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ITU News
MAGAZINE

How ICTs are accelerating the SDGs



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#ICT4SDG

03/2017



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- Ulrich Rehfuess, Head of Spectrum Policy, Nokia
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Moderation: Martin Sims, Managing Director, PolicyTracker

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- Thomas Schmidt, Regulatory Affairs and Spectrum Manager, SIGFOX
- Dr. Steve Methley, MBA, Director, Quotient Associates Limited

DTT of the future – more or less?

Moderation: Richard Womersley, Director Spectrum Services, LS telcom

Confirmed speakers include:

- Chris Vinall, Customer Solutions Architect, Cisco
- Alex Buchan, Head of Wireless Technologies, DTG
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ICT Contributions to the SDGs



fast forward together

#ICT4SDG

Why ICTs are so crucial to achieving the SDGs

Houlin Zhao, ITU Secretary-General



"I hope this edition inspires you by showing what's possible – and what's being done to build on the success."

Information and communication technologies (ICTs) have enormous potential to fast forward progress on the United Nations' Sustainable Development Goals (**SDGs**) and improve people's lives in fundamental ways.

Building the next generation of ICT infrastructure will power the evolution of smart, sustainable cities and communities worldwide. Making modern ICTs more widely available will foster the local innovation needed to spur domestic economic growth, provide decent work and reduce inequalities.

While we still have a long way to go – some 3.9 billion people are still unconnected to the Internet – we have made great strides.

This special edition of ITU News Magazine highlights that progress. It lays out specific examples of how governments, entrepreneurs and other stakeholders are using ICTs to accelerate the achievement of SDGs, and it tells the stories of individuals whose lives have improved as a result.

While this edition doesn't cover every SDG in depth for space reasons, it does highlight ITU's key role in setting the development agenda that will position ICTs to accelerate all 17 of the SDGs.

In addition, you'll find a diverse range of thought leadership on the importance of **SDG 9** (Industry, Innovation, and Infrastructure), which is a key focus for ITU as we leverage our unique core competencies in spectrum management and international standards to maximize our contribution to the UN's efforts to achieve the SDGs.

I hope this edition inspires you by showing what's possible – and what's being done to build on the success.

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ITU/Julie Marchand

Aadhaar: India's route to financial inclusion

By Lucy Spencer

ITU News

With no pension, Surat Singh, a former Delhi Transport Co-operation driver, had no way to support his two children and four grandchildren, all of whom live together in their small house in the rural village of Surakhpur, an hour outside of Delhi, India.

"We used to be able to run our household well," says Mr Singh's wife, Raj Kumari. "After he [Singh] retired from his job, we did not have a way of earning a living."

To make ends meet, Singh and Kumari opened a small shop three years ago.

Now, a new digital payment service set up by India's government has dramatically boosted their business. In just four months since the cashless payment machine was installed, they have boosted their monthly income by 15–30%, money that has helped transform the lives of his family.

"The cashless payment machine which has been provided in our village has been very beneficial for us," Singh says. "The ones who don't have cash on hand are able to buy goods through this method… so it is helpful to us, and the customers, too."



A global model?

Singh is just one of millions of Indians who've seen their lives improve in fundamental ways since the government started a biometric identification system called Aadhaar in 2010. Aadhaar has since been linked to digital payment systems as part of a broader push for digital financial inclusion under the auspices of the **Digital India programme**, with a vision to transform India into a cashless, digitally empowered society and knowledge economy. The combined efforts are now seen as a model for other emerging markets worldwide as they, too, seek to improve the lives of their citizens, including many of the world's 2 billion unbanked.

The early success – and tremendous scale – of India's efforts are especially important to note at a time when digital financial services are increasingly seen as a key driver in the fight to alleviate poverty, the United Nations' Sustainable Development Goal No. 1 (**SDG 1**).

"You can open a bank account using Aadhaar, and if you link your mobile number with Aadhaar, mobile becomes another digital identity… So financial inclusion, identity number and the mobile – all three are very powerful, empowering tools in the hands of the people," says R.S. Sharma, Chairman of India's Telecommunications Regulatory Authority (TRAI). "I think it's a really win-win situation for all of our people, and I see India being transformed."

Digital payments transformation

Indeed, despite having the 7th-highest GDP (Gross Domestic Product) in the world, India still had some 233 million unbanked citizens as of 2015. But that's changing fast. More than 50% of India's Internet users will use digital payments by 2020, according to a new report by Google and the Boston Consulting Group, which also predicts that the digital payments industry could be worth up to USD 500 billion by 2020, contributing 15% to the country's economic output.

Better systems for digital financial inclusion are paving the way for a boom in digital payments and e-commerce.

Investment is pouring in, with Amazon recently injecting USD 10.5 million into its India payment arm and Tencent, eBay, and Microsoft recently investing USD 1.4 billion in the homegrown e-commerce company Flipkart.

India's payment revolution has supported communities across the country. Around Delhi, many shops and market stalls have digital payment terminals or QR codes. The convenience of digital payments is helping Jigyasa Grover with her studies.

"I bought all of my books this term on payTM!" she told ITU News recently. "The safe and easy option of conducting financial transactions digitally, along with not needing to carry wads of cash, plastic cards, or even queue up for ATM withdrawals, is the biggest motivator for me to use PayTM. Also, lots of discount coupons and cashback schemes makes it all the more fun to use!"

1 NO POVERTY

Behind the success: Aadhaar

Without formal ID, many Indians struggled to open a bank account. In response, the government launched Aadhaar in September 2010, the foundation of the nation's financial inclusion.

Aadhaar is a 12-digit, unique identification number underpinned by biometric authentication which provides a secure, safe and unique proof of identity for India's citizens, with no criteria for eligibility. This means that a thumbprint or iris scan at the point of service delivery can act as ID, for example when opening a bank account, or as a digital signature for a paperless cash transaction. Today, over 1 billion people in India have signed up to the programme and there are roughly 13 million authentications via Aadhaar every day.

The programme is driven by a national vision to have a cashless society – or rather, a "less cash" society, Sharma says.

"The government of India is really pushing cashless and digital transactions in a big way and I think Aadhaar and mobile penetration in this country, and financial inclusion have made it very easy to have these things done. Under the JAM [Jan Dhan, Aadhaar, Mobile] scheme, the government has opened 240 million bank accounts in a matter of a few months. So in that way, everyone in the country who has a bank account, now has mobile phone, and now has Aadhaar. So it is a complete picture."

Moreover, Aadhaar's platforms are inclusive, offering multiple options for people to make payments. Smartphone users can make payments via Unified Payment Interface (UPI); Unstructured Supplementary Service Data (USSD) is available on a feature phone; and those without a mobile phone or payment cards can make payments through AadhaarPay.

ITU/Julie Marchand



Saving the government money

The programme is also beneficial for the government, which uses the information on Aadhaar as a ledger through which to clean benefit delivery system databases of duplicate and fake accounts. Every year, the government conducts roughly 1.5 billion individual credit transactions for LPG (gas), with the 120 million eligible citizens receiving 12 gas cylinders a year. After linking LPG gas direct benefit transfers with Aadhaar cleaning out the database, the government made a saving of INR 20 thousand crores (ten million) in one year – twice the cost of Aadhaar.

"So there is a huge substantial saving to the government without compromising the benefits to people," Sharma notes. "It has reduced the cost of delivery, it has made subscription to those facilities paperless, and it has saved the government from duplicates and costs."

Transforming lives through Aadhaar-enabled digital payments

Surrounded by sugar, flour, cold drinks, children's snacks, and basic stationery for school children, Singh reminisces on the benefit that digital payments have had on his business and his customers, who used to have to travel 4 km to the nearest ATM.

"It is really beneficial. We don't have either a bank or an ATM here in the village," Singh says. "Every family has a provision to pay through digital payment. Some very old people do not know how to use digital payment, but everyone else does use it."

This has had a significant impact on his revenue. "Installing the machine, there has been some increase in sales. So earlier, we used to conduct sales of about INR 2000 (USD 31), now it goes up to INR 2500–3000 (USD 39–46), which has been possible because of the machine," Singh said.

Villagers also see the benefit of this cashless payment system.

"Digital cards are very convenient. We don't need to carry cash with us. Whatever we want to buy, with just the swipe of the card, the work gets done," says another Surakhpur resident, Ranbhir Singh. "It used to be dangerous to carry cash around, lest someone would steal it, but we don't have to worry about that [now]."

Connectivity is key

However, network connectivity issues can often interfere with Singh's business, meaning that Singh can lose a sale.

"We are facing network connectivity issues. There are no telecom towers in about 4 km range and sometimes, that leads to poor connectivity," Singh tells us. "The network is intermittent. It usually works and sometimes loses connection… There is a mention of installing a tower. Only then the problem will get solved."

Steps are being taken to ensure reliable and robust mobile connectivity throughout the 3.28 million km² country, says Sharma.

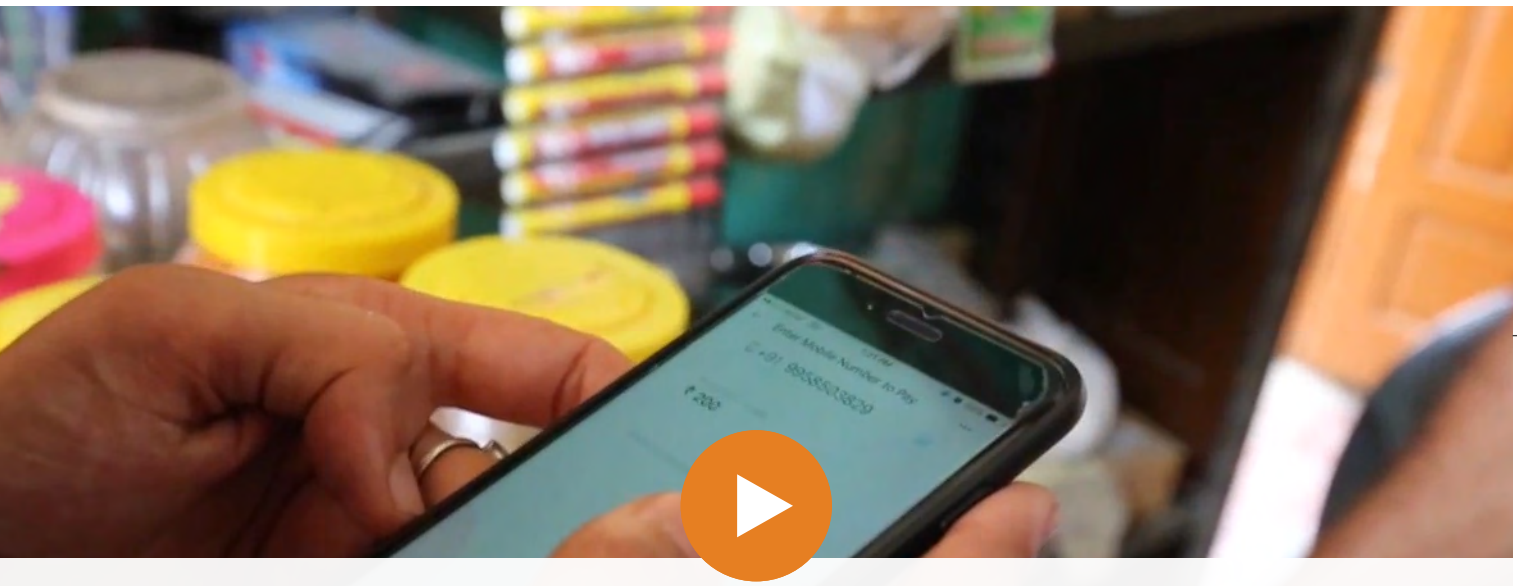
"We have a voice connectivity spanning to more than a billion people. So everybody in this country, more or less, has voice connectivity through mobile," he says. "We also have data connectivity – of course, the speeds and everything are not reliable in some parts of the country. So we, and the telecom operators, are working to ensure that we have better data delivery."

This is being achieved through a growing network of undersea cables, and TRAI has made recommendations for using digital cable TV as a broadband delivery system. WiFi hotspots throughout the country also provide cheap data through WiFi, but there are currently less than 10 000 across India.

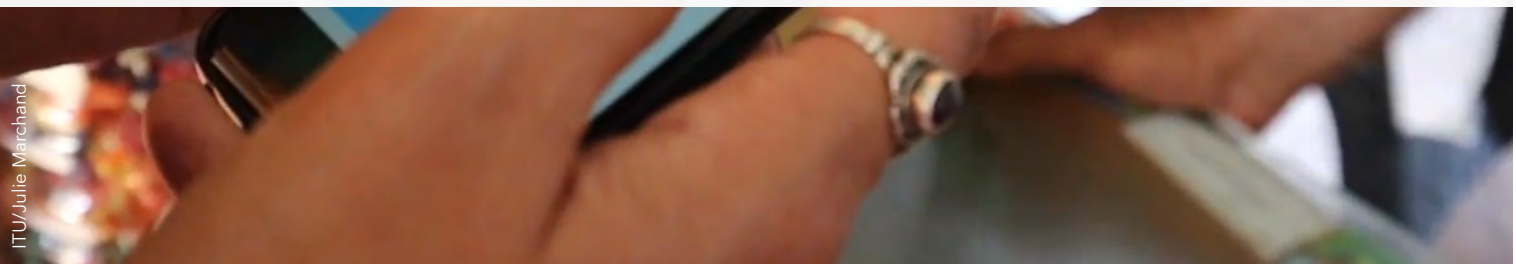
The country needs "at least a million, so I think there is huge scope for increasing these WiFi hotspots," Sharma says.

"What we are visualizing is actually a grid of WiFi hotspots, which means that you have to authenticate your identity once, and you will have to attach your payment instrument once.

So, authentication and accounting is taken care of on the cloud," Sharma says. "In a way, it will be an unbundled model, where certain work can be done by aggregators, and the guy on the field is basically putting his WiFi hotspot router and just powering it, and that's about all."



Aadhaar: India's route to financial inclusion



ITU/Julie Marchand



ITU/Julie Marchand

Food for all: how mobile technology can combat hunger

By Lucy Spencer

ITU News

Globally, **1 in 9 people** go hungry every day, according to the World Food Programme. That's nearly 800 million people. And yet, some 1.3 billion tonnes of food are wasted every year.

To combat this problem – and to make progress on the United Nations' Sustainable Development Goal No. 2 "**Zero Hunger**" – information and communication technologies (ICTs) are now increasingly being deployed to better connect the hungry to excess food at a scale and speed never before possible.



As part of a growing global trend from San Francisco to Paris to New Delhi, social entrepreneurs are harnessing the power of mobile technology to feed the hungry.

No Food Waste is a prime example. The social start-up aims to address urban hunger in India with a simple concept: take excess food from wedding parties, parties, restaurants and colleges, and redistribute it to those in need and at risk of hunger – the homeless, poor, and the elderly.

"We want to reduce the hunger and people dying from hunger. So that's why we created the app," says Guna Sekaran, Director of No Food Waste's Delhi chapter. "Nowadays, everyone is using mobile phones, so through the phones, we create awareness."

How it works

Donors input information on the No Food Waste mobile app, such as location and amount of food, which is then picked up by a local volunteer and delivered to a local hunger spot.

Currently available in eight cities across the country, the platform, as of 31 May this year, has helped to feed 285 383 people across the country since launching in 2016 according to official No Food Waste statistics. 10 000 meals have been provided in the Delhi area alone, says Sekaran.

"The organization's dream is that no person should remain hungry, that people should get proper, nourishing food," Sangeetha Singh, Director of No Food Waste's Noida chapter, said. "We want to create an awareness that instead of wasting, you can give to beggars and the underprivileged."

On the road with No Food Waste

On a bright day in March, ITU News met with Satish Anburaj who has helped feed 50 people a week with surplus food from his South Indian restaurant, Sri Balaji, in central New Delhi, since 2016.

"Loads of food had been wasted by the team. So I decided to join with the No Waste Food organization. In India, lots of people are under the poverty line, and we like to help," he explains. "I like to provide them food because they are also human beings. I like to be a chef because I like that people eat my food. It feels really good that people are eating my food."

Without the ability to refrigerate and store the donations, the food donated to No Food Waste can't travel far in Delhi's heat. With time an important consideration, the No Food Waste team has generated a map of local "hunger spots", such as orphanages, shelter homes, slums, and hospitals.

With a spicy aroma of fresh food floating through the minivan, Sekaran used the mapping tool to identify an Ashram in central Delhi where elderly residents eagerly awaited their meal. Upon arrival, they welcomed the delivery with big smiles before tucking in to the food.

www.facebook.com/nofoodwaste.in

Helpline Number: 90877 90877

"We have a very happy life," said one resident between mouthfuls of spicy rice.

"When we are giving the food to some people they are very excited and we are really excited for them," said Vijay, a No Food Waste volunteer who helped with the delivery.

Global response

Other food start-ups around the world are using mobile technology to help to solve food insecurity.

Over 12 million meals have been redistributed in Ireland and the UK through **FoodCloud**, a company that connects charities to supermarkets with unsold food.

Copia has completed over 3200 food pickups in San Francisco, USA, through its mobile app, and recently redistributed excess food from the 2017 Oscars.

Meanwhile, in West Africa, poor road conditions and refrigeration can often mean that food spoils before it can get to market. **Cheetah** allows farmers, food transporters and traders to share value chain information, such as the fastest route to market, and is currently being tested in Ghana.


ITU/Julie Marchand

How technology is tackling hunger in India





ITU/Julie Marchand

Saving premature babies in India

By Lucy Spencer

ITU News

The five-day old baby weighs just 1.5 kilograms – too small to breathe on her own. She is still in critical condition, but doctors at Kalawati Hospital in Rewari, India, hope she will be home in a few days.

Next door, machines whir around a much smaller premature baby. Sadly, it is unlikely she will be reunited with her parents, the doctors say.

Complications from pre-term births are a leading cause of death among children under 5 years old globally, and India has the highest number of **preterm births in the world**, with some 3.5 million babies born too early annually.

On average, one to two babies are admitted to the neonatal intensive care unit (NICU) at Kalawati Hospital every day. At this rural hospital, the survival rate of preterm babies is roughly 80%, but for babies between 1 kg and 1.5 kg, an average of 50 to 60% survive.



However, Dr Gautam Yadav, Consultant Pediatrician at Kalawati Hospital, is confident that a new platform, the **Integrated Neonatal Intensive Care Unit** (iNICU), can help save the lives of some of these babies.

How the iNICU platform works

iNICU is a "combination of all the buzzwords which are in the market, like IoT, cloud, predictive analytics, artificial intelligence – to save a baby," jokes biomedical engineer Harpreet Singh who developed the real-time data platform with his wife, computer scientist Ravneet Kaur.

iNICU collects medical data so that it can be easily shared with medical professionals. The platform has two key components: the Integrated Child Health Record (ICHR) application, and the iNICU platform. The ICHR application supports the digitization of medical information which is largely absent in India, by allowing doctors and nurses to input vital calculations such as weight, calories, nutrition and medication.

"In bigger hospitals where data is already digitized, the second step is extracting the device data, saving time and effort of doctors and nurses, which will help them to make quick decisions for timely intervention to prevent any infection," Kaur said.

"Unless you have data, you can't make a change in this society," Singh said.

Driving the change to save more lives

For Singh and Kaur, driving this change is personal: the couple lost a child after Kaur delivered premature twins in 2010.

"I remember when we were doing the pilot test for our product in different hospitals. It was very difficult for me to sit in that environment because of the noises," Kaur told ITU News.

"All my memories were freshening up… For the parents who have been through the same painful journey, this thing can help them improve the life of a child, and the survival rate of a child. The mission is to reduce mortality."

Singh and Kaur use their son's visits to the pediatrician to inform the development of the product.

Singh explained that the Integrated Neonatal Intensive Care Unit (iNICU) platform was built for both NICU and post-NICU environments. "We help parents make the right informed choices from what is happening with their baby. As parents we didn't have the data before, and were not informed of the issues that were happening with our child. We still have grey areas, even [now] when he is six. We want to leverage technology to fill that gap."

And that's exactly what they are doing.

By linking vital statistical outputs of various medical devices, the iNICU platform also improves clinical care time. This information is then used to predict the onset of diseases and infection.

"The specialist in the game is the doctor. We are servants to helping him make the right clinical decision," Singh said.

Filling a vital need, 'it fits like a glove'

For Dr Yadav, the platform helps fill a vital need. "There is a misconception that poorer settings can do with poorer technology," he says. "Actually, the poorer a setting, the better technology you need because you have to fill up all those gaps… Medical errors will be reduced… In a resource-limited setting where you have poor record keeping, and poor monitoring of a patient, if a systematic thing like this comes in, it will definitely save lives." Yadav is now a champion of the technology. "It is a great aid customized for the needs of a neonate, which most systems are not, and it fits like a glove!"

There are 26 hospital accounts on the ICHR application, including Mumbai and Delhi, and iNICU is live in three hospitals, with additional orders placed.

"There is not one single solution parallel to iNICU available on the Indian market," Kaur noted. "Solutions are available in Australia, the United States and China, but there's no solution in India which is fixing this problem."

Singh and Kaur rely on the Kalawati Hospital to help them improve their product, because of the difficult conditions.

"Every new application we try … actually gets vetted first by this hospital because it is the most difficult environment for us," Singh said.

But babies around the world require neonatal care. Could their solutions work elsewhere? "I don't think we will be limited to India, we want to go global," he said. "Good engineering, good people, and a good ecosystem is not limited to one geography."



How technology is saving young lives in India



ITU/Julie Marchand



ITU/Jane Muriuki

Singapore's Lab on Wheels makes tech fun

By Lucy Spencer

ITU News

Sitting in pairs in an air-conditioned bus, young students giggle as a mini robot they programmed slides across a small table, changing its LED light colour each time it alters course.

These students from the Rosyth School are being introduced to computer programming with a simple, walnut-sized robot. It's part of Singapore's increasingly popular **Lab on Wheels programme** – a mobile classroom that travels across the country to introduce students to technology through fun and engaging activities.

"Robotics is very fun and you keep on learning new things and new stuff for the robot to do," says Shyam, a student at the School. "And it is pretty cute when you see the robot move and the robot accomplishes all its movements."



It's more than just fun and games, however. It's part of a larger digital skills initiative that Singapore's Infocomm Media Development Authority (**IMDA**) takes quite seriously as the city-state advances on its **Smart Nation** mission.

Lab on Wheels is an introductory step that leads to the larger **Code@SG** initiative that aims to make coding and computational thinking a national capability. The IMDA views this as critical to ensuring that the next generation will be relevant in the digital economy.

Beyond the statistics – some of which claim that 95% of jobs already have a digital component – IMDA's CEO Tan Kiat How says he understands the importance of investing in technology skills from personal experience.

"I think coding, and in a way computer engineering, has taught me some valuable skillsets. It helped me think about the world, it helped to solve problems, and also, in a way, imagine a different solution to a problem. And I think that's a very fundamental capability or mindset that's actually much needed in a future workforce, regardless of whether you are in the ICT sector," he said. "The whole of Singapore ought to have that kind of skillset."

ITU/Julie Marchand



To achieve Sustainable Development Goal 4, by 2030, we need to increase the global proportion of youth and adults with ICT skills

ITU can help you along that path:

Capacity Building in a Changing ICT Environment 2017

What is Lab on Wheels?

The IMDA launched the first Lab on Wheels bus in November 2014, but quickly expanded to four buses – two for primary school children and two for secondary school children – in May 2016.

The primary school buses are retrofitted as a mobile classroom with tables and chairs, and computers and screens. The secondary school buses are retrofitted as a mobile fabrication lab with 3D printers, laser cutters, virtual reality (VR) goggles.

The four-bus fleet travels to schools across the country, and to date has visited over 150 primary and secondary schools and reached more than 50 000 students. The team hopes to target 80% of Singapore's 180 primary schools by 2020.

"Hopefully one day, [the students] find that many of the skillsets they picked up through some of these interactions with technology can be applied in very different domains," says Kiat How.

How is success achieved?

"Ultimately, the programmes and their successes, rest on a tripartite partnership between the government, the companies and the people," says Kiat How.

The programme is supported by both small-medium enterprises (SMEs) and multinational corporations, who work together on such initiatives as the co-creation of workshop activities and loaning the laptops that the children use to programme the robots.

Moreover, the Lab on Wheels trainers are all IMDA staff, who work as facilitators in the morning and double up as project managers, tech engineers and curriculum developers for the programme in the afternoon.

On the road with Lab on Wheels

Back on the bus, the 30-minute class was nearly over. The students chatted excitedly about the tasks they had just performed with each other, comparing their progress as they disembarked.

"To find the robots moving, responding according to how they programmed it, I think they find tremendous joy in their learning during this programme." Julia Ng, Senior Teacher and ICT Mentor at Rosyth School said.

The workshops have had some impact in increasing students' interest in computer science. While some already pursue robotics as an after-school activity, the programme has been an inspiration for others.

"When I saw my brother working on technology, I thought it was really complicated and sometimes even he couldn't figure it out," Jessica, a student at Rosyth School told ITU News.

"I had never actually programmed a robot before, and on second thoughts now, I am actually thinking about joining robotics as my CCA (Co-Curricular Activity)."

Indeed, the impact has already been felt beyond the mobile environment, as Ng explained.

"In this digital time and age, because of the motivational level that has been heightened through ICT in the classroom and school grounds, they have gone on to pursue ICT in their higher education level. When they come back to visit us, they have so much to share about how ICT has impacted in their learning journey," she said.

Students taking part in the programme now are already keenly aware of the positive impact of technology beyond education.

"I think that technology can be fun sometimes and it can help people in our lifetimes," Jessica said.

Ultimately, the best endorsement comes from the students: "I do love Lab on Wheels. It was fun as we learned how to programme." Shyam beamed. "I want to programme cars – that's my favourite dream – and build them. So yes, I want to be a technologist when I grow up."



ITU/Julie Marchand

Singapore's Lab on Wheels teaches children the skills of tomorrow





ITU/Julie Marchand

Why we need more women in tech: voices from SE Asia

By Lucy Spencer

ITU News

Closing the digital gender divide is crucial for progress on United Nations' Sustainable Development Goal No. 5: to "**achieve gender equality and empower all girls and women**." And yet, there's a long way to go.

The global Internet user gender gap was 12% in 2016, according to **ITU data**.

Women currently only make up some **30%** of the European Union's information and communication technology (ICT) workforce, and also women are vastly underrepresented in the **Silicon Valley tech jobs**.

The good news? Closing the digital gender divide is a significant opportunity for growth in today's economy.

"I think we need more girls in tech, because we definitely have to start filling up the pipeline, all the way from the most junior fresh graduates, all the way up to the C-suites, and even up to the Board," says Jocelyn Teo, Advisory Board Member for **Girls in Tech–Singapore**. "Studies have shown that companies that have more diversity … throughout different levels, all the way up to the Board, are actually more profitable."

On average, female-led, venture-backed technology companies in the United States have 12% higher annual revenues and use one-third less capital than their male counterparts' startups, entrepreneur and venture capitalist Cindy Padnos found in a 2013 **white paper**. Additionally, more women in the digital jobs market could create an annual Euro 9 billion boost to the EU's Gross Domestic Product (GDP), according to an **October 2013 EU study**.

Regional examples

As India, Malaysia and Singapore establish themselves as **technology hubs** in the South and Southeast Asia regions, these early days are a good time to insert women seamlessly into the tech employment equation. On a recent trip to the regions, ITU News asked women tech leaders why we need more women in the industry – and how to achieve it.

The numbers are already encouraging: some **30%** of India's tech workforce is female, compared to only about 21% in the United States. Singapore, meanwhile, had a 30% female representation in tech according to a 2014 survey by the Infocomm Development Authority of Singapore (IDA).



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Keeping women safe in Delhi? There's an app for that.

"If you make a city safe for women, you are actually making it safe for everyone," Dr Kalpana Viswanath co-Founder and CEO of **Safetipin**, told ITU News.

Violence against women is a problem worldwide and is a serious issue in India. A **2012 UN Women**-supported survey conducted in New Delhi found that 92% of women reported having experienced some form of sexual violence in public spaces in their lifetime.

"Safetipin directly contributes to [making cities and public spaces safer] by putting a tool in the hands of women to do something about their own safety, and to be able to share data, and to use this data to make more informed and safer decisions about their lives," Dr Viswanath said.

People can use the app to track and monitor the safety of their city, akin to a crowd-sourced audit via the "Safety Score" feature. Users are asked to rate 9 parameters linked to safety including an area's lighting, people density, and transportation.

Then information is then used to generate a safety score and produce safety maps in which users input their destination and the app suggests the safest route.

The "Track Me" feature uses location data to enable users to select a trusted person to monitor their route on a map and find their exact GPS coordinates in case of an emergency.

The information gathered through the app is also provided to the relevant government authorities to help them improve the safety of an area, which can be as simple as fixing a broken streetlight.

The app is available worldwide, and can be downloaded for free from the Google Play store and Apple store in three languages, English Hindi and Spanish.

[To learn more, read the full article on the ITU News website]

■



ITU/Julie Marchand

Keeping women safe in Delhi? There's an app for that.

"It's about changing mindsets," says Wan Ting Poh, Managing Director of **Girls in Tech–Singapore**. "Girls can do technology as well, and they shouldn't be afraid to do technology."

This is not always easy, however, even for qualified women who face an isolating, male-dominated ICT workplace environment. "There are not a lot of girl data scientists around," says Ms Poh. "I lead a team of six people, and I'm the only female."

So how can progress be achieved?

"What's most important, is that girls or the young people have the chance to pursue their interest and to build confidence. A lot of the time they show a passion for it, they show interest for it, but somehow, along the way, it was being shut down, either because of stereotypes, or cultural perceptions," Ms Tan said. "But you should pursue your interest if you like science, if you like maths."

Overcoming these stereotypes requires an enabling environment to help women enter the industry.

"There needs to be a place where ladies can come together and inspire more ladies," Ms Poh said. "It's not because of reasons like we are not physically strong enough to do it, it's not something that we cannot work on. It's more reasons like maybe they feel scared to come into this industry that is male dominated, and they don't have this support system there to tell them that, yes, they can do it as well."

And this does have an impact; Singapore's government is also working to encourage young children to participate in tech through fun and engaging activities such as their Lab on Wheels programme (**see article**). One result is that young girls can see and develop their capabilities, and change mindsets.

"When I saw my brother working on technology I thought it was really complicated and sometimes even he couldn't figure it out," Jessica, a student at Rosyth School told ITU News. "I had never actually programmed a robot before, and on second thoughts now, I am actually thinking about joining robotics as my CCA (Co-Curricular Activity)."

Rise to the challenge, reap the rewards

Ms Poh's has some words of encouragement for women who are considering a career in this exciting and fast-paced environment: "Don't be afraid to step up and say, 'can do it too!' "

Despite the difficulties, encouraging more women in tech can have a profoundly positive impact beyond boosting the national GDP. The individual benefits of a career in tech can be enormous. "It's been a rewarding journey. It has taught me how to look for things myself and not be dependent on others. The Internet has opened a door to the world. It has opened lots of opportunities," says Jigyasa Grover, Director of **Women Who Code Delhi**. "More women in tech means more ideas and more awesomeness!"

EQUALS

GENDER EQUALITY IN THE DIGITAL AGE

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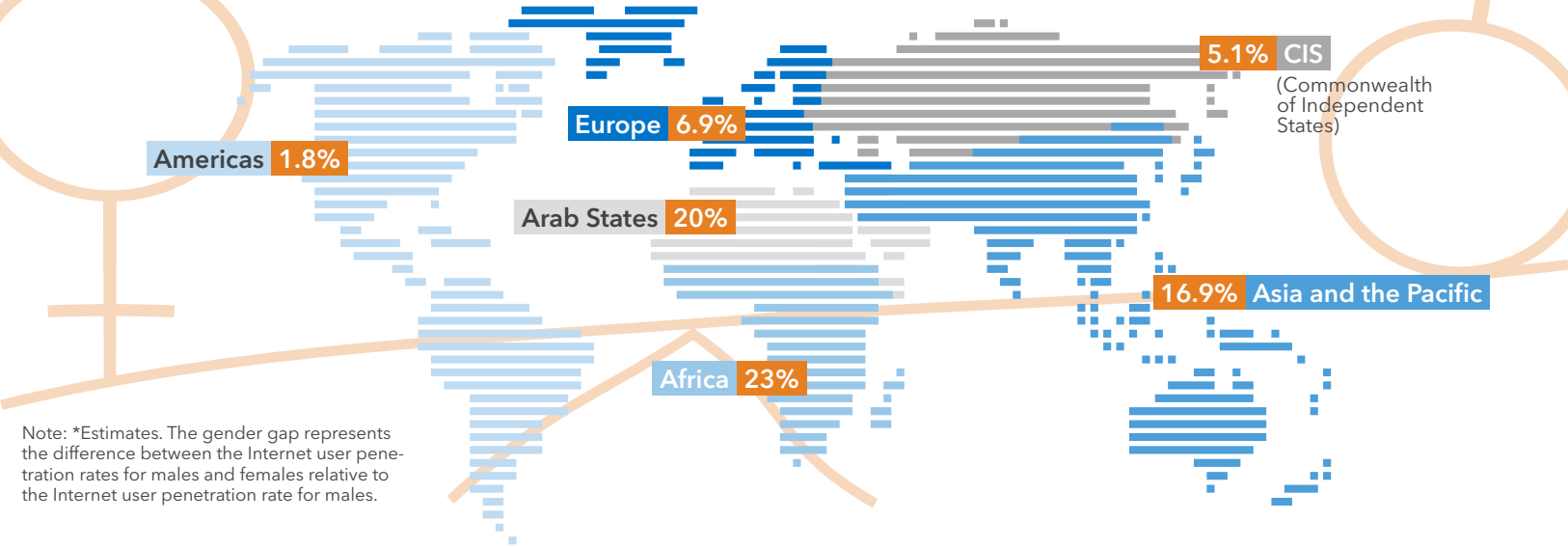
Information and Communication Technology access for gender equality

Enhancing the use of ICTs ...

... can help to close the digital gender gap ...

... and empower women.

The 2016 global Internet user gender gap* is 12%



Note: *Estimates. The gender gap represents the difference between the Internet user penetration rates for males and females relative to the Internet user penetration rate for males.

Structural inequalities in

- Literacy
- Education
- Employment
- Income level

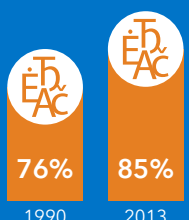
Have contributed to

Gender inequality and the Digital gender gap

- 31% Least-developed countries
- 16.8% Developing countries
- 2.8% Developed world

Literacy

The adult literacy rate has risen to 85% from 76% in 1990



But women account for **over 60% of the world's illiterate**

Adult literacy rate (women) in 2013

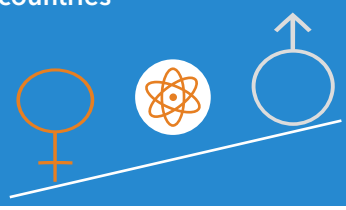
- 99% Developed countries
- 77% Developing countries
- 53% Least-developed countries

Education

All developing regions have or have almost achieved gender parity in primary education



But the gender disparity widens at the secondary and tertiary school levels in many countries



What can you do to help close the digital gender gap?

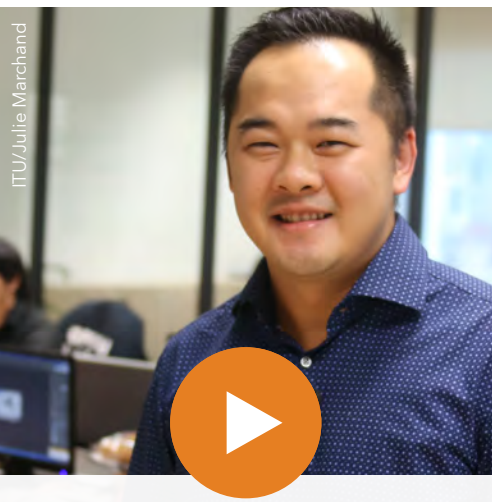
Sources: ITU/UN Women


ITU/Julie Marchand

Jobs for the digital economy: New skills, new success

By Lucy Spencer

ITU News


ITU/Julie Marchand

Good local content is key to connectivity!

From finance to health care to banking and auto, digital solutions are now propelling growth throughout all sectors of today's global economy.

Key to this growth, however – and vital to the achievement of Sustainable Development Goal (**SDG 8**) – is a workforce equipped with entirely new sets of digital skills.

Governments worldwide are taking measures to address the critical talent shortages created by the rapid pace of technological change.



Among those in the vanguard of such efforts is regional tech leader Singapore, a country that puts heavy emphasis on digital skills education as part of its **Smart Nation** vision.

Seeking to enhance its position as a "**gateway to Asian innovation**," Singapore recently reaffirmed its commitment to spend **SGD 2.4 billion** (USD 1.73 billion) on ICT tenders in the 2017 fiscal year to drive the country's digital transformation and Smart Nation efforts. Moreover, it is expected that there will be 53 000 new ICT professional hires between 2016–2018. But given that some 20 000 ICT vacancies in Singapore went unfilled in 2015, investing in skills development will take on an important role as **Singapore moves forward** in this digital era.

"It's not just a vision, it's about making sure that we continue to be relevant in the global marketplace," Tan Kiat How, Chief Executive, Infocomm Media Development Authority (IMDA), told ITU News in a recent interview. It's about "building the future workforce and making sure that our young and next generation will be relevant in the digital economy."

'Upskilling' and 'reskilling'

In addition to the Lab on Wheels programme (**see article**), in which school children are introduced to technology in a fun environment, the government launched company-based mentorships for graduates to gain hands-on tech skills.

The Company-Led Training programme (CLT) supports the job market by fast-tracking new professionals and upskilling or reskilling experienced professionals to gain skills for technical job roles in demand, such as data analytics.

Private-sector companies co-invest in professionals by providing structured on-the-job training for up to 12 months. This means that companies get access to top talent, while helping to fill the industry pipeline more widely. This structured programme has helped more young people choose technical careers they may not have otherwise chosen.

"Even though a lot of Singaporeans have won the math Olympics internationally, for some reason, it is not a very 'sexy' career option and people may not choose this career path," said Tan Poh Choo, Director of Operations at **SAS Singapore**, a business analytics software and services company, and partner under the CLT programme. "So we thought that if the government has a structured programme and it benefits the industry sector, then I think we should hop onto it."

Spawning homegrown tech innovation

PIXEL Studios is a dedicated facility for content creators and game developers to experiment, collaborate and innovate while growing their skills and platforms.

"We want to help people to not just develop a product, but to develop a viable, sustainable business," says Dr Ng Kian Bee, Deputy Director of the Nanyang Polytechnic School of Interactive and Digital Media, and Lead Facilitator of Pixel Studios. "Then, if your product fails, we know that you have enough know-how to build your business to carry to the next stage."

The business acumen gained from this startup experience is helping transform Singapore's technical talent into a workforce that can drive domestic innovation that will fuel future growth.



ITU/Julie Marchand

Creating entrepreneurs: Malaysia's e-Rezeki programme

"I am proud of what I am doing," says Azhar Ramali with an infectiously warm smile. "I am helping my family, and helping myself, so I am happy."

From a small village in the Borneo islands, over 1000 km from Malaysia's capital, Kuala Lumpur, Ramali, a fisherman's son struggled to find work after completing his degree in Computer Science. But thanks to training he received through Malaysia's e-Rezeki programme, Azhar is now a freelance programmer and presentation specialist for clients around the world. (He earned MYR 50 000 (roughly USD 11 600) during his training alone.)

"Still now, I can't believe it," Azhar said to ITU News. "This is a beautiful programme, I think."

Available at training centers across the country, the e-Rezeki programme aims to help individuals from the bottom 40% of households with monthly incomes below MYR 4000 (roughly USD 950) supplement their income by finding work online. It also helps people with no prior online experience to gain basic digital skills.

It offers three core work streams: digital micro-tasking, such as data extraction or photo moderation; digitally enabled tasks, such as delivery services ordered online; and digital work, such as graphic designers or virtual assistants.

Today, there are 23 000 active users, with 150 000 registered on the platform.

Some people use the additional money they earned as a result of the programme to save for holidays, celebrations or pay household bills, but Ramali had a specific aspiration for his earnings.

"I opened a small mini-market in my village. It has everything you need for fishing and it has food – all owned by my family," he told ITU News. "I am so proud because not only do I give the market, but I provide free Internet to the entire village."

The government aims to have 200 centers running across the country by the end of 2017. ■

Entrepreneurial digital content makers like online video creators and game developers, including **Wah!Banana** and Ratloop Asia (developers of **Rocketbirds 2** for PC and Sony PlayStation 4), have benefitted from PIXEL Studios support and resources.

Malaysia's success

In neighbouring Malaysia, another digital transformation is underway – one focused first on providing better access and basic ICT skills to citizens spread out in rural areas.

Last year, 17.8% of Malaysia's national GDP was derived from the "digital economy", according to government figures, and Malaysia's Prime Minister, Najib Razak, declared 2017 as the year of the Internet economy. However, there remains an urban-rural socioeconomic development divide. As such, driving local ICT-enabled economies is an important goal for the country.

"The vision is to make all Malaysians ICT literate, to make sure at least every Malaysian has basic Internet access and also basic Internet knowledge, so we can come towards a developed nation in 2020. This is one of the steps to become a developed and more advanced nation in 2020," says Norman Razali, Assistant Director, International, Malaysian Communications and Multimedia Commission (MCMC).

Key role of rural Internet centres

Thanks to Internet access and training through government-run rural Internet centres, Malaysia's local entrepreneurs are boosting their online presence and reaping the rewards.

Using the facilities in an Internet centre in the small seaside town of Melaka, entrepreneur Tajul Rusydi Akasyah Bin Abd Aziz, owner of **Tapai Pulut Sarimah**, updates his company Facebook page selling boxes of tapai, a local fermented rice delicacy.

The 26-year-old started coming to the centre in 2016 – and it has helped take the business to the next level. Now new customers from outside the village can enjoy his beloved family recipe.

"This Telecenter helps me to advertise my product on the Internet more frequently, more efficiently. I am currently using Facebook, my webpage, and Instagram," Bin Abd Aziz said. "We increased our revenue by about 20%. It makes me happy."

Training for digital work

Additional training is provided through **Malaysia's e-Rezeki programme** which helps low-income individuals find "side work" to boost their income. Those training centres are located throughout Malaysia to train people in how to find work online. In 2016 alone, 150 000 registered users earned MYR 17 million (close to USD 4 million) through the programme.

Given that a significant portion of today's schoolchildren will be employed in jobs that have yet to be created, new digital skills programs like these will be important to prepare workforces for the future.

The SDGs need a boost.



ICTs can help us do more – **faster**.

Join the #ICT4SDG campaign

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

- Stay current with fresh examples of how tech is boosting the SDGs
- Share your successes globally
- Use our communications tools

ITU

fast forward together
#ICT4SDG

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



BRCK

Homegrown solutions for Africa's digital future

Erik Hersman

Chief Executive Officer of **BRCK**,
Nairobi, Kenya



Industry, innovation and infrastructure should not be imported into the world's emerging economies. Instead, investments should be made into growing sectors, seeding applied research and allowing the local economy to create and grow their own base.

If we're going to solve local problems, then we should also look locally for the solutions, and support them.

> ***"Homegrown technology companies like BRCK, based in Nairobi, provide some of the best solutions to local problems."***
>
> Erik Hersman

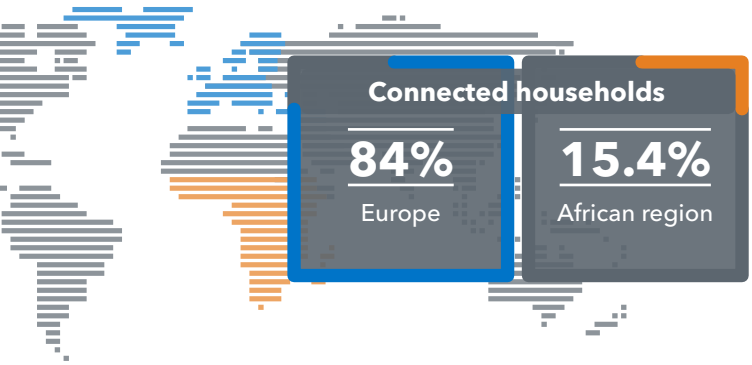


The United Nations' ninth Sustainable Development Goal (**SDG 9**) – to improve industry, innovation, and infrastructure – presents us with one of the most interesting of all the SDG goals, as it is truly a foundational one that undergirds almost all of the other SDGs.

The underlying technologies that support most other verticals are power and connectivity, so if you hope to achieve the SDGs at scale, these two areas require focus.

Not just a technology problem

The numbers are staggering globally. Some 3.9 billion people are still not connected to the Internet, most in emerging markets. We've seen from ITU reports alone that while we see 84% of households connected in Europe, we only have 15.4% in the African region. Almost one quarter of the world's unconnected population sits in Africa. It's a hard problem to solve, because it's not just a technology problem, it's also a business model problem.



McKinsey released a fascinating report on "**digital globalization**" where they show that increasing flows of data and information now generate more economic value than the global trade in goods.

Stop and think about that for a moment.

They're saying that an industry that was practically inexistent 15 years ago can now bring in more value to a country's Gross Domestic Product (GDP) than the centuries-old trade in goods. But while Africa is moving forward – the Internet is more available, and devices for accessing it are getting less expensive – we're still far behind. We're simply not moving fast enough or staying close enough to the rest of the world. And that has profound consequences.

Digital infrastructure brings real economic change

Still, increased access to the Internet is bringing real economic change in Africa. And there is only one investment needed: digital infrastructure. This is the undersea cables, the terrestrial cables, the Internet exchange points, data centers and content distribution points.

Just as regular commerce isn't possible without physical infrastructure like roads, neither is e-commerce possible without digital infrastructure which gives us accessible Internet.

With a faster, cheaper and more reliable Internet, the entrepreneurs amongst us find our buyers and customers, serve them well, grow our business, and create jobs. And that's exactly what's happening in Kenya's growing digital economy – where homegrown technology companies like BRCK, based in Nairobi, provide some of the best solutions to local problems.



BRCK

How BRCK is making a difference

My world at BRCK revolves mostly around connectivity. Our products are used by students in completely off-grid schools, help to track vehicles at airports, and more importantly are getting ordinary Africans connected to the Internet on free public WiFi.

For the last four years, the BRCK team has continued to create some of the most innovative products in Africa, marrying up hardware and software. We do this so well because we live, work and are from Kenya – we know the challenges and opportunities inherent in our country, and can translate the ideas these inspire into products that aren't just used in Kenya – or even Africa. BRCK products are sold as far away as Mexico and the Solomon Islands, as well as 50+ other countries around the world.

The newest device we make is called the SupaBRCK – a small, self-powered router that provides local Internet service, saves content locally, and connects to the Internet using whatever is available, either cable, cell tower or satellite. We set up these devices as a free, local WiFi network to which anyone nearby can connect. It isn't just Internet that people are getting, but locally stored content as well. With the TV shows, music and books stored locally, this means anyone accessing that content via their device gets it quickly and reliably and it costs us nothing to deliver, dramatically improving the economics.

We use this technology in schools, too, in a product called the Kio Kit, which was designed to instantly turn a basic schoolroom into a digital classroom – even in remote, disconnected environments. The Kio Kit consists of 40 rugged tablets, an integrated SupaBRCK server, and digital educational content. By including all of the critical components necessary to effectively introduce technology into the classroom, the Kio Kit solves the challenges of the many failed efforts at designing computers for African schools.

With such an Internet infrastructure, paired with a proper business model, we have a chance to change one of the very basic infrastructure issues on our continent, paving the way for so many other companies to build products and services that make the next 800 million Africans lives better.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



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Q&A



How ICTs can help bridge the rural-urban divide

Dr Shailaja Fennell

Lecturer in Development Studies
Centre of Development Studies and Department of Land Economy, University of Cambridge

How does your academic work link to the United Nations Sustainable Development Goals?

SH – My current research focuses on the importance of linking sustainable solutions for cities and villages. The research agenda proposes the notion of a Smart Village that not only focuses on the means and design for providing access to basic infrastructure such as roads, water, power, education and healthcare facilities, but also focusing critically on the local institutions and networks that can ensure sustainable growth and the development of these villages. Communication and information technologies (ICTs) will play a major role in the design, delivery and monitoring of the services.



Above all, the key to success in creating "Smart Villages" lies in integrated planning which is well supported by robust monitoring and execution of the activities using appropriate governance models. Devising an appropriate Smart Village requires the use of an institutional lens to understand how development can be catalyzed in villages and must focus on both the supply and demand features of the provision of infrastructure, such as ICT service provisions.

How important are ICTs and ICT infrastructure (SDG 9) for progress on the SDGs, especially on rural development and education?

SH – ICT services can be a powerful lever of change for the youth population by generating employment opportunities that can help youth achieve their unmet aspirations in the labour market. This is particularly important in the case of rural households to access education. Where the parental generation has not completed secondary schooling it is difficult for them to successfully identify educational strategies that will ensure social mobility. The achievement of educational and employment aspirations is key to the translation of education outcomes into improving human lives and this can be enhanced by appropriate information that is provided through ICT channels.

A focus on rural areas, and on the aspirations of rural youth can be the beginning of designing innovative interventions to provide the much needed skills to deliver the promise of higher agricultural productivity that is necessary to bring about a diversification of non-agricultural, income-generating activities (e.g. food processing, construction, businesses and services).

For a sustainable transition of the entire economy there needs to be a linkage of networks, both human and technical, between rural and urban areas to sustain growth and to promote the convergence of living standards for all citizens. The mobile phone revolution provides one such powerful lever that can catalyze rural households into Smart Villages that are distinguished by their ability to use new technology to improve education and employment prospects for rural youth. There is a need to work with demand led solutions so that the opportunities provided by ICT technologies are inclusive. The power of digital inclusiveness is that it allows youth to create social media groups and to access new information networks.

Where do you see the most progress in harnessing science, technology and innovation to achieve the SDGs?

SH – The SDGs provide an important opportunity to harness science and technology to design innovative methods for measuring a range of sustainability features – such as measuring groundwater levels, energy efficiency, food security – to name a few – that are crucial to understand the food-water-energy nexus – at the core of human and natural sustainability. The SDGs also provide a powerful push towards multidisciplinary research in the academia and policy circles to develop multi-skilled teams that have the ability to conceptualize and measure the physical challenges as well understand the human impediments to changing behaviour.

Technical interventions are more likely to succeed when they are devised with a rich knowledge of local conditions and an understanding of the needs of different communities.

Where do you see the biggest challenges?

SH – There is still a challenge in getting supply side institutions to understand how the provision of mobile phones and ICTs in rural areas can be a catalyst in rural populations, particularly among youth. Infrastructure providers have regarded urban areas as far more important as they have the finances and the knowledge necessary to access the Internet. In contrast they regard rural communities as being unable to understand and access new technologies.

Consequently, they disregard the potential for youth directed learning to become a powerful conduit for generating new employment opportunities. This results in a complete disregard for developing a model of bottom up governance by which rural communities can improve rural productivity and diversify employment opportunities.

The academic and policy institutions need to develop stronger partnerships with service providers and commercial players to devise more innovative interventions.

“There is still a challenge in getting supply side institutions to understand how the provision of mobile phones and ICTs in rural areas can be a catalyst in rural populations, particularly among youth.”

Dr Shailaja Fennell

There is also a need for the creation of more accessible platforms that allow easily accessible information regarding local solutions that can build on stronger national sustainability initiatives – as in the case of local watershed management that can improve water availability – or locally designed food production networks. The privileging of these linkages has the added advantage of placing the youth population at the centre of the decision-making process, thereby ensuring inter-generational sustainability.



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How ICT infrastructure is crucial to achieving the SDGs in the era of the fourth industrial revolution

LI Yong

Director General of the United Nations Industrial Development Organization (**UNIDO**)



We are currently experiencing the onset of the fourth industrial revolution, which is significantly different from the ones that preceded it. The first industrial revolution was triggered by water and steam, the second industrial revolution was built on electric power, and the third depended on electronics and information technology.

> ***"UNIDO stands ready to work with international fora, governments, and businesses to… realize the potential that Industry 4.0 and ICTs have for the achievement of the SDGs."***
>
> LI Yong

By contrast, the fourth industrial revolution – which is also referred to as Industry 4.0 – is more complex and is characterized by a trend of automation and data exchange in manufacturing technologies. Information and communication technologies (ICTs) are an important driver and are essential for the fourth industrial revolution to be fully realized.

In many developed countries, Industry 4.0 and the use of ICTs are already quite advanced. Companies are applying innovative solutions, for instance through the Internet of Things, cloud computing, miniaturization and 3D printing. These solutions enable better interoperability, more flexible industrial processes, and autonomous and intelligent manufacturing. Further, the physical components of industrial production are being transformed into cyber-physical systems by smart, digital networking, allowing for real-time management of production processes across great distances and products.

Government response

Governments in several more advanced countries have launched medium and long-term strategies to respond to these trends. For example, the German government has institutionalized its commitment to **Industry 4.0** by setting up a platform, which brings together representatives from business, science and trade unions in five working groups. Mexico's Ministry of Economy has also developed a **national roadmap for Industry 4.0**, which outlines opportunities and challenges, and lists steps for action. Similar progress at the policy level can be observed elsewhere, including the **European Commission's Digitising European Industry strategy**, **Russia's National Technology Initiative**, and **Japan's New Robot Strategy**.



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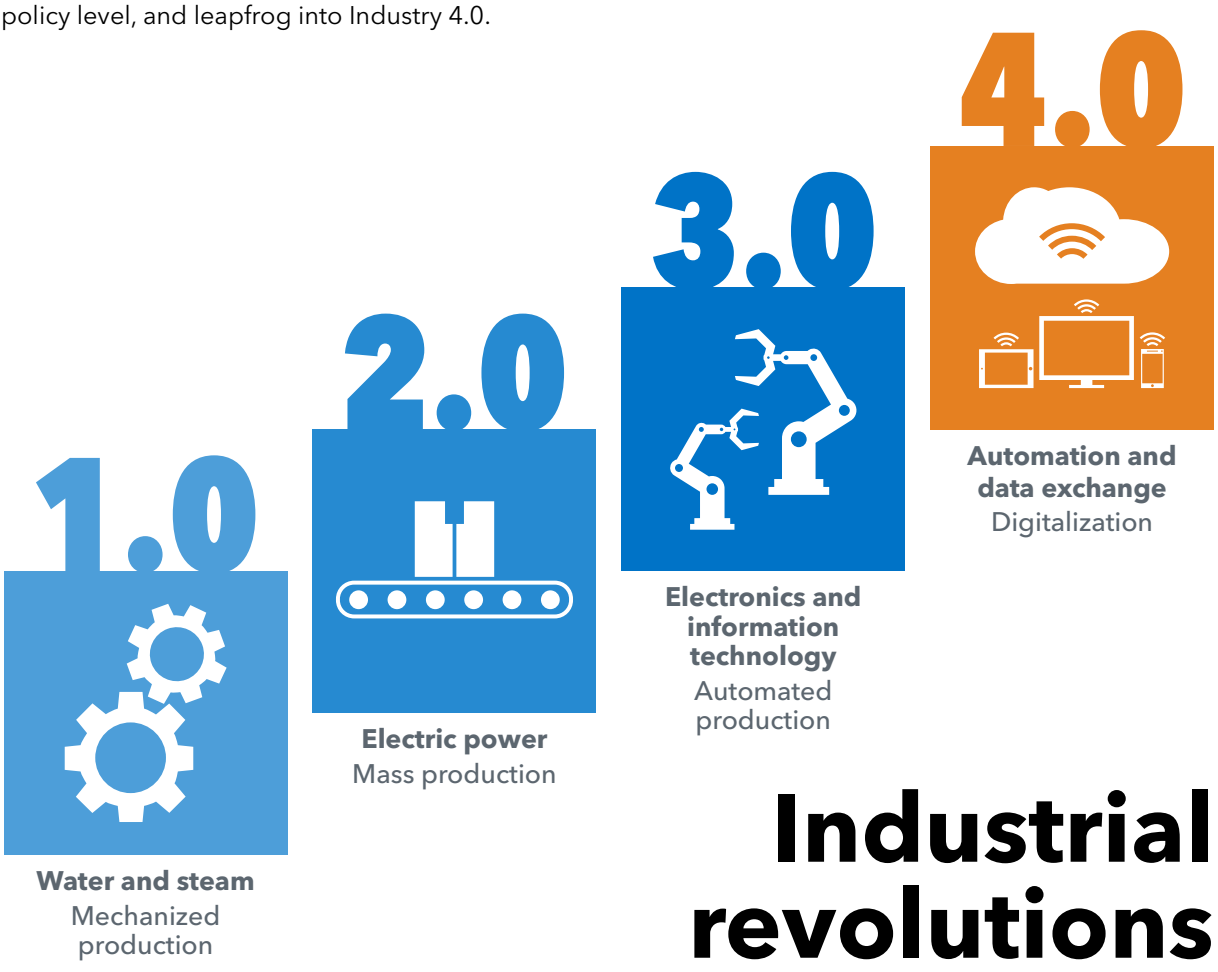
Opportunities for developing countries

The fourth industrial revolution also brings important opportunities for less-advanced developing countries. Improved manufacturing processes can lead to more sustainable production and consumption patterns, thereby contributing to the implementation of the 2030 Agenda for Sustainable Development and the achievement of the Sustainable Development Goals (SDGs). This concerns, in particular, Goal 9 – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation – which is central to our work at the United Nations Industrial Development Organization (UNIDO). Moreover, developing countries can benefit from the experiences of more advanced countries at the business and policy level, and leapfrog into Industry 4.0.

Retrofitting manufacturing equipment provides an opportunity for developing countries to achieve sustainable manufacturing at a low cost.

An important step towards the full implementation of Industry 4.0 is digitalization. Digitalization makes the global flow of information cheaper and easier. Digital technologies can also improve productivity and competitiveness, as well as enhance resource and energy efficiency, thereby creating new business and employment opportunities while protecting the environment.

Digitalization, e-commerce and online marketing can help small and medium-sized enterprises overcome logistical and geographical challenges and improve their access to markets.



Industrial revolutions

The potential impact of digitalization could also contribute to the transition to a circular economy – one in which resources are kept in use for as long as possible through reuse, remanufacturing, and recycling.

Overcoming the challenges of digitalization

It is clear that the integration of digital technologies puts pressure on businesses and governments to adjust business models and regulatory frameworks. Other challenges that need to be faced include a lack of data, inadequate skill sets, a lack of physical and digital infrastructure, and limited connectivity. This is especially true in developing countries and economies in transition.

Several steps need to be taken at the policy and business level in order to respond to these challenges, and boost the kind of inclusive and sustainable industrial activity that leads to higher employment and economic growth.

These include the following:

- Reliable physical and digital infrastructure needs to be made widely accessible. At the moment **3.9 billion people** – which corresponds to slightly more than half of the world population – have no or minimal access to the Internet. The huge digital divide between developed and developing regions needs to be addressed in order to reap the full benefits of Industry 4.0.
- Both small and large enterprises need to find new, creative ways of organizing traditional manufacturing processes. They need to move from a "centralized" to a more "decentralized" production, in which a product might use intelligent machinery to communicate what needs to be done, instead of simply being "processed".
- The ICT infrastructure requires new skill sets, for instance in mechatronics, digital medicine, precision agriculture, robot design, and smart grid design, as well as management. These skill sets cannot be created overnight, and require changes in education and vocational training.
- Businesses and governments need to adapt to a new reality, in which workers collaborate and coexist with machines (co-bots), and in which new industry sectors, such as digital medicine and precision agriculture, emerge.
- Agreement on new standards for the exchange of data pertaining to Industry 4.0 need to be found. These will likely be demanded by consumers and other stakeholders and might be related to the exchange and storage of big data, security and privacy, as well as to ethics guiding the relation between machinery and the work force.

UNIDO stands ready to work with international fora, governments, and businesses to overcome these challenges and realize the potential that Industry 4.0 and ICTs have for the achievement of the SDGs. UNIDO and ITU recently made a commitment to strengthen collaboration in the areas of Industry 4.0, digital transformation and broadband infrastructure, capacity building, and the development of new international ICT standards in order to connect the unconnected, and to enable people worldwide to reap the benefits of the fourth industrial revolution.

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ITU prepares for World Telecommunication Development Conference on ICT4SDGs

ITUWTDC
BUENOS AIRES 2017
9-20 October

This year's World Telecommunication Development Conference (**WTDC-17**) will take place in Argentina from 9 to 20 October under the theme: "ICT for Sustainable Development Goals" – **ICT4SDGs**.

WTDC-17 will set the agenda for telecommunication and information and communication technology (ICT) development over the next four years – the Buenos Aires Action Plan – which will help shape the future of how ICTs contribute to social and economic development.

The Conference is the culmination of six Regional Preparatory Meetings (RPMs) held around the world. All RPMs gave careful consideration to the results of the implementation of the Dubai Action Plan since 2014 and mainly focused their discussions on the priority issues, topics and questions and regional initiatives to be included in the Buenos Aires Action Plan.



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ITU Telecommunication Development Sector (ITU-D)

Regional preparatory meetings for World Telecommunication Development Conference 2017 (WTDC-17)



The Regional Preparatory Meeting for the Commonwealth of Independent States (RPM-CIS), held in Bishkek, Kyrgyz Republic, from 9 to 11 November 2016, resulted in five draft new regional initiatives:

RPM-CIS

- Development of e-health to ensure healthy lives and promote wellbeing for all, at all ages.
- Use of telecommunications/ICTs to ensure inclusive, equitable, quality and safe education, including the enhancement of women's knowledge of ICTs and e-government.
- Development and regulation of infocommunication infrastructure to make cities and human settlements inclusive, safe and resilient.
- Monitoring of the ecological status and of the presence and rational use of natural resources.
- Fostering innovative solutions and partnership for the implementation of Internet-of-Things technologies and their interaction in telecommunication networks, including 4G, IMT-2020 and next-generation networks, in the interests of sustainable development.



The Regional Preparatory Meeting for Africa (RPM-AFR) held in Kigali, Republic of Rwanda, from 6 to 8 December 2016, made proposals to update its existing regional initiatives to include emerging trends and technologies. The proposals focused on the areas and priorities listed below as potential regional initiatives:

RPM-AFR

- Strengthening human and institutional capacity building.
- Strengthening and harmonizing policy and regulatory frameworks.
- Smart and sustainable broadband infrastructure and interconnectivity for equitable access for all in Africa.
- Spectrum management and transition to digital broadcasting.
- Strengthening the security of ICT infrastructure and building confidence in the use of telecommunications/ICT applications.
- Support for ICT-centric innovation clusters in Africa.
- Policy, regulatory and technical support, as well as specialized training programmes for human capacity building in selected flagship initiatives related to Smart Africa.



The Regional Preparatory Meeting for the Arab region (RPM-ARB), held in Khartoum, Sudan, from 30 January to 1 February 2017, resulted in five draft new regional initiatives in the following areas:

RPM-ARB

- Environment, climate change and emergency telecommunications.
- Confidence and security in the use of ICTs.
- Digital financial inclusion.
- Internet of Things, smart cities and big data.
- Innovation and entrepreneurship.



The Regional Preparatory Meeting for the Americas region (RPM-AMS) held in Asunción, Paraguay, from 22 to 24 February 2017, resulted in five draft new regional initiatives:

RPM-AMS

- Disaster risk reduction and management communications.
- Spectrum management and transition to digital broadcasting.
- Deployment of broadband infrastructure, especially in rural and neglected areas, and strengthening of broadband access to services and applications.
- Accessibility and affordability for an inclusive and sustainable Americas region.
- Development of the digital economy, smart cities and communities (SCC) and Internet of Things (IoT), promoting innovation.

> ITU projects: Connecting schools in the Comoros

The **Connect a School Connect a Community in the Comoros** project was implemented by ITU and the Comoros *Autorité Nationale de Régulation des TIC* (ANRTIC) between 2015 and 2016 to promote broadband connectivity in schools in remote and rural areas of the Comoros.

Ten schools were equipped with computers and training programmes were provided to school children, teachers, as well as to members of the local community.

The connected schools became knowledge centres for the local community, including disadvantaged and vulnerable groups such as women and girls and persons with disabilities who could use the knowledge to improve their socio-economic well-being.

"We anticipate that the community in the area will come in large numbers to use the computers," said Mohamed Omar, Director of one of the centres. "Through Internet connectivity they can access information. This project will also help create employment opportunities."

"This ICT project was received well by the local community and they are satisfied with its outcome as they never had the opportunity before. It has made it possible to train teachers who will in turn teach the students and other members of the community," said Asmina Said Ahmed, Head of the Project Management Department at ANRTIC. <



The Regional Preparatory Meeting for Asia and the Pacific (RPM-ASP) held in Bali, Indonesia, from 21 to 23 March 2017, resulted in five draft regional initiatives:

RPM-ASP

- Addressing special needs of least developed countries, small island developing states, including Pacific island countries, and landlocked developing countries.
- Harnessing ICTs to support the digital economy and an inclusive digital society.
- Fostering development of infrastructure to enhance digital connectivity.
- Enabling policy and regulatory environments.
- Contributing to secure and resilient environment.



The Regional Preparatory Meeting for Europe (RPM-EUR), held in Vilnius, Lithuania, from 27 to 28 April 2017 resulted in five draft regional initiatives:

RPM-EUR

- Broadband infrastructure, broadcasting and spectrum management.
- A citizen-centric approach to building services for national administrations.
- Accessibility, affordability and skills development for all to ensure digital inclusion and sustainable development.
- Enhancing trust and confidence in the use of ICTs.
- ICT-centric innovation ecosystems.

> ITU projects: Thailand's Internet centres

ITU and the National Broadcasting and Telecommunications Commission (NBTC) of Thailand have established more than 20 rural Internet centres nationwide. The centres strengthen ICT skills among students, youth and local communities, thereby promoting social and economic development. They are run by a group of volunteers known as **NBTC-ITU Volunteers**.

"The computer and the Internet are very important for students", says Pornchai Nachaiwiang, Principal of Ban Pang Kae School in Nan, northern Thailand. "Students have also been able to transfer the computer and Internet knowledge they have gained back to their families and communities and some are now able to use e-commerce platforms to buy and sell products."

Boonyuen Pittayakannurut, a resident of the northern city of Chiang Mai, has also benefitted from better Internet access. "I have been able to research on how to protect my family against Dengue fever," he says. "I have also shared the information I gathered with my neighbours and friends, many of whom did not know what measures to take against the disease."

"Working with young children and adults, helping them navigate the world of computers and the Internet has been a great and a very memorable experience for me," says Chanoksuda Wongvises, one of the NBTC-ITU Volunteers. <

Video insights

Connecting schools in the Comoros



Thailand's Internet centres



25th Anniversary of the ITU Telecommunication Development Sector

This year the ITU Telecommunication Development Sector (ITU-D) celebrates its 25th Anniversary.

ITU-D 1992 2017

CELEBRATING 25 YEARS OF ACHIEVEMENTS

ITU-D was established in 1992 by the Additional Plenipotentiary Conference held in Geneva, Switzerland, and over the past 25 years the Sector has contributed immensely to the rapid growth and global expansion of telecommunication/ ICT networks and services – helping improve citizens' access to government services, health care, education, agricultural services, financial and banking services, and market information.

A Ministerial Roundtable and a Gala Dinner will be held at WTDC-17 on 11 October to mark the Anniversary of ITU-D.

Read more about the 25th Anniversary.

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