



Many Nations... One Voice
Muchas Naciones... Un Sentimiento
Vele Landen... Een Stem
Plusieurs Nations... Une Seul Voix
Differente Nashon... Un Bos
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CANCION



TELESUR

WE MAKE AN IMPACT





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Mission

Influence the innovation and development of ICT solutions for the benefit of members by developing, navigating and leveraging relationships with all stakeholders. Advocate for policies, legislation and rules which advance the creation of an environment which facilitates the deployment of services and technologies around the region.

Vision

To become the leading authority in shaping information, communication and technology in the Caribbean and the Americas.

Objectives of Cancion

To inform CANTO's membership of information and communication technologies and policy developments taking place in the member organizations of the association.

To reach policy makers of the Caribbean, sharpening their awareness of regulatory developments and technological progress as it affects the region.

To provide CANTO with a literary voice to reach others in the region and internationally, with news, information and analysis of information and communication technology developments in/or affecting the Caribbean.

If you or your organization are engaged in or informed about activities or developments which impact upon Caribbean information and communication technologies please write and let us know.

The information presented and opinions expressed herein are those of the respective authors and do not necessarily represent the views of CANTO and/or its members



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Editorial (English)

Taking a bold step into the future 2019 is set to be an exciting year.

As the demand for ICT services in the Caribbean continues to explode, governments and Caricom are making moves to adjust to the new reality.

The latter is working towards a Single ICT Space, which is being called “the digital layer of the Caricom Single Market and Economy (CSME).” It’s intended to unify the development of ICT across the region by suggesting legislation, getting rid of roaming charges and creating entrepreneurs in the field, among other goals.

“The Single ICT Space speaks to collaboration with all stakeholders and a robust regulatory environment, taking into consideration all the emerging trends in technology. This is something that CANTO and its members welcome,” said CANTO Secretary General Teresa Wankin in a media interview during the organization’s 35th annual general meeting in January, held in Guyana.

At the AGM, Guyana’s Minister of Public Telecommunications, Hon. Catherine Hughes, shared the country’s plans to have all government institutions online by 2020, to put in place legislation to facilitate the growth of the ICT sector and to give more communities in poor and remote areas access to the Internet.

In a televised address around the same time of the AGM, the Bahamas’ Prime Minister, Hubert Minnis, said ICT projects linked to tourism were boosting foreign investment in the country. He said his government aimed to make the islands a “technology hub”.

The challenges to these ICT goals, as discussed at the AGM, include a need for more people with ICT skills; privacy concerns and security risks; and dealing with Over the Top (OTT) services like WhatsApp and FaceTime.

“Operators have been re-examining and changing their business models to compete with these unregulated online services,” said Julian Wilkins, in a farewell speech as he stepped down as CANTO chair after four years. “This is a significant challenge for Caribbean network operators who conduct business in a regulated environment but compete with unregulated OTTs offering the same services.”



The AGM also discussed projects to deal with some of the challenges.

CANTO is working with Guyana's education and public telecommunication ministries and the GSMA to conduct what are being called the Girls for Tech workshops, which would give young women 15 to 18 years old training in computer technology, including coding.

At the AGM, participants also discussed encouraging ICT entrepreneurship in the region, payments and fraud management. There was also a training session on "Unlocking Rural Mobile Coverage", which dealt with the "connectivity gap" in rural areas.

The conversations will continue at CANTO's 35th Annual Conference and Trade Exhibition in Trinidad in July. Since its founding in 1985, CANTO has grown from an organization of eight telephone companies to a membership of 138 public and private entities in 35 countries.

"I think CANTO is fundamentally on the right track and I want to build on the good work CANTO has been doing," said new Chair David Cox in an address at the AGM.

"I believe we can become the largest and most influential forum for everything related to the Caribbean and technology and we're going to make sure CANTO is around for another 35 years."

The theme of the AGM and the conference - *"Transitioning to a Digital Region – Opportunities and Challenges"* - will be examined in this issue of Cancion, as our team of writers look at security, infrastructure, training, leadership, competition and other issues important for adapting to a digital future.

Editorial (Español)

Dando un paso enérgico hacia el futuro. El 2019 será un año emocionante.

A medida que la demanda de servicios de TIC en el Caribe continúa estallando, los gobiernos y el CARICOM están tomando medidas para adaptarse a la nueva realidad.

Este último está trabajando hacia un Espacio Único de las TIC, que se denomina “la capa digital del Mercado y Economía Únicos (CSME) de Caricom”. Tiene la intención de unificar el desarrollo de las TIC en toda la región al sugerir legislaciones y deshacerse de los cargos por roaming, y la creación de emprendedores en este campo, entre otros objetivos.

“El espacio único de las TIC habla de la colaboración con todas las partes interesadas y de un entorno regulatorio sólido, teniendo en cuenta todas las tendencias emergentes en la tecnología. Esto es algo a lo que CANTO y sus miembros dan la bienvenida”, dijo la Secretaria General de CANTO, Teresa Wankin, en una entrevista en los medios de comunicación durante la 35ra reunión general anual de la organización en enero, celebrada en Guyana.

En la Asamblea General, la ministra de Telecomunicaciones Públicas de Guyana, Catherine Hughes, compartió los planes del país de tener a todas las instituciones gubernamentales en línea para el año 2020, establecer una legislación para facilitar el crecimiento del sector de las TIC y dar acceso a más comunidades en áreas pobres y remotas a la Internet.

En un discurso televisado a la misma hora de la Junta General, el Primer Ministro de las Bahamas, Hubert Minnis, dijo que los proyectos de TIC relacionados con el turismo estaban impulsando la inversión extranjera en el país. Dijo que su gobierno tenía como objetivo hacer de las islas un “centro de tecnología”.

Los desafíos a estos objetivos de las TIC, como se discutió en la Junta General, incluyen la necesidad de más personas con habilidades en TIC; inquietudes de privacidad y riesgos de seguridad; y tratar con servicios over the top (OTT) como WhatsApp y FaceTime.

“Los operadores han estado reexaminando y cambiando sus modelos de negocios para competir con estos servicios en línea no regulados”, dijo Julian Wilkins, en un discurso de despedida cuando se retiró de la

presidencia de CANTO después de cuatro años. “Este es un desafío importante para los operadores de redes caribeñas que realizan negocios en un entorno regulado pero compiten con OTT no regulados que ofrecen los mismos servicios”.

La Junta General también discutió proyectos para enfrentar algunos de los desafíos.

CANTO está trabajando con los ministerios de educación y telecomunicaciones públicas de Guyana y con la GSMA para llevar a cabo lo que se denominan talleres de Niñas para la tecnología, que darían a mujeres jóvenes de 15 a 18 años de edad capacitación en tecnología informática, incluida la codificación.

En la AGM, los participantes también discutieron el estimular el espíritu empresarial de las TIC en la región y la gestión de pagos y fraude. Hubo una sesión de capacitación sobre “Desbloqueo de cobertura móvil rural”, que abordó la “brecha de conectividad” en las áreas rurales.

Las conversaciones continuarán en la 35a conferencia anual y exhibición comercial de CANTO en Trinidad en julio. Desde su fundación en 1985, CANTO ha crecido de una organización de ocho compañías telefónicas a una membresía de 130 entidades públicas y privadas en 35 países.

“Creo que CANTO está fundamentalmente en el camino correcto y quiero aprovechar el buen trabajo que CANTO ha estado haciendo”, dijo el nuevo presidente, David Cox, en un discurso en la junta general.

“Creo que podemos convertirnos en el foro más grande y más influyente para todo lo relacionado con el Caribe y la tecnología, y nos aseguraremos de que CANTO esté presente por otros 35 años”.

El tema de la AGM y la conferencia, “Transición a una región digital - Oportunidades y desafíos”, se analizará en este número de Cancion, ya que nuestro equipo de escritores analiza la seguridad, la infraestructura, la capacitación, el liderazgo, la competencia y otros temas importantes. Para adaptarse a un futuro digital.



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WTISD 13th VIDEO COMPETITION 2019

CANTO's 13th Annual Video Competition Underway

'My vision of a digitally connected society' is the theme selected by the Marketing Communications Committee for CANTO's 13th annual regional video competition. The competition syncs with ITU's "World Telecommunications Information Society Day" celebrated on May 17th every year. This date marks the anniversary of the signing of the first International Telegraph Convention and the creation of the International Telecommunication Union (ITU).

The theme encourages students from 13 to 21 years to demonstrate how a connected society will impact: education, health care, transportation, energy, and entertainment legal and regulatory aspects of the connected society.

The competition is staged regionally and all CANTO member countries are encouraged to enter. Submissions received on or before May 2nd, 2019 will be forwarded to a judging panel consisting of ICT practitioners and educators.

Winners will be awarded the following attractive prizes:

1st Place

- Trip for 2 to attend CANTO 2019 in Trinidad
- Hotel accommodation plus US\$1000
- Tablet

2nd Place

- Tablet plus US\$500

3rd Place

- Tablet plus US\$250

In order to make this a regional success, CANTO urges all members to promote the competition in their respective markets and to encourage eligible students to participate. CANTO is actively seeking sponsors and partners to assist with the prizes. Should you wish to be a part of this exciting sponsorship opportunity, please contact Tricia Balthazar at +1(868)-622-5582 or email tbalthazar@canto.org

For rules and more information visit: <https://www.canto.org/wtisd-video-competition/rules/>

CANTO - committed to bringing technology to Caribbean youth!



Sometimes Challenges Find Leaders

Phyllis Reid-Jarvis

President & Executive Coach at Ultimate Potentials Corporation

...and Sometimes Leaders Find the Challenges

How many leaders are quick to admit more times than not, they allow challenges to find them? I will hazard a guess and say, not very many leaders will admit they are not proactive enough to seek out challenges.

In the previous issue of CACION, I spoke about how to Stretch your high potential leaders: Six ways to grow leaders from within. I will expand on that in this article and speak to a specific challenge too many leaders are afraid to address.

What the research on leadership show, is globally organizations are failing to develop leaders. Shocking as this may sound to you, a 2017 (Nov-Dec 2017) HBR article entitled: Turning Potential into Success: The missing link in leadership development, confirms the dire state of organizational leadership-globally.

It is one thing to think this problem is relegated only to organizations in emerging economies such as the Caribbean, Africa, South America and Eastern Europe as having this challenge. Not so at all.

When the Corporate Executive Board (CEB) conducted a study to ascertain the state of leadership in organizations globally, the results were astounding. More than two thirds of the organizations surveyed (66%) invested in programs aimed at identifying high-potential employees for the purpose of developing and grooming them to advance to more senior roles, typically to the C-suite level. Yet a dismal ROI of only 24% of senior executives report the programs to be a success. Why is this so?

The answer is not a lack of internal talent according to the authors of the study. Though, when one looks at the emerging markets, there is a tendency to say the talent is just not there. I respectfully and decidedly disagree with this statement. Where there are people, there you will find talent- ready to be developed and harnessed!

In my years of working with leaders and organizations globally, one practice that rings true to why not many leaders are proactive enough to seek out challenges is simply this: their own fear of being challenged.

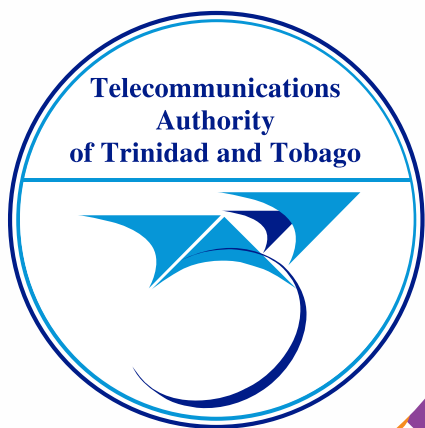
Now hear me out please. No leader wants to admit this, and I am sure you are ready to turn to the next article and dismiss what I am saying. After all, you do not fear a good challenge.

Yet, how often do you search for opportunities by practicing oversight? Looking outward, stepping away from the board room, your office, your desk, to look outward for innovative ways to improve and consequently challenge the current processes? How often do you rally your people to walk with you by experimenting, taking risks, celebrating small wins-even though you cannot give them a 'for sure' but only 'I believe this might work in our favour' explanation?

The two steps of practicing oversight and experimenting by taking risks to generate small wins are two critical components of a leadership practice, that when present, go a long way to groom talent and develop them to become more than high potential employees. These practices help them become actual leaders in their organizations and because of their contributions, make a significant difference to the overall success of their organization.

When employees see their leaders taking initiative, the research shows direct reports see them as more effective than those who practice 'business-as-usual'. The higher the rating of a leader's level of effectiveness by their direct reports, the greater the level of productivity. For leaders in the telecommunication industry, it is even more critical to practice oversight and experiment. If you are not looking for challenges, then the challenges will find you. This might be too late a time to try and turn things around. James Kouzes and Robert Posner in their award-winning book, the Leadership Challenge, describes the study of leadership as being "...about how men and women guide others through adversity, uncertainty, and other significant challenges... it's also about actively seeking to disturb the status quo and awaken others to new possibilities".

The moral of this article is simply this: Even if you are on the right track, you're likely to get run over if you just sit there. As a leader you must see outwards while looking inwards. It's the only way to better able manage the challenges when you find them and head those off that come looking for you.



Removing the Digital Divide to Treat With Disasters

Telecommunications Authority of Trinidad and Tobago

On July 1st, 2019, the Telecommunications Authority of Trinidad and Tobago's (TATT) will celebrate its 15th Anniversary. Throughout these years of overseeing Trinidad and Tobago's telecommunications and broadcasting sectors, significant focus has been placed on ultimately closing the country's digital divide.

This effort is being tackled with renewed vigor in 2019 as the need for all persons to access Information and Communications Technologies (ICTs) is becoming urgent, not only for entertainment and to connect with friends and family, but to be able to communicate in times of crisis and provide solutions to deal with the effects of natural disasters.

ICT use remains a key factor in dealing with issues related to consistent waves of calamity, some of which have been experienced by small island states like Trinidad and Tobago and other Caribbean countries.

Impact of Climate Change

According to an August 2018 article in *The Telegraph*, "manmade global warming and a natural surge in the Earth's surface temperature will join forces to make the next five years exceptionally hot".

The article states "the joint effects of climate change and so-called natural variability more than doubles the likelihood of 'extreme warm events' in ocean surface waters, creating a dangerous breeding ground for hurricanes and typhoons, the study suggests".

Added to this, an AccuWeather report dated December 27th, 2018 states "climate scientists warn that 2019 may be the warmest year on record as the result of a possible El Niño event exacerbated by man-made global warming".

These statements should be of great concern to Caribbean nations, whose economies are consistently eroded by the effects of climate change.

Within the last five years persons in the region have had to deal with unprecedented hurricanes, drought, flooding and coastal erosion.

Hurricanes Irma and Maria in 2017 left many homeless. The effects and impacts of those hurricanes in the Caribbean were evaluated and according to the January to March 2018 issue of "FOCUS: ECLAC in the Caribbean", the total estimated cost of those evaluations " ... was approximately US \$5.4 billion".

The worst floods to have hit Trinidad and Tobago in over 50 years in October 2018, left many homeless and resulted in the government disbursing over TT \$25 million in aid to affected residents.

What therefore can governments and telecommunications regulatory bodies in the region do to help our people over the coming years in the face of anticipated adverse weather conditions?

Disaster Warnings

Traditionally in the Caribbean, the public receives warnings about severe weather via newspapers and radio and television broadcasts, based on information from emergency management organizations.

Today, Early Warning Systems (EWS) are effectively being used to alert communities about predictable natural disasters, helping to reduce economic losses, mitigate injuries, deaths and help individuals protect their properties.

Such systems include monitoring and predicting components that can generate information to be disseminated to communities under threat, through multiple communication channels.

A report published by Trinidad and Tobago's Office of Disaster Preparedness and Management on its websites, cites various types of EWSs including:

- Rain and river gauges with electromechanical transducers provide signaling automatically transmitted to a central computer
- Satellite weather tracking systems globally transmit in real time on weather channels and rebroadcast by local television and cable service providers, for early consumption and evasive action by threatened populations.

The effectiveness of these technologies is amazing, however it will be tragic if information generated and transmitted by these technologies is unable to be received by residents in communities where the digital divide has not yet been bridged.

Worse if these affected residents are unable to benefit from relief supplies, rescue operations or evacuations, if this became necessary.

Easy Access to Money After Disasters

One of the other challenges faced by persons in remote communities, is the inability to conduct transactions at financial institutions situated in distant urban centers.

This challenge becomes even more grave in periods following disasters when small communities can be physically disconnected from urban centers because of flooding, landslides and other scenarios that inhibit free movement.

Residents who have run out of cash and may not possess bank cards or credit cards but need to purchase food and other necessary supplies for the home, can be greatly inconvenienced at such times.

One solution that has been working very well in some nations on the Continent of Africa, is mobile money, an ICT enabled service, which allows economic activity to flourish in communities where the Internet is accessed, but where there are no formal financial institutions.

According to a 2017 Food and Agricultural Organization publication titled "e-agriculture" countries such as the Democratic Republic of Congo, Egypt, Ghana, Kenya, Lesotho, Mozambique, and Tanzania use M-Pesa.

M-Pesa was launched in 2007 and is designed to safely send, receive and store money using the simplest of mobile phones which therefore must be connected to the Internet. The service also allows customers to make bill payments and top-up airtime.

The proliferation of phones in communities where M-Pesa is used, provides a ready information dissemination platform in times of disaster.

A 2012 study titled "The role of mobile phones in emergency and disaster management in Kenya", published by the University of Nairobi Digital Repository, found that there has been "a steady integration of mobile phones in emergency and disaster management, through mobile-phone based cash transfers for vulnerable populations, fundraising for emergency kitties and as a means of getting emergency support services to crisis populations".

Similar services may be considered for the Caribbean, to help residents of remote communities, not only access money under normal circumstances but also to receive information in times of crisis.

Remove the Divide

The weather outlook for the foreseeable future appears grim, consequently access to the Internet and other ICTs, in areas where a digital divide still exists, must be considered an urgent need.

In Trinidad and Tobago, the Telecommunications Authority of Trinidad and Tobago (TATT) is working on implementing solutions to close the digital divide and thus increase the use of ICTs.

Development of an implementation plan for the provision of broadband Internet access services to underserved areas is underway. The current focus is on amendments to the Telecommunications Act and to the Universal Service Regulations, that will provide the legislative strength to accomplish plans associated with further narrowing the country's digital divide.

These plans include the complete roll out of a National Wi-Fi initiative that will result in a wider cross section of the public accessing the Internet in public spaces, such as at the national libraries and on public transportation services.

Conclusion

The World Economic Forum, Insight Report, Global Risks Report 2019 states in part "2018 was another one of storms, fires and floods". That report noted the Intergovernmental Panel on Climate Change (IPCC) bluntly said in October 2018 that we have at most 12 years to make the drastic and unprecedented changes needed to prevent average global temperatures from rising beyond the Paris Agreement's 1.5°C target.

Unless the prevailing conditions change, severe natural events will feature in this region for some time. Critical therefore is the need for efforts to further narrow the digital divide so that all our people can utilize the Internet and other ICTs, to better prepare for natural disasters and access timely post disaster assistance.

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Digital Kidnapping, Privacy & Child Online Protection

Shiva Bissessar

Managing Director - Pinaka Consulting Ltd.

Digital or virtual kidnapping is a term which enjoyed heightened interest around 2015/16 mainly in the US, in part due to the phenomenon being featured on the popular daytime reality show Dr Phil.

The act itself describes taking shared photos of someone and creating a false narrative around those photos. The affected photos may be of children, which have been shared either publicly or within a restricted group of 'friends' on social media by their parents.

Someone with legitimate access to the such photos, perhaps a member of the general public or a person within the parents' social media 'friends' or 'friends of friends' listing, then takes the photos and misuses them.

It is similar to, and can be considered a form of, 'catfishing', where alternate personas are created (by a perpetrator), using pictures of real people (victim), with the intent to foster relationships with other persons.

In catfishing the perpetrator assumes the identity of the adult victim, by using their profile picture, on a social media platform.

In the case of digital kidnapping however, the victim would be considered the affected children and perpetrator doesn't assume their identity, they create an alternate reality, which can consist of fake captions, comments and stories accompanying the posting of the child's pictures.

The perpetrator shapes a fantasy in which they control the false narrative constructed with the appropriated children's photos and it's not unknown for the perpetrator to claim the child as their own.

"Parents excessively sharing details of their children's lives on social media, 'sharenting' can lead to unintended consequences for children."

Shiva Bissessar

If this by itself is not alarming enough, some perpetrators build the narrative into an active role-playing scenario with the appropriated children's photos in which they invite others to further develop the fake storyline and participate in their fantasy further via comments.

Privacy Please

At its core, this issue is one of privacy and it underscores the need to be ever vigilant of the 'digital footprint' being left behind on social media; particularly as it relates to children.

The phenomenon of parents excessively sharing details of their children's lives on social media is now known as 'sharenting', which can lead to unintended consequences for children, who have no say in the matter and end up having an inordinate amount of the details of their lives being shared online.

Indeed, the issue demands education, awareness and sensitization of the general public of the risks involved in sharing private and personal information on social media.

This role-playing development has flourished on the popular photo sharing app Instagram where photos designated by perpetrators for others to participate in such role-playing carry certain hashtags such as #AdoptionRP, #KidRP, #BabyRP and #OrphanRP.

The Child Rescue Coalition, which advocates for greater privacy for kids via greater sensitivity by parents in sharing pictures of their kids, has created an Instagram account called @kidsforprivacy which highlights a listing of other hashtags that parents should avoid using when sharing pictures of their children as it may invite digital kidnapping and role-playing.



Child Online Protection

Child Online Protection (COP) programmes have been developed by international agencies such as the International Telecommunications Union (ITU) with the intention of addressing various aspects of child online exploitation including more dangerous acts such as the creation of child sexual abuse material. The ITU has produced and makes available COP guidelines for various stakeholder including;

- Children
- Parents, Guardians, and Educators
- Industry
- Policy Makers

The ITU website further lists a hosts of country profiles with respect to COP where Trinidad and Tobago has been deemed to satisfy certain requirements under the classification headers of; National Legislation (The Children's Act, 2012), UN Convention and Institutional Support (eConnect and Learn Programme Policy & aspects of the National School Code of Conduct).

A 2017 report by the Commonwealth Internet Governance Forum, the Children's Charities' Coalition on Internet Safety and the International Centre for Missing and Exploited Children (ICMEC), titled "A Joint Report on Online Child Protection Combatting Child Sexual Abuse Material on the Internet" recognizes Trinidad and Tobago as satisfying four out of five ICMEC criteria. The ICMEC criteria forms part of an assessment of legal frameworks globally to determine if national legislation:

- Exists with specific regard to child pornography;
- Defines child pornography;
- Criminalizes computer-facilitated offences involving child pornography;
- Criminalizes the knowing possession of child pornography regardless of the intent to distribute; and
- Requires Internet Service Providers to report suspected child pornography to law enforcement or another designated agency.

The report, while explicitly focused on child sexual abuse content, notes that Commonwealth members may deem it necessary to examine a more expansive set of online child safety issues including ensuring that: "children and young people themselves are aware of a range of hazards which exist on the Internet e.g. exposure to age inappropriate but legal content, exposure to unscrupulous commercial practices, the risk of Internet addiction and, hugely important for young people of school age and others, the risks associated with various forms of online bullying". These other aspects must therefore form part of any COP programme.

Tackling the issue of online or cyber-bullying, something with high potential to impact children in a significantly negative way, remains a very contentious point in the development of cybercrime legislation in Trinidad & Tobago, as discerned from the Joint Select Committee Report on Cybercrime Bill, 2017.

Unfortunately, much of the focus has been how publishers and broadcasters are impacted by the cyberbullying provisions while advocacy for children protection under such provisions hasn't received similar attention.

The ITU also presents a host of links to resources where further information and guidance on COP can be found.

To take full advantage of this and other resources, however, would require a national coordinated effort towards development of appropriate education, awareness and sensitization programmes and subsequent meaningful interaction with key stakeholders across various Ministries and agencies including the Children's Authority, the education system and Ministry of National Security.

Recommendations & Conclusion

Some of the general rules to follow in increasing privacy on social media includes:

- Be cautious in what you share and monitor what your family members and friends are posting as well as how frequently.
- Know your privacy settings and limit access to pictures of your children, this could include making sure profile pictures, cover photos, etc. aren't publicly viewable.
- Turn off geotagging on photos and make the relevant setting to remove EXIF information, which includes GPS data, from your smartphones and digital cameras to protect your location information.
- Consent is integral and sharing of photos and tagging should not be practiced without getting permission from others who are being included
- Everything you post online can potentially remain there permanently, hence be selective in what is shared; things we laugh at today can be deemed a complete lack of judgement later.

Attention to digital kidnapping and privacy concerns underscores the need to respond to the more pervasive threat of exploitation of children on the Internet via implementation of COP programmes.

The impetus in Trinidad & Tobago towards this goal should be high, as earlier in January 2019, a public hearing of Parliament's Human Rights Equality and Diversity Joint Select Committee heard testimony highlighting that of 69 child pornography reports being received by MoE over the past five years where "67 per cent of the 69 cases were girls involved in child pornography."

An integral part of the response at the national level to such a threat would be the development of cyber-awareness programmes for children and key stakeholders including students, parents, teachers

and caregivers to highlight the pitfalls of social media and need for individuals to protect their privacy, and indeed protect children, from all forms of exploitation on the internet.

Commitment to COP requires that timebound objectives be established and observed. Additionally, the issues of leadership and funding are also paramount towards achievement of expected COP outcomes. A coordinated approach across key Ministries, departments and agencies and other key public and private stakeholders is required.



Education, Awareness & Sensitization Is Key

Industry participants would have a role to play in assisting COP initiatives at various stages including policy development and sensitization campaigns with the general public. Telecommunications providers, Internet Service provider (ISPs), Publishers and Broadcasters and their regulatory body need to be onboard with such initiatives providing leadership, guidance and funding.

Participation of experts and civic groups would also be necessary towards the production of meaning educations, awareness and sensitization programmes to promote COP.

CybersafeTT has worked with the Telecommunications Authority of Trinidad & Tobago (TATT), and on its own, in providing education, awareness and sensitization interventions to school children in relation to COP; however, an updated and more formal and permanent effort towards COP is required.

Shiva Bissessar, Managing Director of Pinaka Consulting, working with an international agency, has developed a programme designed to canvass all secondary schools in Trinidad and Tobago as part of an intensive cyber-awareness and sensitization campaign. This proposal has not been executed due to lack of commitment to funding.

CANTO 35th Annual General Meeting Opening Ceremony



Master of Ceremonies, Wendell Etienne



Opening Remarks, Mrs. Teresa Wankin
Secretary General - CANTO



Chairman Remarks, Mr. Julian Wilkins
Chairman - CANTO



Host Remarks, Mr. Justin Nedd
Chief Executive Officer - GT&T



Address by, Hon. Patrick Pengel
Minister of Public Works, Transport
& Communications



Featured Speaker, Hon. Catherine Hughes
Minister of Public Telecommunications
addresses the delegates



Kreative Arts Dance Group

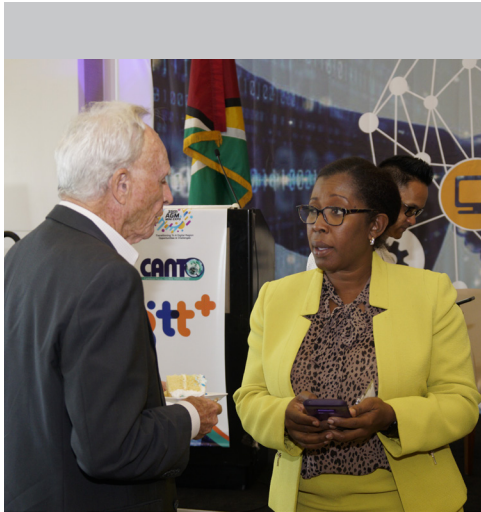


Vote of Thanks, Mr. Charles Carter
CANTO Director



CANTO Board of Directors
with Ministers

CANTO 35th Annual General Meeting Highlights



CANTO 35th Annual General Meeting Highlights



CANTO 35th Annual General Meeting Highlights

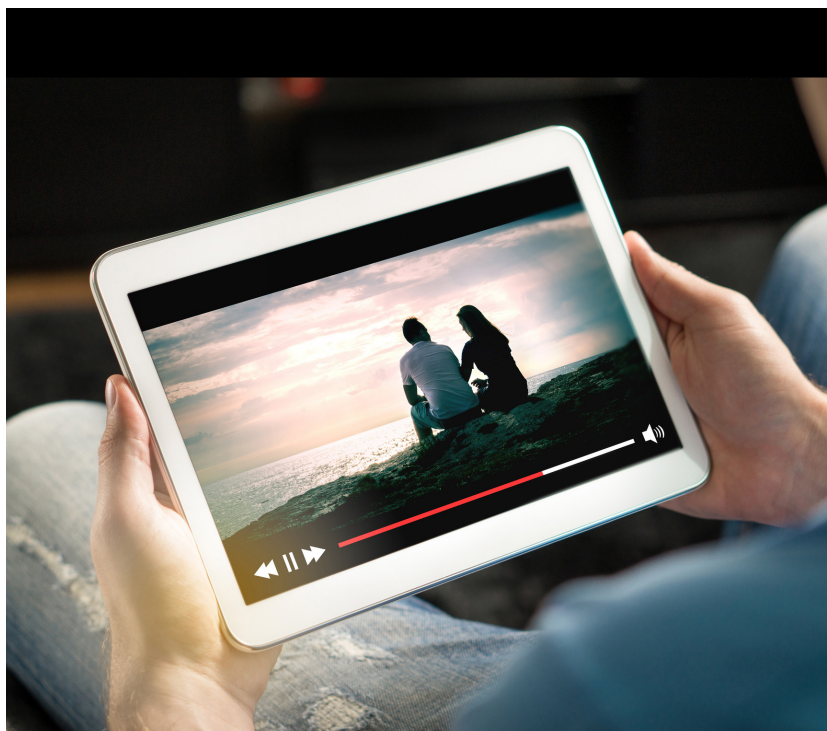




Your Trusted Partner for IPTV Deployment

Scott Argue

VP Client Services, SaskTel International



SaskTel International is helping service providers stay competitive in the communications industry while meeting strategic objectives. SaskTel International has access to SaskTel's pool of 3,900 employees and unparalleled experience to help your business provide Internet Protocol Television (IPTV) services.

Over the last 17 years, SaskTel has grown to 113,000 **maxTV** subscribers through continued investment and innovation in its full-featured IPTV service.

SaskTel is a leading IPTV service provider in North America. In a competitive market, it is essential for service providers to stay connected to customers who are choosing flexible internet-based service delivery over traditional cable and digital broadcast services. Customers subscribing to an IPTV service have the flexibility to watch their favourite shows and content from the comfort of their home on any internet-enabled

device, including tablets, smartphones, and laptops. By enabling subscribers to stream content over the internet, viewers are no longer limited by location-based infrastructure and TV hookups.

SaskTel began its journey to becoming an IPTV service provider in 2002 when it unveiled fully-digital **Max™ Interactive Services**. In 2006, **maxTV** became the first IP television service in North America to offer High Definition (HD) programming and shortly after introduced digital television recording. More than a decade later, in 2013, SaskTel achieved milestone success with over 100,000 **maxTV** subscribers. Today, SaskTel has 113,000 subscribers and plans to expand the service into new communities.

SaskTel owns and operates Saskatchewan's largest network that connects 99% of the population over an area of 651,900 square kilometres. SaskTel is able to deliver and expand IPTV services over its broadband network into rural areas and reach an additional 100,000 new households across more than 350 communities by 2020.

In 2017, SaskTel partnered with global leader Ericsson to adopt the Ericsson MediaFirst solution suite to transform **maxTV** into the best-in-home and on-the-go IPTV experience. IPTV combines the best of traditional television with advanced features and the latest over-the-top (OTT) content from Netflix and YouTube.

IPTV has positioned SaskTel at the leading edge of TV innovation. SaskTel is able to get the most out of its product and service investments to continually evolve **maxTV** services as customer preferences and habits change over time. With IPTV, SaskTel has become a multi-play provider that can bundle services to create better overall customer value and retention. Staying up-to-date with technology advancements has allowed SaskTel to be recognized as an ambitious innovator in the telecommunications industry.

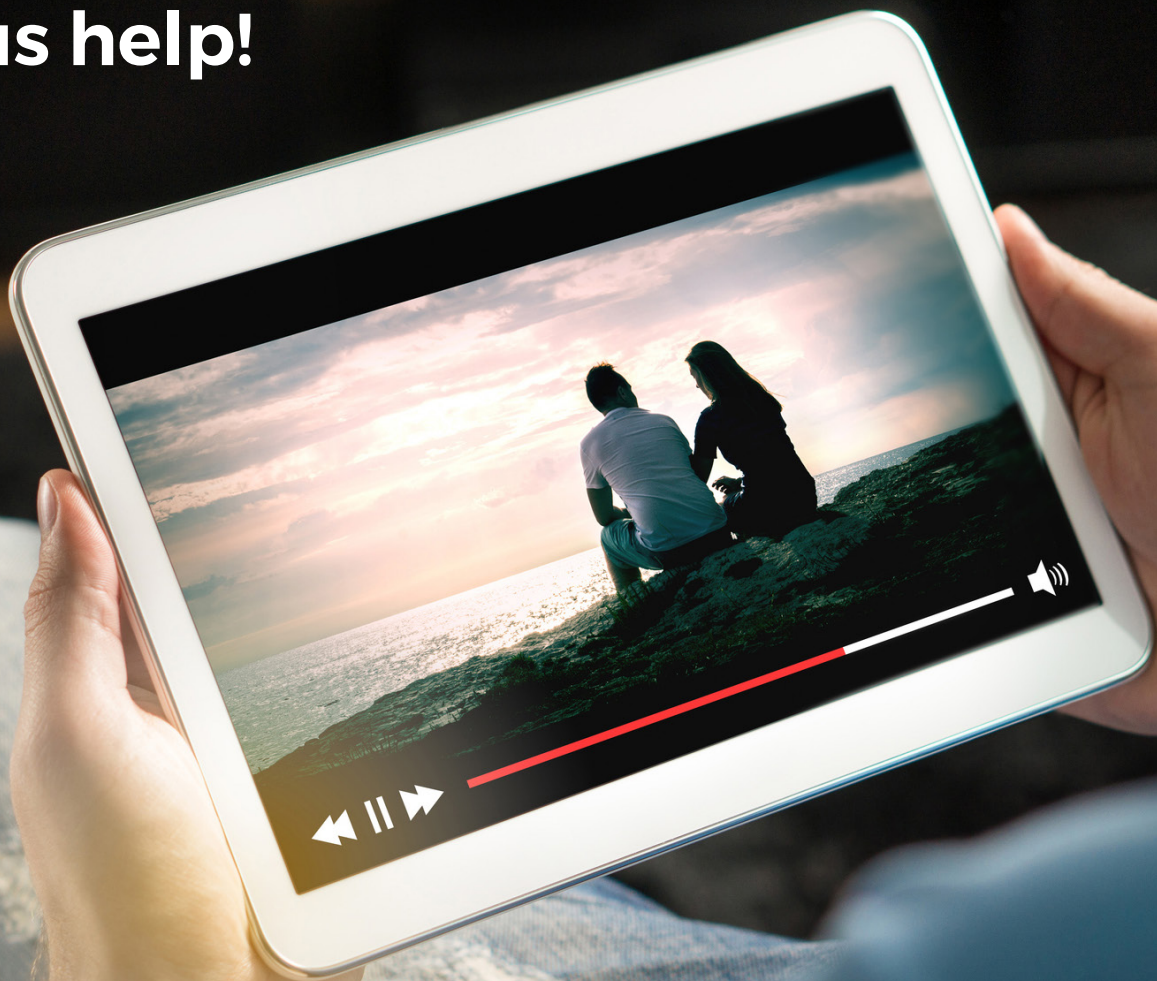
Loaded with over 130 channels to choose from, thousands of hours of Video-on-Demand (VOD) content, and downloadable apps, **maxTV Stream** raises the bar for television and entertainment with its innovative features, such as:

- Restart TV: Restart select programs up to 72 hours after they have aired.
- **maxTV App**: Watch live TV and VOD programming on your smartphone or tablet.
- Built-in Applications: Easily access Netflix, YouTube, and other apps available in the Google Play Store directly from your media box.
- State-of-the-art equipment: Control your TV like never before with Bluetooth and voice command technology.
- Bundling: Customers bundle IPTV service with existing cellular, internet, home phone, long distance, and home security services as a cost-incentive.

SaskTel International is a wholly-owned subsidiary of SaskTel providing software and professional consulting services worldwide. SaskTel has over \$1.2 billion in annual revenue and approximately 1.35 million customer connections globally including 113,000 **maxTV** subscribers, 611,000 wireless accesses, 338,000 wireline network accesses, and 283,000 internet accesses. SaskTel International has access to SaskTel's pool of 3,900 employees and unparalleled experience to help your business provide IPTV services.

If your business is looking to transition into an IPTV provider, SaskTel International can help. For more information **e-mail info@sasktelinternational.com** or visit our **website www.sasktelinternational.com**.

Transitioning to IPTV? Let us help!



It is essential for service providers to stay connected to customers who are choosing flexible Internet-based service delivery over traditional cable and digital TV services.

For over 32 years, SaskTel International (SI) has been working with service providers, delivering software and trusted advice to help them enhance their business. Over the past 17 years, our parent company, SaskTel, is a leading IPTV service provider in North America with their successful launch and rapid growth of their full-featured IPTV service. SI can provide consulting services to help drive your IPTV project, leveraging SaskTel's successful and extensive experience.

For more information on how SI can help you plan and transition to an IPTV provider, visit our website at www.sasktelinternational.com, or contact us at info@sasktelinternational.com.



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What's Next After Connectivity?

David Stokes
ECI's Portfolio Marketing Team

Originally published by ECI: <https://blog.ecitele.com>

How to Drive ROI From Your Fibre Network Investments

Across the world many network operators, fibre network wholesalers, municipalities and local authorities are in a race to put fibre in the ground. New techniques and specialized tools have reduced the time it takes to deploy optical fibre and increased the amount of fibre held in a single duct, this makes the dream of providing fibre to every premise a cost effective reality.

However, achieving fibre connectivity is just the first step. The next, more complicated, step is deciding how to best monetize the investment in this fibre infrastructure. This fibre infrastructure is not just about providing high capacity fibre to the home for residential use. There are many other services where the high bandwidth connectivity provided by fibre is absolutely essential:

- **5G–** requires significantly higher radio capacity and radio connection density than 4G. This, in turn, means an explosion in fibre connectivity to provide the transport connectivity for these radio resources. For 5G to reach its full potential this transport connectivity needs to be extremely agile, providing the ability to offer dynamic network slicing
- **Utility and Transportation Modernization–** All utilities and transportation networks are in the process of updating to a modernized, digital communications and control network. As part of this modernization a vast number of sensors and actuators will be deployed, high quality video will be the norm for surveillance and security, and operational technology (OT) and IT will be combined (or converged). To achieve this, a new communications infrastructure is required based on fibre connectivity. This communications infrastructure must have be flexible enough to support the thousands of mission critical sensors/actuators (IoT), the huge bandwidth required for high quality video and the security required to allow IT and OT to be combined.
- **Smart Cities–** Smart cities range from small projects like smart lighting and smart buildings, to law enforcement, full integrated

transport/parking/shopping and fully integrated cities. Real-time IoT connectivity is required to make this a reality and this requires a new, secure, communications network to connect the 10,000s of devices. This transport must be agile enough to adapt and scale as new solutions and systems are added to the smart city.

- **Next Generation Business Services**– A new generation of business services are evolving, based on cloud services. This requires new high capacity, highly reliable connectivity from the enterprises to the cloud data centers, and back.
- **Bandwidth Increases**– With the planned ubiquitous availability of Gigabit-capable networks, broadband speeds in general are increasing. Fibre based transport networks are the only way to achieve this scalability and this opens the opportunity for dark fibre wholesale and wavelength connection services.

These new and modernized service areas provide traditional network operators with the opportunity to access new revenue sources. In many cases it also provides a unique opportunity for them to move up the value chain by offering value added services on top of the connectivity (e.g. security, location based services, data analytics, storage, etc).

Independent network operators, municipalities and local authorities have these same opportunities, however they have the added complication that their networks are not countrywide. So to enhance their value proposition they could federate with each other to offer a ubiquitous wholesale network for delivering end to end interlinked services.

For network operators, traditional or independent, to take advantage of the revenue opportunities offered by these new and modernized services they must build a transport network that is able to use the fibre network

to offer each of these services as required. This is no mean feat as each of these service areas has different needs in terms of security, latency, capacity. Moreover, each service is evolving at a different rate.

The traditional approach has been to build a separate transport network for each service type. However, this is expensive, fails to provide the agility required to support new services rapidly and does not use the available transport capacity efficiently. A better approach is to use new transport technology like SDN (Software Defined Networking) and NFV (Network Function Virtualization) to offer a flexible, multiservice transport platform able to support all of these service types. SDN used in conjunction with NFV provide the operator with the agility to offer capacity and functionality wherever it is required to best support each service. This agility also means that it is easy to rapidly add new services, allowing the operator to react to new customer demands and opportunities in near real-time.

Final Thoughts

In the near future we may see quite different operations models where everybody moves up the value chain. With municipalities and local authorities offering fibre connectivity rather than just physical locations for equipment. Independent operators would compete with traditional operators on providing connectivity services and both traditional and independent network operators would look to broaden their scope to move up the value chain by offering value added services.

However, we cannot ignore the impact of the over the top players who are also looking at these new revenue sources with interest. With Google, Amazon, IBM already looking at how they can provide “smart cities”, is it too much of a stretch to see the “Google Emergency Services Network”?



Supporting Your Employee's Career Goals!

Janice Sutherland

Sutherland Coaching and Consulting

Your team would have greeted the new year full of resolutions and goals. Some of which would be related to their career, how they can be more upwardly mobile or reach for a new aspirational role within your organization.

As a leader, that should be music to your ears. This means your team is engaged, they're happy with your organization and motivated on getting the job done. This in turn brings you the added benefits of aiding staff retention, reduced recruitment costs and retaining the valuable knowledge that your employee has accrued or developed within your business. The challenge, however, is how do you support those employees with their endeavors so they remain motivated to attain their goals? Secondly, how do you get past the responses I often hear from leaders in providing that support e.g. there's no budget for learning and development (in my opinion a short sighted response but that's another topic), the business is far too stretched to allow time for development (what no time to improve your business performance? Yet another discussion)!

It doesn't have to be costly or time consuming and it's easier than it sounds once you find your rhythm. The outcomes are a win/win for you and your team - your team feel valued and are engaged and you reap the benefits in productivity, attendance and quality output.

Here are some ideas that you can utilize with minimal budget impact but maximum returns as you support your team to reach their best self.

1. One to Ones

Best practice dictates that you would have been regularly conducting appraisals or performance/development reviews with your team. So before the business and everybody settles into business as usual, conduct a 121 update with each team member making sure that their current development plans reflect their future endeavors and ensuring that your organizational development plans are totally up to date. Knowing that a team member has managerial aspirations or would like to learn additional skills in another department enables you to future proof your business and agree on how you can support them.

2. Study Time

The second thing is to actually provide employees with time for personal development. A good rule of thumb would be to allow 10% of their time for personal, professional growth. However, I know that could be challenging for a small business but even if it's just an hour, once a week that they

could devote to expanding their knowledge or aiding their development, that would be a start. It's about building a skill which could positively impact your business, improve morale, their leadership abilities and make your annual appraisals less fraught. If that's still impossible, try turning a standing meeting into a study period for all staff involved - we all know of meetings we feel are a waste of time, why not change that?

3. 90 Day Development Plans

Just a reminder, when I refer to annual appraisals, the achievement of goals or lack thereof shouldn't be a surprise at year end. So within your appraisal or personal development process, I recommend the introduction of 90 day personal development plans. As the name discloses, these are typically 90 day development goals and can commence when your team return to work. So encourage everyone to have a 90 day goals plan and to share that with you and maybe some of their team members. Enhance the process during team meetings and look at ways you can actually commit to helping them. Discuss ways the team can help each other to achieve both individual and organizational learning, making it fun to share where progress has been made via their team members and with yourself.

4. No Budget for Learning?

Not all the learning has to be about online courses, going away to school or attending conferences, you could look at more innovative ways of actually developing learning. You'd be surprised at how excited an employee can get when they have something different to do. It could be just spending a day in a different department, shadowing somebody, a back to the floor experience, getting involved in a project they normally wouldn't be involved in. You can make it as innovative or as challenging as you like, it just needs to differ from the everyday job and be inline with both parties objectives.

5. The Power of Mentoring

If your employee has expressed leadership aspirations, we all know that the reality of leadership versus the desire can vary dramatically (I know you make it look so easy!). Once you've discussed and identified their development needs, utilize your one to-one sessions to coach. If possible, encourage them to actually identify and approach someone within your business to be their mentor. Not only is this a great experience for the mentee, it's also great for mentor managers aiding their own personal development and competency building.

6. Maximize the Return on Your Employee One to Ones.

Be honest, how present are you during your one to ones? I don't just mean physically present but mentally present? In my experience (I've been guilty too) we're in the room but we're either answering emails, distracted taking phone calls or fielding off interruptions. How much more impactful for you and your employee if the next time you have a one to one, you really give them your full attention? It's the difference that will really make the difference, so next time be prepared and present. Don't second guess the discussion, just ask them a couple of simple questions - What skills are they looking to develop? How can you help and support them in their goals? Then turn your phone to silent, close your laptop, shut up and listen. Give them the respect of your full attention.

7. Peer Partnerships/Job Swapping

A really simple exercise is the use of peer to peer learning, utilizing team meetings so individuals can share their experiences with people who have had similar challenges. It can be incredibly powerful and encouraging to hear of the experiences of relatable people. It not only promotes learning through cross-skilling but encourages team building and cohesion.

There it is, but with all this people development you may be thinking 'What if all I'm doing is helping my best team members plot their departure?' Trust me, this level of support is something great employees remember, appreciate and value. Making sure you're genuinely connected with all their development needs so that you can actually help them means you're helping to future proof your business and building an engaged workforce.

One more tip I'd share based on experience. If you are unable support their development within your business once you've heard their career aspirations in your 121's, (I've had people training to be pilots - very little synergy in a call centre) you can be upfront and honest about it. Never be afraid to lose an employee because their aspirations out grow where you are in the business right now. The fact you're open to providing support creates a fabulous working culture and leaves a lasting memory. Let's be honest you want them to remember that you were willing to support their endeavors as you never quite know where you'll meet them again on their way up.

Education Technology and the Single ICT Space

Jayme Hoyte & Theon O'Connor



Our personal life is highly dependent on the technology that people have developed. Technology has advanced with years and it has changed the way we purchase products, the way we live, communicate, travel, learn and so many changes have been brought about by these continuous technological advancements. In an attempt to stay abreast with these technological changes, the Caribbean Community (CARICOM) is making moves to transition the region into a digital economy by way of creating a Single ICT Space.

The Single ICT Space is the digital layer of the CARICOM Single Market and Economy (CSME). The Single ICT Space will allow for harmonization of the ICT and other legislative frameworks, the removal of roaming charges, the encouragement of digital entrepreneurship, equipping all citizens as digital citizens and looking at ICT financial solutions among other regional benefits. CARICOM Heads of Government approved the Road map for the Single ICT Space in February 2017 and has thus made significant regional progress with countries getting on board.

Looking at this digital fragment of creating a Single ICT Space persons will now have access to online public services such as health, education, taxes and connecting other programs and policies to transform the community. With recent Education Technology advancements and Education being the foundation of society this is one aspect of the Single ICT Space many are looking forward to. The Association for Educational Communications

and Technology (AECT) defines Educational technology as the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources. As most institutions are going digital and benefiting from the power of automation, analytics, and now blockchain so to the region must dynamically upgrade.

Today, some of the most widely used technology in education spans across both software and hardware technologies which may include; School Management Systems, Learning Analytics, Games and Gamification, Virtual and Remote Laboratories, 3D Printing, Touch Tables and Boards. While the nature and application of these systems may vary, one thing remains common among them, the ability to empower students and teachers and to provide valuable insights to governments across the region.

Creating a single ICT space for education in the region is not as simple as it sounds, but for this to be completely effective a sequence of decisions has to be made. Through research and understanding of the objectives for a Single ICT Space put forward by CARICOM, SmartTerm sees the success for education through the following stages;

Education Management Software- Heads of Government within CARICOM need to agree on a robust Education/School/Learning Management System. This will form the creation of a single space for all education stakeholders to operate within. Ministries of Education, schools, teachers, parents, students and any other additional services, for example, police, ambulance or firefighting services can be engaged on an Education Management System.

National Roll-out within CARICOM Countries- Ministry of Education across the region, once agreements have been made on one single platform, has to allow for the accessibility of the system and make it mandatory for all schools within the country. This can be carried out through country-block phases with the aim of having all schools optimizing the system.

Onboarding and Training- As schools and students are enrolled, a robust Education Management Platform should be able to conduct teacher training via online materials or live seminars within the platform. The system having all features needed to create a Single ICT Space for education while allowing for customization by country and school is key.

Monitoring and Evaluation- In everything you do there must be monitoring and evaluation. You would want to know how effective a particular system is and in meeting the goals of the Single ICT Space? How are stakeholders interacting with the system? Is it doing what it says it will do? Is learning improving? And how can we be sure? These are some of the questions your Education Management System within a Single ICT Space should be able to answer.

How will Education Technology be useful in a single ICT CARICOM space?

Analytics is a major piece of the puzzle to this question as data can be shared and used across all institutions, across all countries.

This lends itself to better decision-making as governments across CARICOM search to find solutions to pressing educational challenges. Here we have combined some important benefits to all the major stakeholders:

| Regional Governments | Schools | Teachers | Students & Parents |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Regular communication with schools. | Administrators are able to manage the infrastructure at their respective schools completely digitizing data at the school. | Teachers are able to completely manage their classrooms online and have access to insights that can help them improve teaching and learning in the classroom. | Able to access resources online and engage with their respective classrooms online. |
| Regional/National Alerts | Data Security, Searchability, and Reliability. | Provide on-demand lessons and other resources. | Increase parental involvement. |

| Regional Governments | Schools | Teachers | Students & Parents |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------|
| Analytics across all schools. | Increased efficiency. | Assessing student's learning styles, leading to personalized learning. | Improved student engagement. |
| National Curriculum control to ensure the latest topics are being taught. | Cost savings - printing, content creation, and enrollment. | Regional Content and resource sharing. | Access to unlimited learning resources. |
| Quickly pinpoints and help underperforming schools. | Resilience in the event of hurricanes and other disasters. | Digital Reusable Content. | Regular progress updates. |
| Quick generation of Executive Reports. | CXC integration. Students will be able to register for CXC examinations, check results, access timetables, and access sample e-tests. | Grades and Report Generation. Regional comparisons. | Digital Transcripts. |
| Custom modules for specific country need. | Competency tracking for TVET/CVQ | Attendance Tracking | Competency. |
| Easily transfer students between country and schools. | Through AR and VR school's resources become easily available. | Lesson Plans | Personalized Learning. |
| Maintain an accessible record of student data from primary school all the way to post-secondary. | | | |
| Through machine learning, the workforce can be shaped. | | | |



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High Performance Mobile Web Frameworks are Replacing Websites and Native Mobile Apps.

RB Tewksbury

Republished from: <https://docs.google.com/document/d/1R0pHrH8gpkU2uj3D-fIYsM5MtFFikltMtqhAiCuKz10/edit>

Two technologies you've probably never heard of are transforming the web and how we use it. Google's new .app top-level domain provides peerless security and speed by default. Progressive web apps may be the most significant advance in mobile web technology since Apple's release of the iPhone on June 29, 2007.

On March 26, 2018 Google began rolling out its mobile-first index saying they "started migrating sites that follow the [best practices](#) for [mobile-first indexing](#)."

Google's estimated share of global search engine market August 2018: 77.7%.

Google is also the largest recipient of online advertising dollars, with an estimated 37% of total online ad spend in 2018 -or \$42 billion in U.S. ad dollars.

Entrepreneurs that lack a mobile-first web strategy are at a competitive disadvantage to those who fully embrace mobile. Secure top-level domains like .app and progressive web apps are replacing traditional websites and native mobile applications. This is where the web is heading next.

.app Domain Names

There are [more than 1,200 top-level domains](#) -also know as TLDs, available for registration. The most common generic TLDs include .com, .net and .org. There are country code top-level domains like .us for the United States, .uk for the United Kingdom and .io for the British Indian Ocean Territory. There are restricted TLDs for example .bank for financial institutions, .gov for U.S. Government and .mil for the U.S. Department of Defense.

Now there's .app ... an important new unrestricted top-level domain [backed](#) and [managed by Google](#). According to Google Tech Lead and Senior Software Engineer Ben McIlwain, .app is ...

"the world's first entirely secure all HTTPS open top-level domain" [Google states](#) "A key benefit of the .app domain is that security is built in—for you and your users. The big difference is that HTTPS is required to connect to all .app websites, helping protect against ad malware and tracking injection by ISPs, in addition to safeguarding against spying on open WiFi networks. Because .app will be the first TLD with enforced security made available for general registration, it's helping move the web to an HTTPS-everywhere future in a big way."

In February 2015, Google paid a then record-setting \$25,001,000 to The Internet Corporation for Assigned Names and Numbers ([ICANN](#)) for the registry rights to the .app TLD. The company launched .app at [Google I/O 2018](#).

From a [post](#) on Domain Name Wire on May 7, 2018 ... *"This morning, GoDaddy VP Paul Nicks confirmed to DNW that .App is its biggest new top level do main launch to date in terms of pre-orders at the registrar. Every day of early access has beaten the same day of other new TLD early access periods, and it has more pre-orders than any other domain."*

More than 250,000 .app domains were registered in the first month of availability.

.app is an excellent top-level domain choice for entrepreneurs and small business owners - offering better user experience opportunities and private, secure B2C communications.

Domain names are not purchased, they are registered. To register a domain name you use a domain name registrar like Godaddy. Registrars either own the rights to a specific top-level domain -also making them the registry for that TLD. Or they acquire those rights from the rightful owner. Think of registrars like retailers. These retailers get their TLDs from wholesalers called registries. The registries acquire their rights to a specific TLD directly from ICANN.

"... the Internet Corporation for Assigned Names and Numbers ([ICANN](#)) helps coordinate the Internet Assigned Numbers Authority ([IANA](#)) functions, which are key technical services critical to the continued operations of the Internet's underlying address book, the Domain Name System (DNS)."

As with other TLD extensions like .com or .net, your desired .app domain name may already be registered. Do not wait. Even if you have no intention of building a progressive web app anytime soon. It's a good idea to secure your .app domain(s) right now. New domain names can be registered at [Google](#), [Godaddy](#), [Donuts](#), [Hexonet](#) and most other domain registrars. Domain name registrations fees vary by registrar so it pays to shop around.

Mobile Applications

Mobile apps -also referred to as native applications, are designed and optimized to run on mobile devices such as smartphones, tablets and watches. The vast majority of us use mobile apps all day, every day. Mobile

apps are most often searched for, found, downloaded, installed and/or updated directly from [Apple's App Store](#) for iPhone/iOS devices or from [Google Play](#) for Android devices.

The Web and our mobile devices have changed dramatically since Apple launched the iPhone nearly a dozen years ago. Today, more people access and search the Web using mobile devices and smartphones than those using desktop computers.

Google is by far the dominant moving force in mobile technology today. The company's mobile operating system Android powers around 60% to 65% of mobile devices in the U.S. and 85% or more of the world market. All of these mobile devices have Google accounts. Apple's share of the smartphone market in the second quarter of 2018 was approximately 13% in the U.S. and 11.9% worldwide.

Google Play and Apple's App Store are powerful marketing and content distribution channels for app developers and content creators alike. By the first quarter of 2018 there were about 3,800,000 Android apps available on Google Play. There were approximately 2,000,000 more iOS apps available in Apple's App Store.

[According to Google](#) *"Mobile apps have become an integral part of people's daily routines, with 92% of smartphone owners using apps. New research from Ipsos shows that, when done right, advertising through mobile apps is successful both at reaching decision makers and at driving action."*

There are many business mobile apps in the App Store and on Google Play. Most companies however have not yet embraced native apps for mobile marketing or for enhanced, secure B2C communication and engagement.

Businesses that have and use native mobile apps almost always have company web sites as well. This mobile marketing strategy is inefficient, expensive to develop and difficult and expensive to maintain. Mobile apps require separate application builds for each mobile platform: Android, iOS and the web. Updating content, finding and fixing bugs, releasing new features and updates and managing app version control and web servers can sometimes overwhelm even the most talented technical teams.

Many businesses have opted instead for building and maintaining mobile responsive websites. A web design concept first introduced by Audi.com in 2001. Websites like these offer limited user-engagement capabilities and are often constructed using content management systems like WordPress -first released May 2003. There is a better way ... it's PWA.

Progressive Web Apps

Progressive web apps leverage the benefits of open web standards and modern web browsers to provide users with a rich mobile experience. Progressive web apps are not actually apps at all. But instead, a mobile-web

framework for defining minimum code requirements and best practices for a better mobile-user experience.

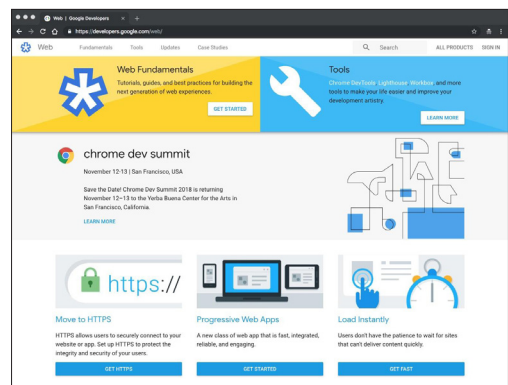
According to Google "Progressive Web Apps ("PWAs") are experiences that combine the best of the web and the best of apps. They are useful to users from the very first visit in a browser tab, no install required. As the user progressively builds a relationship with the app over time, it becomes more and more powerful. It loads quickly, even on flaky networks, sends relevant push notifications, has an icon on the home screen, and loads as a top-level, full screen experience."

Progressive Web Apps - The Smart Choice

| Platform Features & Capabilities | Progressive Web Apps | Responsive Websites | Mobile Apps |
|---------------------------------------------|----------------------|---------------------|-------------|
| Progressive - works with every browser | ✓ | ✗ | ✗ |
| Responsive - fits any device | ✓ | ✓ | ✗ |
| App like - looks and acts like a mobile app | ✓ | ✗ | ✓ |
| Fresh - Always up-to-date | ✓ | ✓ | ✗ |
| Safe - forces HTTPS encryption | ✓ | ✗ | ✗ |
| Discoverable - search engines can find it | ✓ | ✓ | ✗ |
| Re-engageable - send push notifications | ✓ | ✗ | ✓ |
| Brandable - Add icon to user's home screen | ✓ | ✗ | ✓ |
| Linkable - share applications via URL | ✓ | ✓ | ✗ |
| Independent of Apple App Store | ✓ | ✓ | ✗ |
| Independent of Google Play | ✓ | ✓ | ✗ |
| App download onto device is not required | ✓ | ✓ | ✗ |
| Installation on device is not required | ✓ | ✗ | ✗ |
| Works offline - Network not always required | ✓ | ✗ | ✗ |
| Cost effective development process | ✓ | ✓ | ✗ |
| Fast development time - quick to market | ✓ | ✓ | ✗ |
| Can be paired with a .app domain name | ✓ | ✗ | ✗ |

Popular brands such as [Google Maps](#) and [Google Photos](#), [Instagram](#), [Pinterest](#), [Starbucks](#), [Uber](#) and [Lyft](#), [Forbes](#) and [The Washington Post](#) are just some of the many companies that have embraced PWAs. Each of these PWA deployments have experienced dramatic, positive results.

To their credit, [Google](#), Microsoft and Apple are all pushing for [greater adoption of HTTPS encryption](#). Google is encouraging developers to [build and deploy progressive web apps](#) and to use its [Google Cloud Platform](#) ("GCP") and tools like [Lighthouse](#), [Firebase](#) and [App Maker](#).



<https://developers.google.com/web>

Myth: Small Businesses Don't Do Mobile Apps

Not true. Many companies have and use mobile applications. These businesses represent only a small fraction of all that could use and financially benefit from mobile app marketing.

.app top-level domains provide a superior solution for securing B2C communications. The TLD also adds browser speed and better user experience opportunities.

Progressive web apps provide a unique opportunity for companies to connect and engage with their customers and the public. They're also an often overlooked and underutilized mobile-marketing channel. Businesses that use mobile apps and/or progressive web apps as part of their mobile-first marketing strategy can enjoy a significant competitive advantage. When a well-built progressive web app is paired with an appropriate .app domain name, traditional websites and native mobile apps cannot effectively compete.

A well-built progressive web app-combined with a premium.app domain name, is a winning Web-marketing strategy.

RB Tewksbury

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5G Slicing: Concepts, Architectures and Challenges

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Part 2: Network Slicing Concepts and Requirements

In the previous blog in this series, I talked about the basic tenants of network slicing. We discussed what network slicing was, and started by defining some requirements. Mainly I discussed the role of resources and virtualization. In this blog, I will discuss a few more basic requirements for network slicing. Specifically, orchestration, isolation and autonomous behaviors.

Orchestration

In its general sense, orchestration can be defined as the art of both bringing together and coordinate disparate things into a coherent whole. In a slicing environment, where the resources involved are so diverse, an orchestrator is needed to coordinate seemingly disparate network processes for creating, managing and delivering services.

The industry has yet to define a unified vision and scope for orchestration, or orchestrators. However, in general, orchestration is defined as the continuing process of selecting resources to fulfill client service demands in an optimal manner. The idea of optimal refers to the optimization policy that governs 'orchestrator' behavior. In other words, to meet all the specific policies and SLAs of the specific services and with the fewest possible resources. The term continuing means that available resources, service demands and optimization criteria may change overtime.

However with network slicing orchestration cannot be performed by a single centralized entity, not only because of the complexity and broad scope or orchestration tasks, but also because it is necessary to preserve management independence and support the possibility of recursion.

In my point of view, the network needs a framework where each virtualized function has an entity performing the orchestration. The orchestrating entities should exchange information (at the API layer) and delegate/change/add functionalities between them to ensure that the services delivered satisfies the required performance levels with optimal resource and its LCM.

Isolation

To operate simultaneous slices on a common shared underlying infrastructure, strong isolation is a must. One must look at isolation in terms of:

- **Performance:** each slice is defined to meet particular service requirements, usually expressed in the form of KPIs. Performance isolation is an E2E issue and has to ensure that service-specific performance requirements are always met by each slice, regardless of congestion or performance of other slices.
- **Security and privacy:** attacks, failures or faults occurring on one slice cannot impact on other slices. Moreover, each slice must have independent security functions and definitions to prevent unauthorized entities from access to slice-specific configuration/management/accounting information. With the ability to record these attempts, whether authorized or not.
- **Management:** each slice must be independently managed as a separate network that starts from the base station all the way to the core.

To achieve isolation, a set of appropriate, consistent policies and mechanisms have to be defined at each virtualization level. The policies need to include a list of rules that describe how different manageable entities must be properly isolated. The mechanisms (how it is to be done) are the processes that are implemented to enforce the defined policies. To fully realize isolation level, one must employ both virtualization and orchestration.

Autonomous Behaviors

Once a slice is set up, no matter if it's used, that specific slice that was set up should function autonomously with no human intervention. The reason that autonomous functionality is required is due to the fact the network cannot be expected to know or understand what going on in next slice, or how the demand will change over time.

Autonomous behavior will require several components:

- **Scheduling Algorithm** - to schedule and analyze resources required to support all changes. The algorithm needs to send the information collected to the orchestrator.
- **Resource Management** – which is needed to receive an accurate, real-time status of resource utilization, schedule resources for upcoming tasks and alert when utilization has been maxed out. The orchestrator will then decide upon next steps.
- **Machine Learning** – As opposed to 4G/LTE, 5G networks should be able to handle extreme situations in an ambiguous, changing environment. Reducing the number of changes in the LCM without using KPIs or thresholds, is a major challenge. ML should not only help to provide “forecast” of demand, but also help prepare the network by increasing/decreasing network resources within the domains or zones.

Netflix is a great example of such autonomous service. Stay tuned for part 3.

CALENDAR OF EVENTS

**Girls' in ICT - Trinidad
"Tech Savvy Girls"**

24 -25th
April, 2019

6-10TH
May, 2019

C7 Initiative, Dominica

**CANTO 13th WTISD
Regional Video Competition**

17th
May, 2019

21st -24th
July, 2019

**CANTO 35th Annual Conference
& Trade Exhibition
Hyatt Regency Hotel, Trinidad**

CWC Ministerial Roundtable

22nd
July, 2019

23rd
July, 2019

Digicel Ministerial Breakfast



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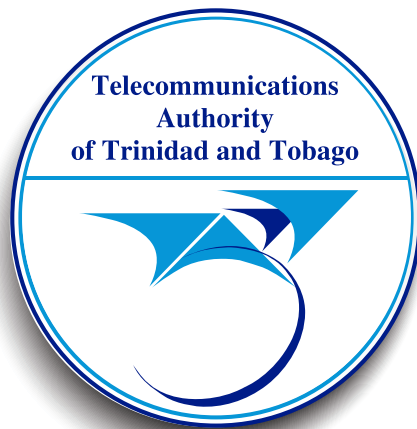


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