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Contents

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.

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ENGAGE LEAD ADVOCATE

Editorial (English)

CANTO's signature word for this quarter is "Gratitude". We at CANTO have so many blessings for which we are grateful, both individually and collectively as an organization.

Our 34th Annual Conference and Trade Exhibition, which was held at Hard Rock Hotel in Panama from July 22nd to July 26th, can now be deemed a success. This is due to the hard work by our dedicated teams. We graciously acknowledge the magnanimous effort which would have been required by our stakeholders in order to enable the successful outcome. Thank You!

We took the opportunity to launch "CANTO Innovation Awards", recognizing the work and contributions of our members who are contributing tremendously to the growth and development of the ICT industry as well as affecting their social space in a positive way.

Member satisfaction is one of our main goals at CANTO, thus we diligently listen to what you are saying. As our Secretary General, Mrs. Teresa Wankin indicated in her welcome address; many of the items on this year's conference agenda was in response to what you were saying. One such item was the workshop on "Leveraging Mobile to Achieve (SDGs) Sustainable Development Goals.

In his welcome address Chairman Julian Wilkins gave attention to data protection and the need for Operators to operate within a moral framework despite the current world environment which exist within the technological arena.

Euan Fannel, Vice President of Corporate of C&W at the opening ceremony, stressed the important role CANTO's annual events play in the advancement of the digital economy and the development of countries in the Caribbean and the greater Americas.

FCC Chairman Ajit Pai during his speech at the closing of the first day's events reiterated that the primary focus of his chairmanship is to close the digital divide in order to ensure that everyone can benefit from the Internet revolution, because access to the Internet translates into access to a better life. He even cited a recent Mc Kinsey analysis which detailed how broadband-enabled "Smart City" applications could result in job creation, crime reduction, a clean environment and lower health care costs with improved outcomes and thus an increase in the number of lives saved. He added that one of the key lessons he has learned in his many travels, since becoming FCC Chairman is no matter what you do for a living or where you do it , Broadband is critical." Thus he made a clarion call for everyone to begin to work together in order to bring digital opportunity to all the people we are honoured to serve.

Disaster is foremost on the agenda of CANTO. On August 21st, Trinidad & Tobago, headquarters of CANTO, experienced a 6.7 magnitude earthquake. Though the damage was minimal, we shudder at the thought of the mountainous number of accompanying problems which would have resulted for the telecommunications industry and the country as a whole.

We are also in the midst of the 2018 hurricane season with not so pleasant memories of the 2017 season still etched in our minds. However, out of the negative emerged a positive in the form of the SONAR platform, an initiative developed by the youths of our CANTO Community. This Emergency Management System focuses on all aspects of an emergency, namely:- before, during and after components.

We could never be 100 percent ready for any disaster; but in 2018 we are better prepared than we have ever been. During her welcome address at our 34th Conference and Trade Exhibition, our Secretary General Mrs. Teresa Wankin invited attendees to sign up to test "this remarkable product" which was at that time being tested in St. Maarten and Haiti; she also urged more countries to participate in the testing stage.

The Disaster Risk Management Committee urges members to fill out the Disaster Status Report form and forward it to CANTO to be able to provide assistance in the unfortunate event of a disaster.

Our upcoming 35th AGM & Mini Expo will be held in Guyana, hosted by the GT&T. The event will focus on the theme *'Transitioning to a Digital Region – Opportunities and Challenges'* with a workshop. The Mini Expo will showcase emerging technologies from global suppliers while the GSMA led workshop will focus on 'Unlocking Rural Mobile Coverage'. We are looking forward to it with great anticipation and you will be kept abreast of the details in the near future.

We are grateful to all our stakeholders for 2018 and extend a heartfelt "Thank You" to all who have been on the journey with us thus far, as we hold steadfast to our Vision, so our long-term Mission may be a shared success.

La palabra distintiva de CANTO para este trimestre es "Gratitud". Nosotros en CANTO tenemos muchas bendiciones por las cuales estamos agradecidos, tanto individual así también como organización colectivamente.

Nuestra 34ª Conferencia y Exposición Comercial Anual, que se celebró en el Hotel Hard Rock en Panamá del 22 al 26 de julio, ahora puede considerarse un éxito. Esto se debe al trabajo duro de nuestros dedicados equipos. Cordialmente reconocemos el esfuerzo magnánimo que habrían requerido nuestros patrocinadores para lograr este resultado. ¡Gracias!

Aprovechamos la oportunidad para lanzar "CANTO Innovation Awards", reconociendo el trabajo y las contribuciones de nuestros miembros que contribuyen tremendamente al crecimiento y desarrollo de la industria de las TIC, así como a su espacio social de una manera positiva.

La satisfacción de los miembros es uno de nuestros principales objetivos en CANTO, por lo que escuchamos diligentemente lo que usted nos dice. Como lo indicó nuestra Secretaria General, la Sra. Teresa Wankin en su discurso de bienvenida; muchos de los puntos en la agenda de la conferencia de este año fueron desarrollados en respuesta a lo que ustedes nos plantearon. Uno de esos ítems fue el taller sobre los Objetivos de Desarrollo Sostenible "Aprovechar los Objetivos Móviles para Lograr (ODS)".

En su discurso de bienvenida, el presidente Julian Wilkin prestó atención a la protección de datos y la necesidad de que los operadores operen dentro de un marco moral a pesar del entorno mundial actual que existe dentro del ámbito tecnológico.

Euan Fannel, Vicepresidente Corporativo de C & W en la ceremonia de inauguración, destacó el papel importante que el evento anual de CANTO desempeña en el avance de la economía digital y el desarrollo de los países del Caribe y el Continente Americano. El presidente de la FCC, Ajit Pai, durante su discurso en el cierre de los eventos del primer día reiteró que el objetivo principal de su presidencia sigue siendo cerrar la brecha digital para garantizar que todos puedan beneficiarse de la Revolución de Internet, porque el acceso a Internet se traduce en acceso a una vida mejor Incluso citó un análisis reciente de Mc Kinsey que detallaba cómo las aplicaciones de Smart City habilitadas para banda ancha podrían generar creación de empleo, reducción de delitos, un entorno limpio y menores costos de atención médica con mejores resultados y, por lo tanto, un aumento en la cantidad de vidas salvadas. Agregó que una de las lecciones clave que aprendió en sus muchos viajes, desde que se convirtió en presidente de la FCC es no importa lo que hagas para ganarte la vida o donde lo hagas, Broadband es crítico. "Por lo tanto, hizo un llamado de atención para que todos comenzaran a trabajar juntos a fin de brindar oportunidades digitales a todas las personas a quienes tenemos el honor de servir.

El desastre es lo más importante en la agenda de CANTO. El 21 de agosto, Trinidad y Tobago, sede de CANTO, se salvó de un terremoto de 6,7 grados de magnitud. Nos estremecemos al pensar en la montañosa de problemas que lo acompañarían y que habría resultado para la industria de las telecomunicaciones y para el país en general.

También estamos en medio de la temporada de huracanes con recuerdos no tan agradables de la temporada de huracanes de 2017. Sin embargo, de lo negativo surgió un aspecto positivo en la forma de la plataforma SONAR. Una iniciativa CANTO desarrollada en el Caribe para el Caribe por jóvenes de nuestra Comunidad CANTO. Este Sistema de gestión de emergencias se centra en todos los aspectos de una emergencia, a saber:- antes, durante y después de los componentes. Aunque nunca podríamos estar

100% preparados para un desastre; al menos en 2018 estamos mejor preparados que nunca. Durante su discurso de bienvenida en nuestra 34ª Conferencia y Exhibición Comercial, nuestra Secretaria General, Sra. Teresa Wankin, invitó a los asistentes a visitar el stand de PieData y registrarse para probar "este notable producto" que en ese momento se estaba probando en St. Maarten y Haití; también instó a más países a participar en la etapa de prueba.

El Comité de Administración de Riesgo de Desastres insta a los miembros a completar el formulario del Informe de estado de desastre y enviarlo a CANTO para que pueda brindar asistencia en el desafortunado caso de un desastre.

Nuestra próxima 35ª AGM & Mini Expo se realizará en Guyana, organizada por GTT. El evento se centrará en el tema 'Transición a una región digital: oportunidades y desafíos con un taller. La Mini Expo mostrará las tecnologías emergentes de proveedores globales, mientras que el taller dirigido por GSMA se enfocará en 'Desbloquear la cobertura móvil rural'. Esperamos con gran anticipación y usted estará al tanto de los detalles en el futuro cercano.

Esta última parte de 2018 ha sido muy memorable, aunque hemos tenido éxito para nosotros en CANTO y les ofrecemos un sincero "Gracias" a todos los que han estado en el camino con nosotros hasta el momento, ya que nos mantenemos firmes en nuestra Visión, por lo que nuestra larga El término Misión puede ser un éxito compartido.

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Ajit Pai Urges Delegates to Work Together to Bring Digital Opportunity to all

Congratulations on this 34th annual CANTO meeting. I wasn't around for the first one in 1985 I suppose I was too busy enjoying Billy Ocean's "Caribbean Queen," which was a big hit the prior year. So this is my first time attending the annual meeting. My initial impression is that every international conference should have a theme song. I love it!

Let me add that I'm honored to be speaking in the closer's role for this session. But it is a little intimidating not just because I have to follow so many impressive speakers, but because we are in Panama, home of the greatest closer in baseball history: Mariano Rivera of the New York Yankees, or El Cerrador.

Thinking of what to say today, I looked to this Panamanian baseball legend for inspiration. One of the most remarkable things about Mariano Rivera was that he was able to dominate hitters with only one type of pitch. At the end of his career, he threw his "cutter" roughly 90% of the time. Even though hitters knew what was coming, the pitch still worked.

Embracing this model of finding what works and sticking with it, the primary focus of my remarks will be the primary focus of my chairmanship since day one: closing the digital divide in order to make sure everyone can benefit from the Internet revolution.

I've made it my top goal to deliver digital opportunity to everyone in my country for the same reason that so many of you have done so in your countries: because access to the Internet means access to a better life. Like you, I've seen the expert reports that try to quantify the economic and social opportunities created by wired and wireless connectivity. A recent McKinsey analysis detailed how broadband-enabled "smart city" applications could create jobs, reduce crime, clean the environment, and lower healthcare costs while improving outcomes, literally saving lives. These analyses are valuable, but what compels me most—what inspires me—are the people I've met who are trying to make their way in the digital age. You may think that a country as large and resource-rich as the United States can't possibly understand the connectivity challenges of countries in the Caribbean region. But what I've seen in traveling around my country, including to Puerto Rico and the U.S. Virgin Islands in the Caribbean, and hearing from regulators from all over the world is that we do share common challenges. And if we share common challenges, we can certainly share common strategies for addressing those challenges and increasing opportunities for all our citizens.

Since becoming Chairman, I've made it a point to get out of Washington, D.C., whenever possible. I've seen first-hand the ways that digital technologies are transforming communities. And I've also seen how inadequate Internet access is creating problems for the people and places being bypassed by the broadband revolution.

To date, I've visited roughly 90 cities in 33 states in the U.S., driving more than 8,500 road miles in some hard-working rental cars. To put 8,500 miles into perspective, that's more than the distance from Washington, D.C. to Ushuaia, the southernmost town in South America—and back to Buenos Aires. Or to put it in a different perspective, that's 166 trips through the Panama Canal. These road trips allow me to see remote places like Wisdom, Montana, population 98, that are challenging to reach with broadband.

What are some of the key lessons from this travel?

One is that no matter what you do for a living or where you do it, broadband is critical.

You wouldn't necessarily think of a potato farm in Idaho as a technology company. But I recently visited one that uses everything from an LTE-based soil analysis app to drones to improve productivity and reduce costs. On this same trip, I met a hop-producer that uses sensors that monitor the soil and advanced machinery that improves efficiency.

Even some of the oldest industries use the newest technologies. I recently visited a mine that relies on fiber and Wi-Fi to keep in touch with miners two miles below ground. That same company is using virtual reality to explore and evaluate uses for potential new, 150-ton equipment.

A second key lesson is that the communities that are the hardest to connect are also the places that have the most to gain from next-generation networks.

A few months ago, I was in Scottsville, Kentucky, a town of about 4,000 people. There was a hospital in the county, but no pediatrician. But now, thanks to a high-speed connection between the local school and Vanderbilt University's Children's Hospital 65 miles away, all a sick student has to do to see a top-notch pediatrician is walk to the school nurse's office.

And in Wardensville, West Virginia, I saw how broadband enabled a transcription-service company that requires massive video downloads to set up shop in this town of about 300 people and hire 28 full-time employees.

Access to broadband in small, rural communities means access to jobs, healthcare, and other opportunities that were previously unimaginable.

The third takeaway is that the costs of being on the wrong side of the digital divide are high and getting higher.

On a recent trip through Eastern Oregon, I heard from local officials about how the lack of highspeed broadband access is hurting the economy and is even making some residents less optimistic about the future. And a vivid illustration of the costs of being disconnected came on a visit to an Indian reservation in South Dakota. I heard the story of a woman who was found dead in her home, clutching her cellphone. She had dialed 911, the emergency number, 38 times—but never got a response. There simply wasn't wireless coverage.

I could stand up here and talk for a long time about what we are doing at the FCC to expand digital opportunity to more people. In fact, I will do just that (for a short time) during a separate session tomorrow.

But I share these stories today because as we kick off CANTO 2018, it's important that we never forget why we are here—why our work to expand digital opportunity matters. And that's because connectivity isn't just raising our standard of living, it's changing our way of life. High-speed broadband not only has the power to transform lives; it has the power to save lives.

That brings me to the final subject I wanted to highlight: disaster response.

This past year brought some of the most devastating hurricanes in recorded history to my country. In the wake of each storm, I visited the impacted areas. As bad as things were in Texas after the flooding from Hurricane Harvey and Florida after Hurricane Irma, the devastation I saw in Puerto Rico and the U.S. Virgin Islands was even worse.

Many of your countries were also hit hard. That's why disaster response strikes me as an obvious area where we should be working together. We should learn from our experiences and develop best practices so that we're all better prepared and more effective in responding to future disasters.

We should all be looking at what worked in the past and where we can improve service availability and restoration. And we need to engage stakeholders, including the private sector and the public safety community.

I came away from my visits to the islands in awe of the work that is done by first responders. Emergency response is a life-and-death job. The highest stakes demand the highest standards. That's true of our first responders, who consistently amaze and inspire me. We owe it to them to make sure our emergency communications systems meet those same high standards.

Let me close with this. I may represent the largest country at CANTO by size. But I come from a rather small town. I grew up in a place called Parsons, Kansas, population 9,900. My upbringing gives me a unique appreciation for the importance of connecting communities that are in danger of being left behind in the digital age. Growing up in a small town also gives me a keen appreciation of community—an appreciation of what it means to be a good neighbor. We may come from different countries, but we all share common bonds—bonds of geography and, more importantly, bonds of shared values. As your neighbor, I'm calling on all of us to work together to bring digital opportunity to all the people we are honored to serve.

Let's get to work.

DATA Made Simple: Machine Learning Will Improve Caribbean Education

Theon O' Connor and Jayme Hoyte

When it comes to taking your business to the next level and making your data work to your advantage, companies are moving with the times and the trends in technology. In the interest of making faster and more accurate decisions, companies invest thousands of dollars in smart machines and applications with machine learning capabilities. Machine Learning in recent times has become one of these super advanced technological trends that is set to provide solutions to some of the world's most pressing issues.

According to SAS, "Machine Learning is a method of data analysis that automates analytical model building. It is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention". Ideally, it is teaching computers to do what comes naturally to humans and animals: the art of learning from experiences.

"With more than 75 per cent of businesses investing in Big Data, the role of Artificial Intelligence and Machine Learning is set to increase dramatically over the next five years", (Feldman 2018). Some well-name companies like IBM, Facebook, Salesforce, and Google are all utilizing the power of Machine Learning to solve problems in Health, Natural language processing, Energy production, Customer relations and other areas of interest.

The Caribbean is slowly keeping pace with the developments in Machine Learning and it is becoming increasingly important, even more so in education where large amounts of data can be converted into usable information for the user. Machine Learning is important as it takes the understanding of data into a whole new universe, and what can be done with the data to improve outcomes is still being understood and appreciated.

In the education sector, SmartTerm is using machine learning to improve both academic and administrative processes.

1. Tracking student knowledge and recommending next steps. SmartTerm's platform is continuously assessing students' progress and adjusting as students become better, thus, advancing learning.
2. Grading student responses to assessments automatically. These systems are created to understand the grading rubric which assists in automatically grading students' work. It removes teacher bias and allows for an even playing field when being graded.
3. Mapping patterns of teachers who have better-performing students. In order to replicate the teachers' habits and behaviours that seem to increase students' performances, the system forms patterns and maps them. This information will then be used across institutions, thus improving learning and retention of students and teachers.
4. Accessing student information in one place. No longer do teachers access students' information in different locations. For example, teachers access students' grades through their grade book, but all other information is located

elsewhere. With Machine Learning, teachers are supported and they have access to all students' information in one place.

5. Machine Learning helps to reduce the time-consuming process of scheduling. Teachers can be scheduled with their classes and courses with very little hassle.

Although there are many benefits of Machine Learning to the education sector, two of the most important benefits are understanding students' performance and providing customized learning. Teachers are able to understand and predict student performance through the identification of strengths and weaknesses. The technology can also suggest ways to improve. This is important because the technology will be able to show teachers, in real time, the specific areas of an assessment where students are performing well and where they perform poorly. The teacher is then able to find ways to help the student improve his/her performance.

After understanding the strengths and weaknesses of each student, teachers can provide customized learning, which is suggested and supported by Machine Learning.

Overall, Machine Learning is improving education around the world. Unfortunately, Caribbean education has been lagging behind. It is now time for the Caribbean to embrace Machine Learning to be able to make both academic and administrative processes more efficient. Gone are the days when education was a one size fits all system, now we need to do right by our students.

Who We Are
SmartTerm is an Education Management Platform with the mission of digitizing education in the Caribbean. Our aim is to provide tech solutions for school's administration, teachers, students, parents and governments. With our built-in Machine Learning system, this will help schools to operate efficiently and provide governments with greater insight to their country's education system.

Connect with Us!
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How to be Successful - Top Tips From CANTO Women

Janice Sutherland
Sutherland Coaching and Consulting
Leadership Expert | Executive Coach | Keynote Speaker

I had the privilege of facilitating the Women in ICT Forum for CANTO 2018. As women remain underrepresented in fields of STEM, I was delighted to explore the strategies these women had adopted to begin closing the gender gap and inspiring the next generation of female innovators and leaders. This at a time when technology continues to rapidly transform the way we live, we can and should work to empower more women to take an active role in that transformation. So for employers who want to recruit more women in STEM and for women who want to step into the field or advance their careers, here are the key takeaways.

Rising Above Your Detractors

Not only do successful, ambitious women face resistance from men but the mean girl clique is still alive and kicking. Women face criticism regarding how they lead or even their success despite the fact they've earned it. General consensus was don't rise to the criticism, nor get bitter - whatever it is, let it go.

Demonstrate the reason why you are the leader by showing your wisdom and decision-making competence, remaining calm and collected. Most critics are trying to get a rise out of you, which may make you want to fire back. Don't! Self-defense is a natural instinct, but always weigh the costs.

Mentorship Pays

The value of mentorship figured highly with emphasis on not only finding a mentor but most importantly utilizing a mentor as a very powerful way to aid your development. If you can't find your ideal mentor then create a composite mentor - this is where you take 3-4 persons with different qualities to provide the support you need. For the mentee, it's a great way to share life experiences and learn from a mentor's challenges and achievements. For the mentor it's an opportunity to expand professional networks and make a difference to the career development of another person. There is even a win-win for organizations as they create a culture of continuous learning and knowledge transfer as well as a diverse workforce that stimulates, innovates and cultivates creativity.

Mitigating Bias

Being the only woman in the room can also bring challenges, even more so when the bias is so ingrained that it happens unconsciously. Examples were given of "Likeness bias", where people hire only those people that are like them and anecdotes were shared of working as young females in male dominated environs; difficulty in securing work without golfing, sailing, hockey experience, being the only woman in a board room, not being expected to return to work after maternity leave. This was a subject that could have been covered as a standalone with solutions given such utilizing technology to mitigate recruitment biases, using humor to deflect bias or stereotypes of women in the workplace.

Women Uplifting Women

The importance of women uplifting and supporting each other - recognizing those female leaders who blazed trails and those who are upcoming. Successful women, don't look back enough. But it's critical if the ratio of men to women at the top is to change. It can be challenging for a rising female star to envision herself in positions of power if she doesn't have a role model. Even more challenging was that sometimes successful women, don't feel compelled to help others since they fought hard on their own to get there. To change the status quo women leaders need to look back and see how they can encourage other women to succeed. There's a need not just to mentor but to also sponsor, that is proactively advocate for a high performing woman when the opportunity arises.

Embrace Your Support System

A strong support system is key to the well-being of a leader. Embarking on the leadership path, can be overwhelming and isolating. For women in STEM fields this is often new territory and the road ahead is not easy but it can be far easier if there is a strong support network in place. It can take the form of a supportive partner at home who understands that in order for a female leader to be successful, the "traditional" work-life relationship needs to be adapted to suit work-life reality.

Establishing a network with other women, who are either or have been through similar experiences, being able to talk to them and discuss issues can make a huge difference.

Celebrate Your Successes

Learning how to celebrate successes when feelings of self-doubt arise is key. The goal is to identify something that has been accomplished, conduct your own personal review. It's easy to focus on what's not working and forget to recognize what's gone well and if there's something you can take from it to inspire or replicate in other actions and goals. Focusing on accomplishments no matter how small the win, helps to cultivate a success mindset.

Let Your Voice Be Heard

Culturally women have been conditioned to be sympathetic and empathic to the needs of others well before their own, so much so that we become adept at using deferential language such as "I'm sorry to say", "Apologies for asking", "With all due respect" or "I'm just..." Don't be afraid to let your voice be heard, it's time to believe in your words when you communicate them to other people. You don't want to disregard your thoughts just because you don't think they're good enough or afraid that someone else won't like them.

Women in STEM have one of the hardest and what can be the most rewarding jobs in the world. However, the burden of improving gender diversity in STEM shouldn't solely be placed on women's shoulders, but systemic change can be slow and organizations need to actively play their part. For women who want to become successful in STEM, even if they find themselves in tough company cultures, embracing and embodying the success factors highlighted can help.

Community Networks Could Help Strengthen the Caribbean Internet

Gerard Best

By some estimates, only half of the world's population has Internet Access, leaving the other half at a sizeable competitive disadvantage.

This profound connectivity gap is especially significant in the unserved and underserved areas of developing and least-developed countries. For people who live in these places, Internet connectivity is not just about the Internet. It is a lifeline that gives access to electronic commerce and telehealth services, distance learning, social and political engagement, government services and public safety information, and much more. Without it, entire communities risk being left behind.

Community networks offer a solution. These are computer-based networks deployed and operated by a local group to meet their own communication needs. Community networks can emerge organically as the result of people working together, combining their resources, organising their efforts, and connecting themselves to close connectivity. Or they can be deployed quite quickly in times of crisis, such as in the response to an earthquake or hurricane.

Community networks complement traditional service providers by providing local access where mainstream networks do not generally operate. Several hundred community networks exist worldwide, some built and managed by individuals, others by organisations from the private or public sector. Whatever shape they take, community networks are basically do-it-yourself networks built by people for people. Unlike the top-down approach of commercial service providers, community networks are typically from-the-ground-up projects that enable local development and help keep profits local — generally providing training for the users and reinvesting any proceeds back into in the local community.

These and other potential benefits of community networks for the Caribbean were highlighted during a panel discussion at a regional telecommunications industry conference hosted recently by telecom service provider association CANTO.

"Governments, policy makers and the private sector are exploring strategies and partnerships to connect the unconnected," said panelist Jane Coffin, Director of Development Strategy at the Internet Society. Coffin issued a call for all Caribbean stakeholders to look at innovative and smart ways to bring Internet access to the region's underserved and unconnected communities.

Another panelist was Adriana Lambardini, a former commissioner of the telecommunications regulator in Mexico, who gave insights on practical ways that governments can create an enabling environment for community networks.

"We need to make sure that the fiscal incentives are put in place," she said, explaining that governments should consider creating polices to specifically address not-for-profit and small-scale operators, in order to address market dominance by larger, commercial providers.

Nicolás Pace of Altermundi, shared tales from the trenches of deploying community networks in Central America and the Caribbean. Community networks have also been deployed across the world, from some of the poorest peoples of Nepal, India, Kenya and Mexico, to the unconnected communities of New York and San Francisco in the United States, to the underserved communities of Georgia in Eastern Europe.

The panel was moderated by Shernon Osepa, Regional Affairs Manager for Latin America and the Caribbean at the Internet Society.

The CANTO conference, which was held in Panama City from July 22 to 26, attracted a wide range of stakeholders from across the region's Internet and telecommunications industry, including regulators, government ministers, policy makers, Internet organisations, network operators, suppliers and vendors.

CANTO Prepares Stakeholders in Transitioning to a Digital Region

Georgetown, September 17th, 2018

CANTO together with one of the founding members - Guyana Telephone & Telegraph Company (GTT) will cohost the 35th Annual General Meeting & Mini Expo at the Guyana Marriott Hotel Georgetown. The event carded for the 27th - 30th January, 2019, will welcome over 250 C-level CANTO members and stakeholders in the ICT sector from 30 countries.

The conference segment of the event will be guided by the theme 'Transitioning to a Digital Region – Opportunities and Challenges', and its emergence as a key driver of sweeping change in the world around us. The telecommunications industry is at the forefront of this transformation, both as an industry witnessing large-scale change in its market environment and as a key driver of worldwide digitalization.

Deliberations along the captioned theme will contribute to improving the state of our region and by extension the world through the harnessing of the value added from digital transformation, both for business and society, while identifying the challenges to be overcome in order to deliver premium customer value in an equalized digitally transformed ecosystem. A pivotal aspect of this event is the Annual General Meeting which will allow members to focus on the statutory obligations and chart the course of the Association for the 2019/20 financial year.

The Mini Expo will showcase emerging technologies from global suppliers while the GSMA led workshop will center on 'Unlocking Rural Mobile Coverage'. 35 years is a major milestone for CANTO and what better way to celebrate this prestigious event with GTT at the helm in an emerging country such as Guyana. With the recent development in the oil and gas sector, Guyana's economy is expected to burgeon in the future. The transition to a digital economy is inevitable and GTT and CANTO will be part of that transformational change.

For more information on the 35th AGM visit – www.canto.org/agm

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- Emerging technologies – Mini Expo
- GSMA workshop on 'Unlocking Rural Mobile Coverage'.
- C- Level experts and delegates
- CANTO Annual Proceedings.

27-30TH JANUARY, 2019
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MC - Wendell Etienne

Opening Prayer - Gervon Abraham, TSTT

Welcome Remarks - Teresa Wankin,
Secretary General, CANTO

Chairman's Address - J. Wilkins
Chairman, CANTO

Remarks from Headline Sponsor -
Euan Fannell, VP Corporate Affairs, CWC

Feature Address - Ajit Pai, FCC Chairman

Vote of Thanks - Charles Carter,
CANTO Director

Delegates at Opening Ceremony

Cultural dance by Ballet Folklorico
de Panama

Cross Section of Audience at Opening Ceremony

Ribbon Cutting Ceremony at Opening of Exhibition

Go for the Latest Technologies – But Ensure it's Safe and Lawful

The Telecommunications Authority of Trinidad and Tobago

Innovativeness in any market inevitably leads to increased profits for manufacturers and providers, while satisfying consumers' insatiable appetite for the latest goods and services.

This pattern has since 1980 characterised the global Information and Communications Technology (ICT) market, which continues to undergo an unprecedented rapid evolutionary process. Faster smarter computers and mobile devices powered by the Internet, fleetingly satisfy the demands of corporate and private consumers.

The pace of this evolutionary process has been mind-boggling. For example, in 1980, shortly after mobile telephones were introduced, World Bank statistics show there were a mere 23,482 in the world. Twenty years later in 2000, there were 7.3 million. We need to compare these figures with mobile phone subscriber growth figures between 2000 and 2017 to see the quantum leap in the uptake of this technology. According to the International Telecommunications Union (ITU), in the seventeen years between 2000 and 2017, the number of mobile telephones surpassed the global population – the figure was a whopping 7.7 billion. These figures provided reflect growing consumer appetite for ICT devices and services particularly over the last decade.

In looking at those figures we ought to keep in mind the fact that mobile phones in the last decade have become multifaceted devices, allowing consumers to make voice calls, send text messages, stream video content, surf the Internet, participate in online meetings, connect with other devices and appliances, track some vital body signs and the list continues to grow as fast as apps are developed.

The "technology" explosion is the new normal, reaching far-flung corners of the earth, including remote villages, in underdeveloped nations. Amid this, consumers' appetites for these growing technologies are almost insatiable. People from all points of the social spectrum, the millennials and the millennials at heart, just about everyone is seeking the latest and demanding more out of every device and service.

One service, home entertainment on demand, particularly among families, is fast gaining in popularity. Subscription television had been satisfying that need, however prevailing global and personal economic challenges have had consumers adhering to tighter budgets.

The solution to this dilemma for some is the Android TV box which was introduced to the world four years ago. An Android TV box is a set-top box running on an Android operating system. In the United States of America, the box is known as a streaming media device and in Europe, a Kodi box. These boxes enable their users to stream content from the Internet for viewing on televisions or monitors.

Its main attraction is cost. Unlike subscription television, which requires subscribers to pay a monthly fee for content, Android boxes are sold at a "one-off" price. There are no recurring costs or fees and often the device is advertised as a replacement for cable television. The device's attractiveness is also bolstered by pre-loaded apps which allow viewers to access a vast library of audiovisual content they may not otherwise have access to.

Attractive? Yes. But at what cost?

Android boxes on their own do not pose any significant risks nor do they carry any legal ramifications. However, configured Android boxes or any other streaming media device which are equipped with apps that facilitate unauthorised access to copyrighted material may carry legal implications. These boxes, which are sometimes advertised as "fully loaded", facilitate unlawful access to television shows, movies and sports programmes which consumers would otherwise have to pay for.

In the face of this information, some may wonder why this should be a matter of concern. It has to do with the breaking of copyright laws. Accessing content for which permission has not been granted is akin to stealing.

Similarly, a device which has been configured to circumvent copyright protection has been deemed as a breach of copyright laws in some countries, e.g. the UK.

In addition, viewers expose themselves to online risks when accessing content from unreliable sources through these or other devices. Experts warn of increased exposure to malware and other cybersecurity and privacy issues that are typically associated with "pirate" add-ons.

Considering this, subscribers in Trinidad & Tobago are being advised by the Telecommunications Authority of Trinidad and Tobago (TATT) the body responsible for managing matters pertaining to telecommunications and broadcasting in Trinidad and Tobago, to consider the true cost of their entertainment selections and ensure the programs they enjoy are accessed through safe and legitimate means.

The Future of 5G is on the Edge

Erez Zelikovitz
Vice President and Head of the SDN/NFV Network Solutions Business Line at ECI Telecom.

I t's been uttered time and again – 5G isn't just another G. It will usher in a new era of connectivity, acting as the catalyst for applications like AR/VR, V2I and V2V communications and the IoT.

The telecoms industry moves fast, and in the midst of updating legacy networks and evolving to SDN, operators are simultaneously planning their 5G deployments. The industry is rethinking network infrastructure as we know it, and a major component of this is building this out at the edge, removed from the network core where carriers have become accustomed to processing.

By upgrading the network with edge deployments, operators will see more flexibility and be in a better position to keep latency down while sup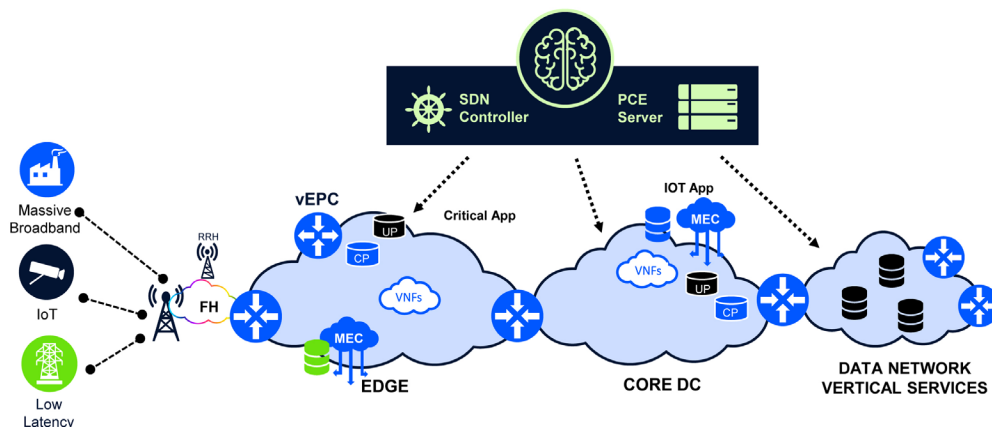plying the connectivity and bandwidth needed for key 5G applications. This is called Multi-access Edge Computing (MEC), and calls for service providers to structure their networks and include computing resources closer to the edge.

Moving Towards the (smart, multi-access) Edge

Why is MEC so integral to 5G infrastructure? It all comes down to efficiency, and edge computing provides the majority of compute and processing power right where the customer needs it.

The requirements for 5G will place great pressures on the network. In order to deliver the low-latency/high-bandwidth connectivity required to power autonomous vehicles and enable remote surgery, for example, operators shouldn't have data travelling all the way to the network core for analysis and decision making. Travelling across the network

5G ARCHITECTURE
DISTRIBUTED CORE, MESH CONNECTIVITY

itself increases latency and the response time to the delay sensitive applications, such as mission-critical applications and the ones mentioned above where anything but real-time is unacceptable.

The industry is already convinced by the power of MEC. Trials have shown just how crucial it is to enabling live, real-time video streaming and connectivity in crowded areas like stadiums, for example. When operators run their applications and data analytics services at the edge, they can hugely reduce the amount of data traffic running across the network. Operators also have the ability to dial up and down network functions to accommodate user demands. This is a win-win for customers, operators and application vendors since it cuts costs while still allowing for other applications to transfer data.
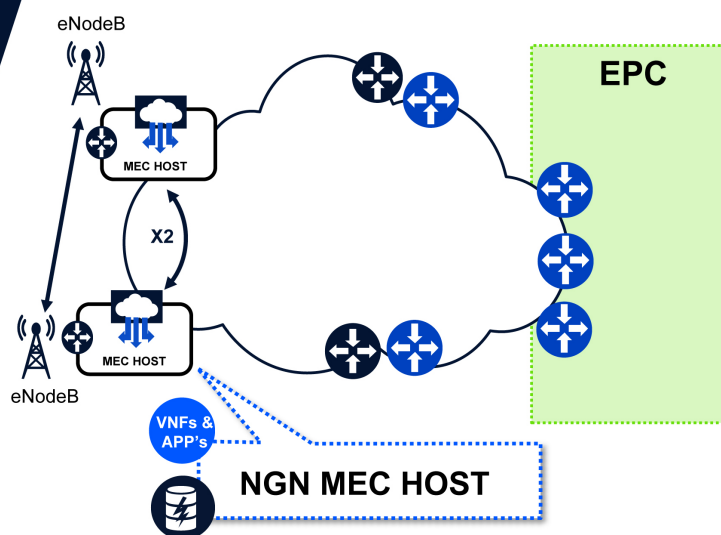
Ahead of 5G, the distributed nature of MEC nodes in 4G and LTE networks allows operators to support high volumes of connected devices and the data transfer that accompanies them, today. However, when 5G is rolled out, mobile operators will be able to quickly and effectively deploy new revenue generating services for content delivery, Internet-of-things (IoT) connectivity, retail and enterprise applications.

Network Slicing as a MEC-Enabler

In discussing 5G MEC, it's difficult not to mention network slicing. Virtualized fixed networks will frequently utilize network slicing to help deliver ROI from the data travelling across the network. With 5G networks, operators can use network slicing to partition one physical mobile network into multiple virtual networks, increasing network elasticity and delivering on unique SLA profiles. Allocating appropriate slices to applications and service flows running in MEC will more easily provide the appropriate latency or bandwidth capabilities for a particular use case – whether that's real-time video streaming or V2V communications.

5G READY MEC SOLUTION

- Control and user plane aware
- Underlay and overlay handling
- Traffic inspection and classification (GTP aware)
- Service chaining
- Traffic and data path offloading
- Programmable data-plane (SDN)

When it comes to enhanced mobile broadband (eMBB), slicing will be crucial in aggregating the best, most scalable aspects of the core, as well as the data processed at the edge, to ensure 5G services are not compromised by latency and poorly managed network traffic.

Balancing the Load Between Edge and Core
It's no secret that today's networks will need to undergo some drastic changes to accommodate 5G, whether that's future-proofing now or taking a wait and see approach. And while MEC will surely be a savior for many of the latency-sensitive applications served by 5G, it's not a 5G panacea. The network core remains important as many services, especially those with looser latency requirements, will still have data navigating across the network and to the core for processing.

In fact, MEC is most effective when utilized as a complementary methodology to existing solutions in the network core. When MEC is overused, it can become a costly alternative. Central intelligence and management is needed, not only to oversee operations and direct the network elements, but also to disperse the data traffic. At the same time, operators have to manage the "groundhog" effect where services often arise on one side of the network and then appear on the other side. Each of these instances highlights a need for dynamic and assured connectivity – at the core. To strike this balance and "connect the edges", some may consider a data-centric approach - using a dynamic virtual network layer over the current installed base. However, this method is unreliable since virtual overlays lack the assurance that is essential for premium 5G services.

Without increased activity at the edge to handle the amount of analysis, data and processing for high-bandwidth, low-latency applications, 5G quickly falls short of its promise. But we can't forget the unparalleled dynamicity of the network core. For 5G to reach its full potential, and applications like IoT, V2V/V2I communications and real-time video streaming to truly shine, operators must complement core networking with ultra-reliable, resource-friendly MEC solutions.

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Unique Training Model Provides the Success of Regional Business School

Established in 1991, the Barbados-based University of the West Indies- Sagicor Cave Hill School of Business and Management (SCHSBM) has stood the test of time. In a world that offers easier access to education and training, its blend of academic teaching, hands-on training and organisational interventions has ensured the continued success of the alumni from the Executive Master's in Business Administration and Executive Diploma in Management programmes, as well as with the shorter Strategic Business Services programmes which tackle immediate, applicable needs. Serving its home base and the Eastern Caribbean, the SCHSBM has extended its reach to other territories such as Guyana, the British Virgin Islands, Belize, the Bahamas and the Cayman Islands. The school takes pride in the expertise of its faculty, trainers and facilitators, who are equipped with the latest tools and techniques to position participants and their organisations for financially viable and sustainable growth.

In addition to its training programmes and conferences, the SCHSBM offers consultancy and research services to institutions who seek improvement in their operations but are unsure where to start or how to tackle the issues they face. Likewise, organisations who prefer to have department- wide training of their staff or members have also benefitted from SCHSBM interventions.

While the school facilitates their programmes across the region, their home at the University of the West Indies, Cave Hill Campus offers three fully equipped, spacious, wheel chair accessible training rooms and one board room suited for seminars, conferences or executive meetings. Events held in this space also benefit from a fully fitted kitchen and dining hall area, and a lounge for guests to enjoy between sessions.

So if you are serious about the improvement of skills, knowledge and abilities, or seek an event venue, contact the Sagicor Cave Hill School of Business and Management to begin the process of meeting your needs.

ARIN Elects First Board Member From the Caribbean

Gerard Best

Regenie Fräser

Port of Spain, Trinidad. August 9, 2018—Regenie Fräser, the former Secretary General of a regional trade association, has been selected to serve a one-year term on the board of trustees of the American Registry of Internet Numbers (ARIN).

Fraser's appointment makes her the first person from the Caribbean and the first non-white person to serve on the ARIN board.

ARIN is one of five registries worldwide that coordinate Internet number resources. The registry serves the United States, Canada and several territories in the Caribbean. ARIN's selection of Fräser is part of a larger move to increase the representation of the Caribbean region within its organisation.

"The appointment is part of the ARIN Trustees' ongoing commitment to board diversity and fulfills the April Call for Volunteers of Caribbean background," an August 9 announcement on the ARIN website said. Fräser, who is Surinamese, previously served for 11 years as secretary general of CANTO, a trade association of telecommunications organisations with an interest in the Caribbean. Her appointment will take effect from 1 January 2019, and in the interim she will sit on the board as an observer.

"ARIN congratulates Ms. Fräser on her appointment and looks forward to her participation within and contributions to ARIN Board of Trustees and the community," the announcement said.

The move has been some time in the making. Speaking at ARIN's public policy meeting in San Jose, California last October, President and CEO John Curran said, "We recognise that our policy development process can only benefit from the inclusion of more voices and perspectives from our constituents in the Caribbean."

But Bill Woodcock, a former ARIN board member who stepped down at the San Jose in order to create the opportunity for a more diverse leadership to emerge, framed the latest development as a significant success.

"After many years of trying, we've finally gotten the first ARIN board member from our Caribbean region!

Congratulations to Regenie Fraser and the ARIN board," Woodcock tweeted within minutes of the announcement being posted.

"It is great that this finally came together. It's been a long time coming, and it is satisfying to see that the efforts made have produced some meaningful results," he added in an interview.

Bevil Wooding, a leading Internet expert who is currently serving as ARIN Caribbean Liaison, said the appointment is in keeping with ARIN's increased efforts to be more inclusive and to encourage greater participation Caribbean-based stakeholders, at every level of its governance.

"Supporting the ARIN community in the Caribbean is a top priority for ARIN. The needs of the Caribbean are not necessarily the same as those of the US and Canada. In order to ensure that the Internet number resource policies reflect the whole ARIN Community, those policies must be developed in a way that includes voices and perspectives drawn from the Caribbean," Wooding said.

Teresa Wankin, who succeeded Fräser as Secretary General of CANTO in 2015, congratulated both Fräser and ARIN.

"I am both thrilled and excited about this appointment—thrilled that my friend and ex-boss is now on the board of trustees of ARIN, and excited that ARIN recognises the need for diversity and inclusion of a Caribbean representative on their board of trustees. It is also satisfying that the region now has a seat at the decision-making table for ARIN and I look forward to more international organisations including Caribbean representation at their highest levels," Wankin said.

Last year, two women from the Caribbean were appointed to the organisation's second-highest leadership body, the advisory council, for the first time. Advisory Council members voted to appoint Barbadian-born Alicia Trotman for a one-year term, starting January 1, 2018. Jamaican-born Kerrie Ann Richards was appointed as an interim member, also until December 31, 2018. Both applauded ARIN selection of Fräser.

"This is excellent news, another step in the right direction. ARIN should be commended on its continued commitment to diversity and excellence in leadership," Trotman said. Richards described Fräser as a "Caribbean flag bearer" on the ARIN board.

"As former Secretary General of CANTO, she has seen the growth of the Internet in the region and fully understands the unique circumstances facing island-states. The depth of knowledge she will bring will enrich the conversations at the ARIN board of trustees," Richards said.

"In the last twelve months, the number of Caribbean voices at the highest level of ARIN leadership has moved from zero to three. With the slate of nominees for ARIN's October elections being announced soon, I hope it will increase even further," she added.

The Era of 5G and the Impacts to the Telecommunications Industry

Scott Argue,
VP Client Services
SaskTel International

Wireless technology has made a significant step in functionality and performance, approximately every ten years. The first long-term evolution (LTE) commercial network launched in 2009 in Oslo, Norway. The fifth generation of mobile technology, 5G, will transition from concepts and trials to a commercial reality later in 2018 and early 2019, right on schedule.

Initial 5G deployments will utilize 5G New Radio (NR), but will still rely on the LTE core network for service. Second phase 5G deployments which utilize both 5G NR and a standardized 5G core network are expected in 2020. Mobile broadband is the key use case for LTE today, and initial 5G launches will be primarily focused on delivering and improving broadband for both mobile and fixed wireless subscribers.

While 5G is on the cusp of becoming reality, the peak in global LTE subscribers is not expected until 2030. LTE networks will continue to be enhanced and provide a high quality experience for the foreseeable future. 5G deployments will augment and complement current LTE deployments. Most near-term needs can be addressed with the evolution of LTE networks, but eventually 5G will replace LTE networks at some point after 2030.

The introduction of 5G networks is being driven by three general trends and service requirements that push beyond the capabilities of modern LTE networks.

Growth in Wireless Data Consumption

Mobile data consumption continues to grow at a torrid pace, particularly in North America, Meanwhile, ARPU (average revenue per user) growth continues to flatten. Many carriers have introduced gigabit LTE capabilities to deliver an enhanced customer experience and improve the overall efficiency of delivering data to wireless subscribers. More efficient delivery of data helps reduce the operator's cost to deliver a unit of data and improve their overall position. 5G is expected to further improve the efficiency of delivering data while also improving throughput speeds. Operators are also looking to 5G to provide a fixed broadband solution that can deliver fibre-like speeds.

Growth in Connected Devices

While current networks have been primarily designed for connecting people, future 5G networks will have a larger focus on connecting machines. There will be continued growth in personal connected devices, but there is larger growth predicted in connected machines, sensors in industry and public infrastructure. The initial 5G standards have not included Internet of Things (IoT), LTE-Advanced Pro introduced enhancements for IoT, LTE-M and Narrowband IoT (NB-IoT), which should address most cellular connected IoT use cases through 2020.

New Mission Critical Services

This exciting realm of services will take a longer incubation period to become mainstream. They will demand high reliability, strict requirements on transmission rates and will be heavily reliant on low latency. These services will be enabled by deep fibre networks and edge computing. They will pave the way for autonomous vehicles, factory automation or remote health-care services.

Many 5G use cases will require significant changes in the network that cannot be achieved through gradual evolution of LTE. Software-driven architectures, fluid networks that are extremely dense, higher frequency bands and wider spectrum bandwidths, millions of connected devices and multi-gigabit per second (Gbps) throughput will not be achieved through evolution of LTE, alone.

5G is an entire ecosystem that will be called upon to meet a diverse set of system requirements. The 5G system will encompass new designs utilizing new frequency bands, improved spectral efficiency and seamless integration of licensed and unlicensed bands. 5G will implement and rely on more software control and virtualization to provide the flexibility and scalability required to meet service demands.

The overall network structure will become "edgeless" and should appear to the subscriber to have "infinite capacity". Networks will embrace different slices for different services. Certain functions will be deployed closer to the customer edge and others will follow the traditional centralized deployment model. The flexibility of 5G to be tailored to the needs of a particular service will allow for greater network efficiency and agility in network operations.

Near-term 5G use cases will address broadband needs for both fixed and mobile networks. Fixed 5G will be leveraged to offer fibre-like broadband in areas where fibre deployments are either delayed or in areas where fibre to the premise is not economically feasible. Mobile 5G will further enhance the mobile broadband customer experience. Mobile 5G will serve as a complement to existing LTE networks in the short term, while serving as an eventual replacement of LTE in the long term.

Mid-term use cases will see more and more connected devices. Operators in North America are tending to start with LTE-M and follow with NB-IoT to address this growth before 5G. After 2020 5G IoT deployments will begin in the Americas region. China is expected to move to 5G IoT first, given their rapid adoption of IoT.

Long-term use cases will see the mainstream rollout of services that require high reliability and low latency. Many of these services will place additional bandwidth consumption requirements on the networks. These use cases will be enabled by strong fibre backbone networks along with increased use of edge computing.

As mentioned before, LTE is far from end of life. There are several enhancements in LTE to improve performance capacity and address the growing connections in the IoT space. An operator can continue to evolve their LTE network, but be forward thinking, so that LTE evolution provides building blocks for a future 5G network through network densification or choosing targeted deployments of advanced LTE features. 5G is an ecosystem that is flexible and can be tailored to the specific needs of current and future services.

SaskTel International (SI) will assist communication service providers in developing a strategic 5G transition plan that optimizes your investments and ongoing operations to support the current and future needs of your business. For more information visit our website: www.sasktelinternational.com or contact us at: info@sasktelinternational.com to speak to an account representative.

Wireless technology has made a significant step in functionality and performance, approximately every ten years. The fifth generation of mobile technology, 5G, will transition from concepts and trials to a commercial reality later in 2018 and early 2019.

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SI is unqiuely positioned to leverage the experience of our parent company SaskTel (a multi-play provider with over 110 years of experience), to aid in network design, implementation and operation of 5G technologies. For more information visit our website: **www.sasktelinternational.com** or contact us at: **info@sasktelinternational.com** to speak to an account representative.

Proud member of CANTO

Stretch Your High Potential Leaders: Six Ways to Grow Leaders From Within

Phyllis Reid-Jarvis, MPH, PCC, Certified MBTI Practitioner, President and Executive Coach at Ultimate Potentials Corporation

"…at the world's largest organization corporations…30% of new CEOs are hired from the outside…"

With more millennials in the workforce and many assuming leadership positions; it is imperative that senior leaders look for ways to develop this demographic while, preparing their predecessors for their inevitable ascent.

Millennials, also known as Generation Y, are born roughly between 1981-1996, give or take a few years. They are the second largest group to their parents-the Baby Boomers-many of whom are in leadership positions, with millennials reporting up to them-but not for long.

Here's the clincher; smart leaders know the current balance of power must shift if their organization is to survive into the next 30-90 years- that's only three generations! The shift that must happen, if started sooner than later, will see these organizations built to last.

How do leaders pave the way for leading their organizations to last long after they retire? It's simple-by developing their workforce with longevity, relevance and continuity in mind.

An article in Harvard Business Review (HBR) (November-December 2017) featured some very forward-thinking ways that organizations can go about to develop successful leaders. The approach is simple-yet tough for some leaders: making sure their promising employees reach their highest potential.

For this to happen, you must be a visionary and servant leader combined. Not an easy role- given demands to grow your top and bottom lines.

Below I expanded on 2 of 6 ways in which the article proposes growing leaders:

1. **Leading a Large Organization:** This stretch assignment develops key skills you will need in your direct reports. Skills such as the ability to lead a team-not an easy task at any level. As well, it develops the skill of thinking from a strategy and innovation angle. This you will see as key organizational capabilities sharpened.

   Capabilities are the things not necessarily what your organization already does well but, those things it must get exceptionally good at doing. An assignment such as this, will prime your high potential employees to get very good at just what your organization needs to be successful.

2. **Managing a Corporation-Wide Function:** Imagine, what better way to stretch your high potential employees than have them engage cross functionally within the organization, bringing everyone on board via an event/function? This brings to mind one organization with whom I have had the privilege to work for the past four years.

   Four of this organization's high potential employees-all from different departments, joined forces to organize a social event for the entire organization and community. Last count, they had over 500 hundred paid and attended the event.

   On the surface, this may look just like a social event yet, the skills developed in this undertaking includes their ability to think strategically, collaborate with and influence others, leadership from a change management perspective as well as bringing others on board-inclusiveness. These are critical skills leaders need in order to move up and lead others in their organization.

Now it's your turn, I would like to hear from you:

1. When you reflect on your organization and its talent pool, what opportunities are currently in place for you to develop high potential employees?
2. What is your 3, 5 and 7- year plan for these employees?
3. How will you measure your organization's success as a strategic thinker?
4. Is your organization built to last?

Our aspiration is to: To support organizations and their employees deliver consistent value to both their internal and external customers, shareholders and communities.

The Next Stop on the Metro Network? 5G Mobile

Moshe Shimo
VP Product Management
ECI

The future looks more than exciting for service providers looking to offer 5G services, as long as they evolve their metro networks in good time.

Google '5G' and you'll find plenty of scholarly articles about the era of the fifth generation mobile network. It's the same story in many ways as before, with each mobile generation seriously increasing data transfer rates from its predecessor. But 5G is different – because of its promise to make all those previous leaps look like baby steps. In doing so, it will enable a whole new host of technologies and services that, until now, have been confined to small-scale or lab-based demos by boffins in white coats.

New services = new revenue streams

Let's not beat about the bush. 5G technology really will herald the arrival of a range of truly exciting and revolutionary new services – for consumers, for businesses, for industry and for public services. And with these new services come major opportunities for service providers keen to diversify their service portfolios and create new ways to generate revenue. In fact, Ericsson and Arthur D Little (2017) estimate the 5G-enabled industry digitalization revenues for ICT players will be US$1.3 trillion by 2026. With new services and business opportunities being created in the automotive sectors, critical industries, utilities, government and strategic industries as they look to 5G to underpin their modernization.

HubSpot Call-to-Action Code

So service providers who manage to cut themselves even a sliver of the 5G pie can expect a generous helping of revenue. But as with any great technological leap (and let me say again, it will undoubtedly be a great leap), 5G will come with its own unique set of challenges. Challenges that will play out on the metro network and force service providers to rethink how they gear up to provide these new services.

But before we focus on the how, let's remind ourselves of some of the cool new services and verticals that 5G is set to revolutionise.

1. Media and Entertainment

Download speeds will be at the very least 10 times faster than 4G – and are likely to be up to 100 times faster. So downloading an HD movie will take seconds. There are already plans to provide fans attending events with live on-demand replays to their mobile devices. Imagine, 80,000 people asking for the same 4K replay at the same time. And we're already seeing augmented reality (AR) and user-generated content (UGC) on the 4G network. 5G's high-bandwidth, low-latency capabilities will take this to another level, with immersive AR supporting services like virtual reality (VR) multi-player mobile gaming. We'll also be able to take our media with us, switching devices as we go.

2. Education and Training

Connected classrooms and training centres offer exciting opportunities. From smart campuses and classrooms, to lessons using VR and AR, to personalised learning plans, to remote classrooms and better services for students with special needs, 5G will help open up access to high-quality education for all.

3. Self-driving Vehicles

With 5G, autonomous vehicles can now become a 'this is really happening' technology. We already se the start of this with trails for trials for 5G enabled autonomous trains. And we would all welcome cars that could talk to each other to avoid collisions, or vehicles that provide relevant, up-to-date travel information to roadside displays and directly to our cars, based on real-time data, traffic management systems, roadside sensors, weather reports and other sources. None of this will happen until 5G networks are ubiquitous. And once they are you can be sure that not long after, self-driving vehicles will become a regular sight on our roads.

4. Utilities

5G's ability to support the Internet of Things (IoT) will provide a step change in how we generate and consume energy. For example, intelligent energy management systems the bedrock of the smart grid will use 5G and IoT to gather information from sensors to allow them to manage and control distributed and renewable energy sources on the network. Plus, the next generation of smart meters will collect information on how buildings are consuming energy, and analyse and optimise energy use to make our homes and offices 'smart'.

5. Healthcare

A world where we each have a personal health monitoring device is no longer beyond the realms of science-fiction. A device that tells us when we're ill, dispenses medication and even calls first responders in medical emergencies. Many of us already have heart-rate monitors in our watches, collecting data on our activity. 5G will broaden the possibilities as never before. Thanks to its ultra-low latency capabilities, 5G will make remote diagnosis, remote surgery and anaesthetic control even more prevalent, including allow more complex procedures.

6. Industry 4.0

While Industry 4.0 is isn't yet there, 5G will be a key enabler in data collection and transfer, and continuous monitoring and control in the factories of the future of IoT, robotics, analytics and machine intelligence. Of course, 5G won't revolutionise manufacturing on its own, but it should provide the unified comms platform needed to disrupt existing business models and overcome the limitations of current comms technologies.

7. Smart Cities

It's in our cities where 5G will have the biggest impact. Imagine hyper-connected urban areas where everything's interconnected – traffic management systems, transport services, driverless cars, utilities, homes, healthcare and municipal services. And all them working together to help reduce costs and consumption, improve public services and wellbeing, and create a better quality of life for citizens.

A Metro Fit For 5G mobile

As you'd expect, all the 5G services and verticals outlined above will massively increase the data load (mainly fuelled by mobile web and video) running on the metro network. But it will also require a highly dynamic approach and major flexibility to connect and cater for this vast new array of services. Services that by their very nature will demand increased compute power able to move around the network.

With 5G, you have a huge variety of services all requiring different levels of capacity, latency and flexibility. For example, video streaming in HD and 4K need huge amounts of capacity. Remote surgery and self-driving cars need ultra-low latency connectivity. Mission critical utilities need hardly any bandwidth, but unbelievably high reliability. What's more, many of these services will need to be brought up or down in real-time, so the amount of traffic you need to backhaul on the metro will constantly change.

Flexibility, latency and capacity – the dynamic trio

The result of all this is that to achieve many of these capabilities you've got to move some of your compute power as close to source as you can. For example, in the case of self-driving cars, you need your compute power right at the edge of the network (in the car, even). So backhauling the traffic from the radio access network (RAN) to the core for processing simply won't give you the ultra-low latency you'd need for self-driving cars.

So, on top of supporting the increased capacity from the IoT and tens of millions of new mobile devices, the metro network has to be able to be extremely dynamic to allow compute power to be put where it's needed – and turned up or down as required.

YeSDN! 5G has been one of the drivers for rolling out software-defined networks (SDN) on a large scale. SDN will allow you to define the capacity, connectivity and processing power and, thanks to virtualization, you can put those virtual compute resources where you need them. Virtualization that, in turn, allows you to introduce the mobile access edge computing (MEC) required to hit the latency requirements for certain services and split the control and user plane processing. I've written about MEC considerations for metro networks here.

Grasp The Nettle or Get Stung by Evolution

As I've already mentioned, 5G is a great financial opportunity and will offer serious service differentiator for switched-on service providers ready to make the most of it. My colleague, Jimmy Mizrahi, in his article 'Why waiting for 5G is the wrong metro network strategy', recommends you start adding value to your current service offerings. That way you can use the metro evolution to diversify portfolios, create new revenue streams, and compete on more than just price. He also suggests having a clear path to SDN functionality.

Ultimately, service providers can truly succeed if they evolve their metro networks to meet the obstacles and opportunities that 5G will bring. Those who rest on their laurels, will be quickly left behind and find catching up will be nigh on impossible. I know which group I'd rather be in HubSpot Call-to-Action Code

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CALENDAR OF EVENTS

CANTO's 35th Annual General Meeting		**27th- 29th** January 2019
GSMA Capacity Building Training Unlocking Rural Mobile Coverage		**30th** January 2019
CANTO 13th WTISD Regional Video Competition		**17th** May 2019
CANTO 35th Annual Conference & Trade Exhibition Hyatt Regency Hotel, Trinidad		**21st -24th** July 2019

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