into greater connectivity locally and globally.

To this end, the St Helena Government accessed funding for the landing of Fibre Optic Cables to support the upgrade of the island's technology and services. This was soon followed by the signing of a Memorandum of Understanding with South Atlantic Express to provide a branching spur to St Helena from a submarine cable between South Africa and South America. These collaborations will significantly advance the strategic objectives of the nation and position them inside the current technological landscape.

Continuing the conversation on the way forward, a question regarding how the CTO could further support members met with recommendations to facilitate ongoing communication, possibly through an online forum, to allow members to share experiences, best practices and solutions. This would bridge communications between conferences allowing members continuous, ready access to the accumulated wealth of knowledge resident within the Commonwealth. Another recommendation was for assistance from the CTO in helping nations to re-organise its strategies to attract private sector participation in education and other developmental activities.

On the issue of building capacity the discussion centered on identifying the direction of growth of ICTs and making a determined push to educate the people of the region to get them ready for the next level of ICT jobs. The value of the ICT Forum was also identified as an effective tool in capacity building.

ITU made the point however, that the CTO has limited resources and reiterated the need for collaboration to avoid duplication of efforts. Advocacy was made for more countries to join the CTO, especially the large developed nations that could add the value of their experience and success to the Commonwealth. Meanwhile the CTO was encouraged to seek new opportunities to collaborate with other organisations within the commonwealth to leverage its corporate strengths for the benefit of the region. Additional recommendations from the floor included broader reach of programmes to raise awareness for the work of the CTO e.g. radio programmes, live stream, newsletter, et cetera; greater North/South and South/South co-operation; Youth participation to more deeply penetrate that demographic.