



ICT For Sustainable Urban Development

- Converged Telecommunications Policy And Regulations Master Class
- Making A Better Internet For Children
- Content And Applications For Smart Communities
- The Impossible Green Data Centre
- Hybrid Power Systems For Remote Telecommunication
- The End Of An Era For Print Newspapers?
- RTM: 70 Years Together With The Nation
- Address For All - Enabling Ecommerce Fulfilment To Everyone
- Communications Device Certification
- Fixing The E-Waste Problem
- Income Tax E-Filing, A Digital Services Case Study





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From the Chairman's Desk

It is my great pleasure to extend greetings to readers of .myConvergence.

MCMC is once again at the forefront of initiatives and programmes that will take our nation to new heights of development. Since the millenium, in tandem with the world, the lives of people have been transformed through the advances brought about by the convergence of communications and multimedia. The next big trends are the Internet of Things and smart lifestyles and services.

The future is certainly bright but these technological advances come with their own challenges and perils. Among others, the world has to deal with global warming; mountains of waste generated by the ICT industry; and an over dependence on fossil fuels. The key to a prosperous future world will be solutions and technologies that are sustainable and kind on the world's resources.

MCMC is pleased to support initiatives and programmes that seek to solve these perplexing problems. This issue of .myConvergence highlights some of them. This issue's cover story examines how ICT can help in sustainable urban development. In a few years from now, the majority of the world's population will live in cities and urban planners have a unique opportunity to create cities that are smart and sustainable.

The story of a remarkable Malaysian venture that has built the 'impossible green data centre' is to be found in this issue. Another equally interesting article is about a hybrid power system for remote base stations that has no carbon footprint.

As the communications and multimedia world grows in complexity, so too do the related policy and regulatory challenges for the telecoms and ICT sectors. MCMC is working to bring telecoms professionals up to speed with regulatory policies. Together with our academic and global industry partners we have put together a Converged Telecommunications Policy and Regulations Master Class. The first master class has taken place and the feedback from participants has been very encouraging.

Thank you

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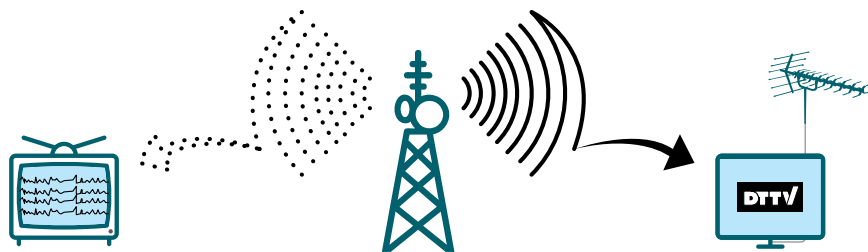
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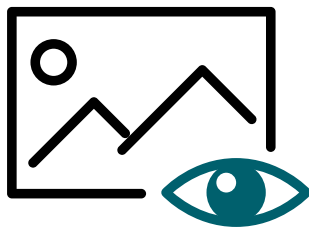
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ICT For Sustainable Urban Development

ICT coupled with careful planning and management of urban areas can alleviate global poverty, increase socioeconomic prosperity and enhance human wellbeing.

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The World Cities Report (WCR) 2016 'Urbanization and Development: Emerging Futures'¹, estimated that currently, 54% of the Earth's 7.6 billion population reside in cities. And the pace of urbanisation is increasing exponentially. It is expected that by 2050 this number will increase to 70% due to rapid urbanising trends.

The main advantage of urbanisation is that it fosters growth, and is generally associated with greater productivity, opportunities and quality of life for all. People flock to the cities since it harnesses the human and technological resources that result in improved productivity, societal development, innovation and economic growth. The WCR reported that the top 600 cities, with a fifth of the world's population, produce 60 percent of global gross domestic product (GDP).

While it is generally acknowledged that urbanisation has the potential to accelerate

the socioeconomic growth of countries, cities often also become sites of poverty, inequality and environmental degradation due to the rapid, unplanned and unmanaged nature of urbanisation. The reason for this is that many cities around the world are grossly unprepared for the multi-dimensional challenges, as shown in Figure 1, that are associated with urbanisation.

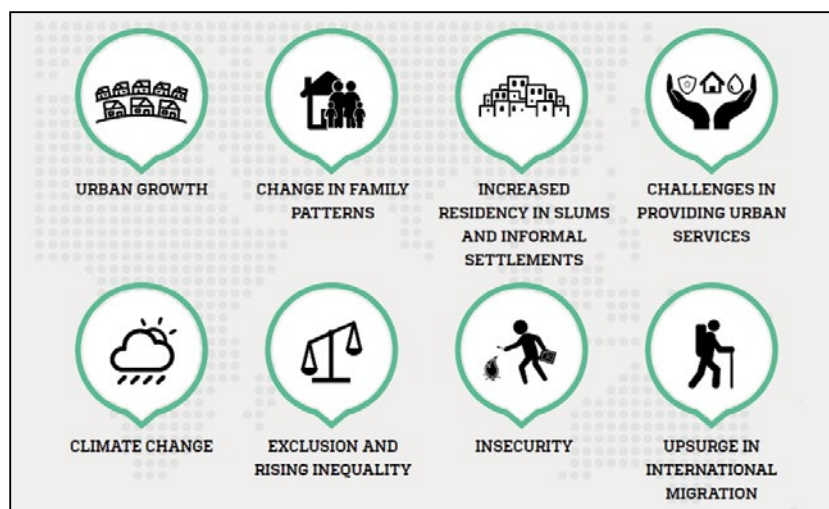


Figure 1: Persistent issues and emerging urban challenges due to increased urban population
Source: World Cities Report 2016 'Urbanisation and Development: Emerging Futures', UN-Habitat

¹ World Cities Report 2016 'Urbanization and Development: Emerging Futures', UN-Habitat

International organisations, such as United Nation (UN) and World Health Organisation (WHO), have agreed that realising the potential of cities and managing its challenges will require the adoption of a multi-sectorial, multi-stakeholder and multi-level approach to sustainable urban development. Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs, and it has been a focus of international public policy since the Earth Summit in 1992.

The key enabler for sustainable development is information and communication technologies (ICTs). Integration of ICTs into cities' major processes can make it smarter and more efficient. For example, ICTs can reduce administration costs and improve access to key areas such as healthcare, education and banking as well as providing a platform for inclusion.

The Chairman of the International Telecommunication Union (ITU) Focus Group on Smart Sustainable Cities, Silvia Guzman, emphasised this point when she stated that "Amidst the challenges posed by rapid urbanisation, decision-makers are facing the need to rethink and redefine the way in which infrastructure is built, services are offered, citizens are engaged, and systems linked, with the aim of transforming cities into more sustainable and robust living environments. ICT-enabled innovation is at the core of that transformation"².

This article explored the relationship between urbanisation, sustainability and ICT. We analysed what are the smart, sustainable development plan in Malaysia, what are the challenges faced by our urban areas, why we need a global initiative to drive continuous growth in cities and how ICTs along with digital inclusion can become the mechanisms for sustainability. Finally, we elaborated on Malaysian Communications and Multimedia Commission (MCMC) efforts in supporting smart, sustainable development.

SMART SUSTAINABLE DEVELOPMENT IN ELEVENTH MALAYSIA PLAN

Malaysia through its Eleventh Malaysia Plan has set in motion initiatives and actions to achieve smart, sustainable development. Speaking at the United Nation General Assembly in New York on 24 September 2016, Deputy Prime Minister Datuk Seri Dr Ahmad Zahid Hamidi, stated "Our current five-year development plan, the Eleventh Malaysia Plan covering the period of 2016 - 2020, was formulated with people at the centre of all development efforts and with the theme, 'anchoring growth on people'. The Plan embraces three main principles - achieving high income, inclusiveness,

and sustainability. In many aspects, the Plan mirrors the multi-dimensional nature of the Sustainable Development Goals (SDGs)."

The plan for sustainability was detailed out in the Strategy Paper 11³ which comes under Strategic Thrust IV: Pursuing Green Growth for Sustainability and Resilience. It was stated that the plan will focus on strengthening the nation's resilience against climate change impact and natural disasters while at the same time ensuring that economic growth is decoupled from high resource use and environmental degradation.

Furthermore, Malaysia has always been a proponent of utilising ICT to achieve sustainable development. Our effort was recognised by the ITU when the Prime Minister, Dato' Sri Mohd. Najib Tun Abdul Razak, on behalf of the Malaysian government received the 'ICT in Sustainable Development Awards 2015' on 27 September 2015. In his acceptance speech the Prime Minister highlighted the importance of digital inclusion in the people-centric Eleventh Malaysia Plan. He further added, "We believe that our nation will prosper through innovation and ICT to create a smart digital nation".

The government's ICT development efforts were to ensure underserved communities will ultimately have equal opportunities in a developed Malaysia. This was outlined in Strategy Paper 15⁴ under Strategic Thrust V: Strengthening Infrastructure to Support Economic Expansion. This paper focuses on ICT as an 'imperative enabler for a knowledge economy, especially in the areas of industry, infrastructure, human capital and digital inclusion. These enablers will increase productivity through innovation, thereby enhancing competitiveness and wealth creation'.

URBAN CHALLENGES IN MALAYSIA

The strategies that were laid out in the Eleventh Malaysia Plan are intended, among others, to combat the challenges of urbanisation including the growing number of urban residents living in informal settlements, upsurge in international migration and climate change.

One of the persistent issues plaguing city managers is the widespread growth of slums or informal urban settlements, particularly in the developing world. According to UN-Habitat, slum is a contiguous settlement that lacks one or more of the following five conditions: access to clean water, access to improved sanitation, sufficient living area that is not overcrowded, durable housing and secure tenure.

The UN-Habitat reported that slums are the products of failed policies, poor governance, corruption, inappropriate regulation, dysfunctional land markets, unresponsive financial systems, and a lack of political will. Locally, those living in these settlements were

² Smart sustainable cities, ITU News, No. 4 2014

³ Strategy Paper 11: Climate Resilient Development, Eleventh Malaysia Plan

⁴ Strategy Paper 15: Driving ICT in the Knowledge Economy, Eleventh Malaysia Plan

known by a variety of terms that have a negative connotation such as slum-dwellers, informal settlers, squatters, maskwota (in East Africa) paracaidistas or colonos (in Mexico), okupas (Spain, Chile and Argentina), favelados (in Brazil) and 'setinggan' (Malaysia) shown in Figure 2.



Figure 2: Setinggan area in Kuala Lumpur
Source: Astro Awani

Even a metropolitan city like Kuala Lumpur cannot escape the drudgeries of the slum area. A news article⁵ reported that setinggan is seen as an unsavoury location at the centre of the criminal community in the city. These squatter settlements are also said to pollute the surrounding urban area and are often associated with poverty, discomfort, overcrowding, filth and lack of basic facilities.

The challenge of informal settlements in cities is further exacerbated by the arrival of refugees or migrants. The world witnessed conflicts, violence and human rights violations that resulted in the upsurge of involuntary migration, either within or outside their home countries in the past few years. There are also economic migrants who leave their country in search of a better life. This is an emerging issue which has implications on cities.

Malaysia has received its share of economic migrant that are mostly employed in the manufacturing, agriculture and construction sectors (Figure 3). The Ministry of Home Affairs stated that according to Immigration Department statistics, there are 2.08 million foreign workers holding valid temporary work visa and are still active in the country up until January 2016⁶. The unofficial number could be as high as

7 million⁷. Most of these workers reside in urban areas and their presence needs to be considered by city officials as well.

Climate change is another emerging challenge for cities. While cities are the world's foremost socio-economic centres, the human activities that generate the majority of global GDP come at a price. Cities emit significant and growing amounts of greenhouse gases. Fifth Assessment Report estimated that, in 2000, urban areas with populations of greater than 50,000 accounted for 37-49 percent of global greenhouse gas emissions and as much as 71-76 percent of energy related CO₂ emissions. And this is growing at an alarming rate. Between 1950 and 2005, the level of urbanisation increased from 29% to 49%, while global carbon emissions from fossil-fuel burning increased by almost 500%⁸.

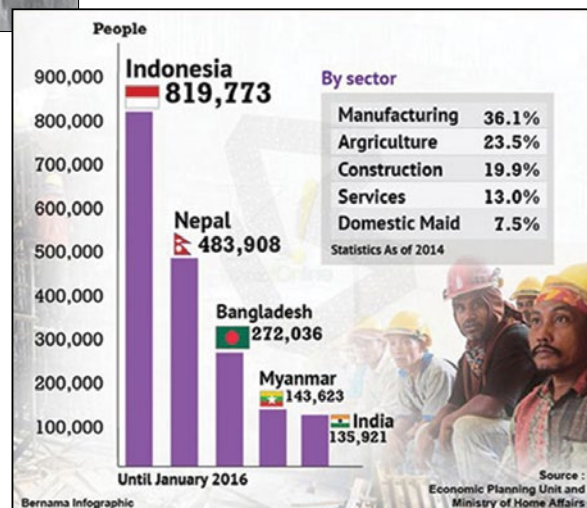


Figure 3: Number of foreign workers in Malaysia
Source: Bernama Infographic

In urban areas, climate change impacts like heat waves, heavy precipitations and droughts can compound one another, making disaster risk management more complex. Malaysian have experienced this phenomena themselves. We are accustomed to flash floods in the major cities like Kuala Lumpur, Penang and Johor Bahru, seasonal floods in Kuantan and Kota Bharu as well as haze throughout the country (Figure 4).



Figure 4: Flood and haze in Malaysia

⁵ Hari Wilayah Persekutuan: KL dari kaca mata anak setinggan, Astro Awani, 1 February 2016

⁶ Pekerja asing berdaftar 2.08 juta, Kosmo 21 March 2016

⁷ 7 juta pekerja asing di Malaysia, Utusan Online 29 Jun 2015

⁸ An Urbanising World: Global Report on Human Settlements 1996, UN-Habitat

Due to these factors, it is crucial to recognise that cities must also be part of the solution to climate change. Through proper planning and design, urbanisation offers many opportunities to develop mitigation and adaptation strategies to deal with climate change.

The 2011 Global Report on Human Settlements⁹ stated that "... linking climate change responses with urban development offer abundant opportunities, but they call for new philosophies about how to think about the future and how to connect different roles of the different levels of government and different parts of the urban community."

THE NEED FOR SUSTAINABLE DEVELOPMENT

Despite the challenges of city living, the majority of the world's citizen, Malaysian included, still depend on the opportunities which urban centres provide. With this in mind, the world is presented with a huge opportunity to get urbanisation right since more than 60% of the total area expected to be cities in 2030 is not yet built¹⁰. Careful planning and management of urban areas can alleviate global poverty, increase socioeconomic prosperity and enhance human wellbeing.

United Nations Secretary-General Ban Ki-moon said "Cities are engines of dynamism and creativity. In many respects, cities are the proving ground for our efforts to combat climate change, build resilience and achieve faster, more equitable development progress."

Fortunately, several organisations around the world are embarking on global processes to promote sustainable urban development. These include the formulation of the 2030 Agenda for Sustainable Development, Habitat III: New Urban Agenda and the United for Smart Sustainable Cities (U4SSC) as illustrated in Figure 5.



Figure 5: Global processes for sustainable urban development

The 2030 Agenda for Sustainable Development¹¹ was adopted by world leaders at the United Nations Sustainable Development Summit 2015 in September 2015, in New York. Through this agenda, the world leaders are committed to achieving a balanced and integrated sustainable development in its three dimensions; economic, social and environmental.

The Agenda is a plan of action for people, planet, prosperity, peace and partnership over the next fifteen years which includes 17 Sustainable Development Goals (SDGs) (Figure 6) and 169 targets. The SDGs build upon the achievements of the Millennium Development Goals (MDGs) and seek to address their unfinished business.

ICTs are increasingly recognised as an integral part of the SDG process. The 2030 Agenda notes that "The spread of ICT and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies."



Figure 6: The Sustainable Development Goals Source: Transforming our World_The 2030 Agenda for Sustainable Development 2015, UN

9 Cities and Climate Change: Global Report on Human Settlements 2011, UN-Habitat

10 Information and Communication Technology for Urban Climate Action 2015, UN-Habitat, Ericsson and ITU

11 Transforming our World: The 2030 Agenda for Sustainable Development 2015, UN

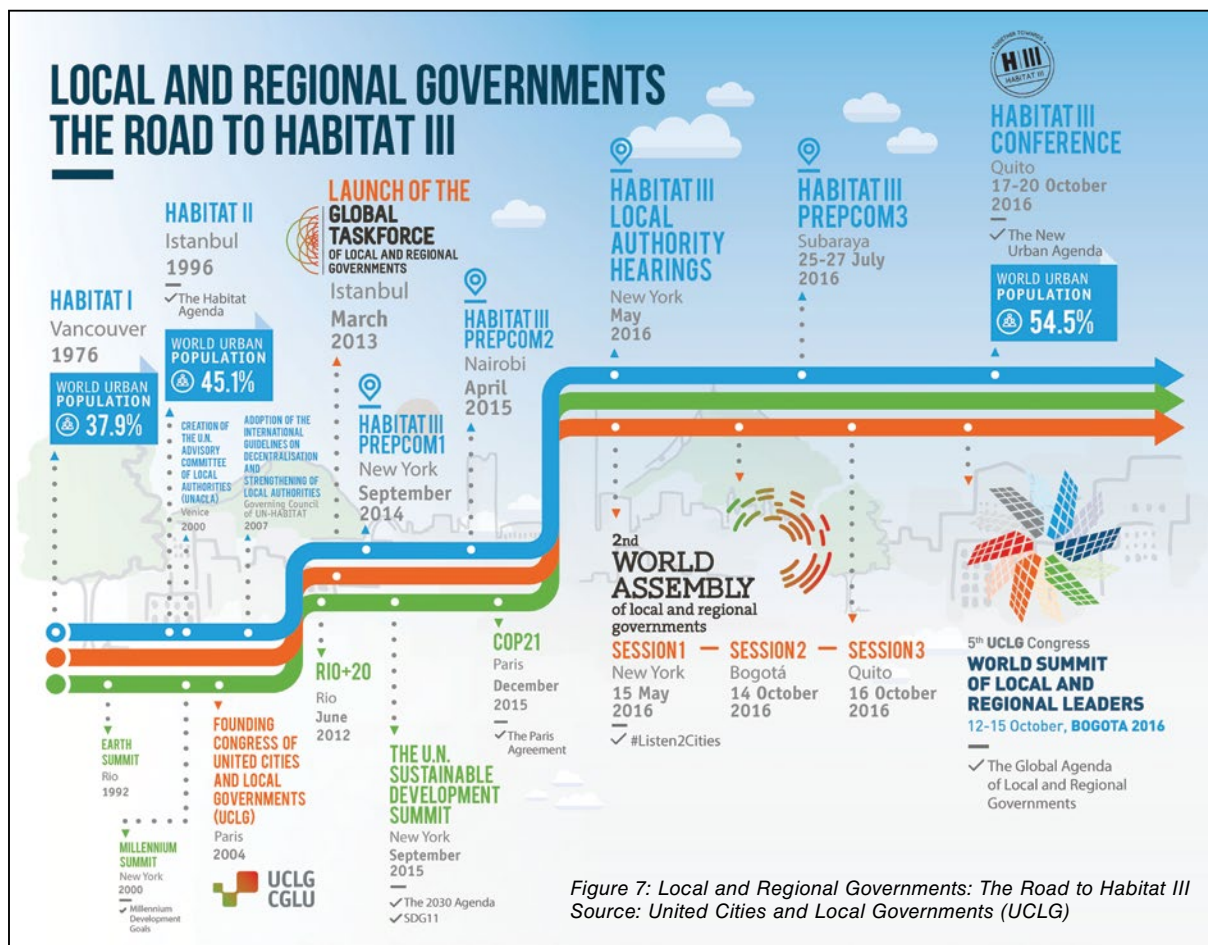


Figure 7: Local and Regional Governments: The Road to Habitat III
Source: United Cities and Local Governments (UCLG)

Another notable global process is the Habitat III, the United Nations Conference on Housing and Sustainable Urban Development that took place in Quito, Ecuador in October 2016. It aims to reinvigorate the global commitment to sustainable urbanisation by focusing on the implementation of a ‘New Urban Agenda’¹². It was built upon the Habitat Agenda agreed at the Habitat II conference in 1996. The roadmap and coordination for collective effort between 2030 Agenda and Habitat III can be seen in Figure 7.

UN Under-Secretary-General and UN-Habitat Executive Director, Dr Joan Clos, stated that “A New Urban Agenda is required to effectively address the challenges and take advantage of the opportunities offered by urbanisation.”

Habitat III will be the first UN global summit after the adoption of the 2030 Agenda for Sustainable Development. Dr Clos also mentioned that Habitat III and the New Urban Agenda should establish critical connections to the 2030 Agenda for Sustainable Development and other international agreements. There is a need to ensure a strong convergence among these agendas as a way of complementing and improving the implementation of the SDGs, particularly those with an urban component.

The New Urban Agenda will offer a framework of how cities, towns and villages are imagined, planned and managed, to fulfil their role as drivers of sustainable development. The framework would also include the integration of ICTs in cities to act as a transformative force that can develop and manage urban centres.

The third global process to promote sustainable urban development is the United for Smart Sustainable Cities (U4SSC) Initiative. The ITU and the United Nations Economic Commission for Europe (UNECE) along with other 16 United Nations agencies have created U4SSC to advocate for public policies that can facilitate the integration of ICTs for smart sustainable city transitions¹³. The global initiative was launched at the ITU-UNECE Forum on ‘Shaping smarter and more sustainable cities: striving for sustainable development goals’ in Rome, Italy, in May 2016.

In opening the Forum, ITU Deputy Secretary-General Malcolm Johnson pointed out “Smart sustainable cities benefit from improved energy efficiency, reduced environmental pollution, increased social inclusion, and offer businesses a better return on investment, and people a happier and healthier environment in which to live.”

12 Habitat III Conference: The New Urban Agenda 2016, UN

13 United for Smart Sustainable Cities (U4SSC) Flipbook 2016, ITU and UNECE

U4SSC was formulated as the response to United Nation’s SDG 11. It will also assist in advancing the global smart city movement of the New Urban Agenda that was launched during Habitat III Conference. The pillars of SSC development under U4SSC are illustrated in Figure 8.



Figure 8: U4SSC Pillars
Source: United for Smart Sustainable Cities (U4SSC), ITU

Real-time data monitoring that utilises ICT can provide city managers with relevant and up-to-date intelligence enabling them to make more informed decisions on the management of city services such as roads, public transportation systems, electricity, water management and disaster preparedness. There are also ICT applications that explore solutions concerning air quality and electromagnetic fields monitoring, increasing energy efficiency as well as providing better education and health services as depicted in Figure 10.

“A smart sustainable city is an innovative city that uses ICTs and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects.”

Figure 9: Definition of Smart Sustainable City
Source: ITU-T Focus Group on Smart Sustainable City

ICT AS THE ENABLER FOR SUSTAINABLE URBAN DEVELOPMENT

Based on the reports from the aforementioned global processes, it was universally agreed that the solution to tackle urban challenges lies in making cities ‘smarter’ and more sustainable at the same time. Hence, our national Eleventh Malaysia Plan is in line with the international direction.

ITU in collaboration with the UNECE has led to the international agreement of a definition of smart, sustainable cities (SSC) shown in Figure 9. Having a formal, comprehensive definition for the SSC provides a basis for understanding the common features of SSC and developing key indicators. This helps establish an ICT infrastructure, metrics and policies for SSC.

ICTs through their capacity to gather, process, analyse and disseminate considerable amount of data are a key enabler for sustainable urban development¹⁴. ICTs can provide valuable and efficient solutions in different sectors of modern cities. Although the role of ICT has not been completely framed, the services where ICT can assist are well recognised.



Figure 10: The city of the future
Source: Delivering Next-Generation Citizen Services, Cisco

14 How Information and Communications Technology can Accelerate Action on the Sustainable Development Goals (ICT & SDG Final Report) 2016, The Earth Institute and Ericsson

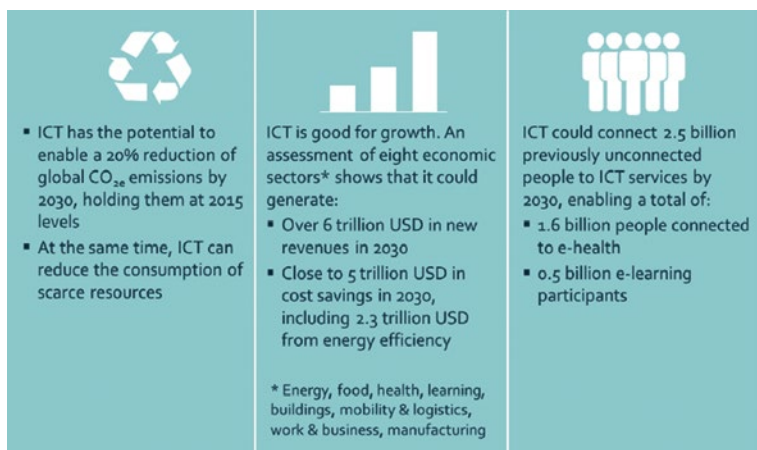


Figure 11: #SMARTer2030 main findings
Source: #SMARTer2030: ICT Solutions for 21st Century Challenges 2015, GeSI

Usage of ICT in other sectors can also facilitate that sector to be more environmentally friendly. According to Global e-Sustainability Initiative (GeSI) in their #SMARTer2030 report¹⁵, ICT can decrease global carbon emissions, stimulate economic growth and deliver benefits to society as shown in Figure 11. The report also highlighted that as ICT become faster, cheaper and more accessible globally, its potential to generate powerful environmental, economic and social benefits is beyond what GeSI envisioned. “Our findings show an ICT-enabled world that is cleaner, healthier and more prosperous, with greater opportunities for individuals everywhere.”

Furthermore, #SMARTer2030 research indicated that ICT sector’s emissions ‘footprint’ is expected to decrease to 1.97% of global emissions by 2030, compared to 2.3% in 2020. On top of that, their modelling shows that by 2030, the 12Gt CO_{2e} avoided through the use of ICT solutions is nearly ten times greater than the emissions generated by deploying it (Figure 12). This is significant proof that ICT can be an enabler for sustainable development.

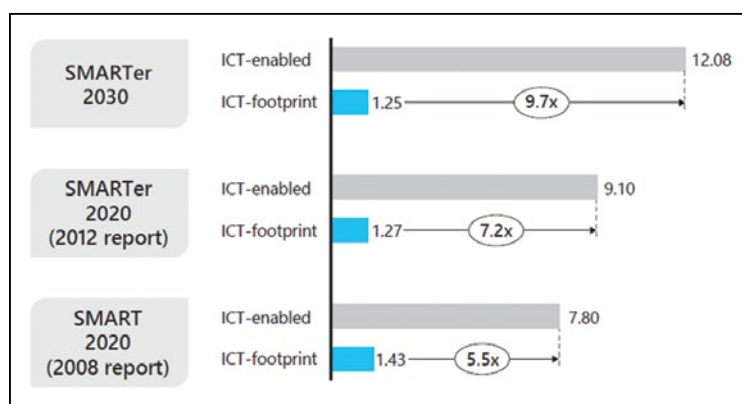


Figure 12: ICT benefits factor in 2020 and 2030 (Gt CO_{2e})
Source: #SMARTer2030: ICT Solutions for 21st Century Challenges 2015, GeSI

ICT underlying technologies, including mobile broadband, Internet of Things (IoT), advanced robotics, artificial intelligence, big data and cloud computing, will be the essential infrastructure platform for implementing the SDGs. They have the potential to drive disruptive and transformative changes across every sector of society.

The most notable driver for ICT application is mobile broadband. According to Measuring the Information Society Report (MISR) 2015¹⁶, there have been a substantial growth in global access to and use of ICTs, particularly where mobile services and the Internet

are concerned. Mobile cellular networks now cover over 95 percent of the world’s global population, while the number of mobile-cellular subscriptions has risen from 2.2 billion in 2005 to an estimated 7.1 billion in 2015.

There is also noticeable growth in the number of mobile broadband subscriptions worldwide, from 0.8 billion in 2010 to an estimated 3.5 billion in 2015. However, the number of fixed-broadband subscriptions has risen much more slowly to an estimated 0.8 billion today. The number of Internet users has also grown rapidly, and is now estimated at over 40% of the world’s population (Figure 13).

Access to broadband and mobile broadband support the provision of basic needs such as education and healthcare, helping to lift people out of poverty through e-commerce and job growth, monitoring climate change and planetary processes, and bridging the digital gender divide. These are indications that broadband connection is vital to achieving the SDGs¹⁷.

IoT is another technology that will evolve the role of ICTs in the SDG era (2016 - 2030). The ITU has defined the IoT as “a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies”¹⁸

Houlin Zhao, ITU Secretary-General stated that “The Internet of Things is not a single, unified network of connected devices, but rather a set of different technologies which can be put to work in coordination together at the service and to the ultimate benefit of people in both developed and developing economies. This set of Internet of Things technologies is realising a vision of a miniaturised,

15 #SMARTer2030: ICT Solutions for 21st Century Challenges 2015, GeSI

16 Measuring the Information Society Report 2015, ITU

17 The State of Broadband 2016: Broadband Catalyzing Sustainable Development, UN Broadband Commission

18 Recommendation ITU-T Y.2060, ITU

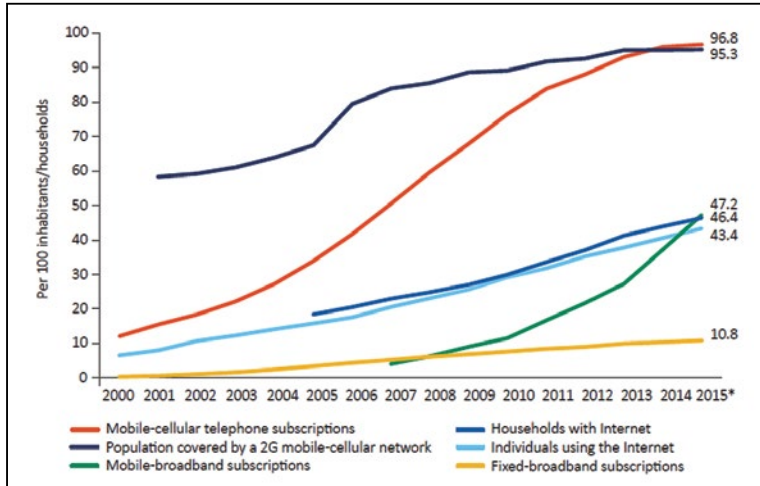


Figure 13: Global changes in major ICTs, 2000-2015
Source: *Measuring the Information Society Report 2015, IT*

embedded, automated environment of devices communicating constantly and automatically”.¹⁹

Ericsson indicated that there are already 230 million cellular Machine-to-Machine subscriptions for IoT applications, and it projects up to 26 billion connected devices by 2020. The applications are far more diverse than for people-to-people connections. Major functions of IoT include anomaly detection and control of complex equipment and integrated systems, systems optimisation, prediction, data capture and analytics, systems maintenance and many other functions.

It was also reported by Cisco that “Every hour 300,000 new things connect to the Internet; translating into more than 50 million things a week. And this rate of connectivity is increasing. We estimate that by 2020,²⁰ 50 billion things and five billion people will be connected (Figure 14).”²¹

Cisco’s CEO, Chuck Robbins, said that even though they are in the early stages of IoT adoption, IoT is already making a great impact for people, companies,

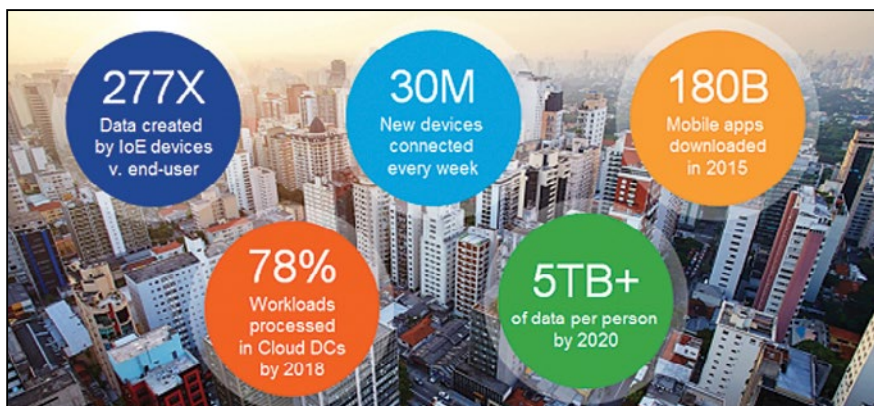


Figure 14: The exponential rise in connectivity
Source: *50 Billion Things, Coming to a Cloud near You, Cisco Blogs*

industries and countries around the world. He further added that the application of the IoT to solve many of the world’s challenges is limited only by our imagination.

DIGITAL INCLUSION SUPPORTS SUSTAINABLE DEVELOPMENT

It is important to note that for a comprehensive sustainable urban development to take place and to ensure that ICTs make a significant impact in cities, ICTs must be accessible to the entire population. However,

availability does not necessarily mean accessibility. Even though ICT products and services may be available in a city, it may not be practically accessible to all segments of the population. In many cases this is due to a lack of affordability, training and education.

MISR 2015 stated that the differences in fixed and mobile telephone as well as broadband penetration rates between countries in different development groupings continue to be substantial (Figure 15). Developing countries still lag behind developed countries in access to ICTs, and least developed countries are particularly disadvantaged. These differences highlight the digital divides in access to high-speed, high-capacity broadband. In addition, inequalities are accentuated by differences in the speed of available fixed broadband connections. If not properly addressed, the digital divide risks aggravating inequalities that will hinder achievement of the SDGs.

In recognising the need to monitor, address and overcome the digital divide, the 2014 ITU Plenipotentiary Conference (PP-14) in Busan adopted the Connect 2020 Agenda²². Through the Connect 2020 Agenda ITU Member States are committed to work towards the shared vision of “an information society, empowered by the interconnected world, where telecommunication/ ICT enables and accelerates socially, economically and environmentally sustainable growth and development for everyone” and invited all stakeholders to contribute

¹⁹ *Harnessing the Internet of Things for Global Development 2016, ITU and Cisco*

²⁰ *Ericsson Mobility Report June 2015, Ericsson*

²¹ *50 Billion Things, Coming to a Cloud near You, June 10 2015, Cisco Blogs*

²² *Connect 2020: Setting a Global Agenda for the ICT Sector 2014, ITU*

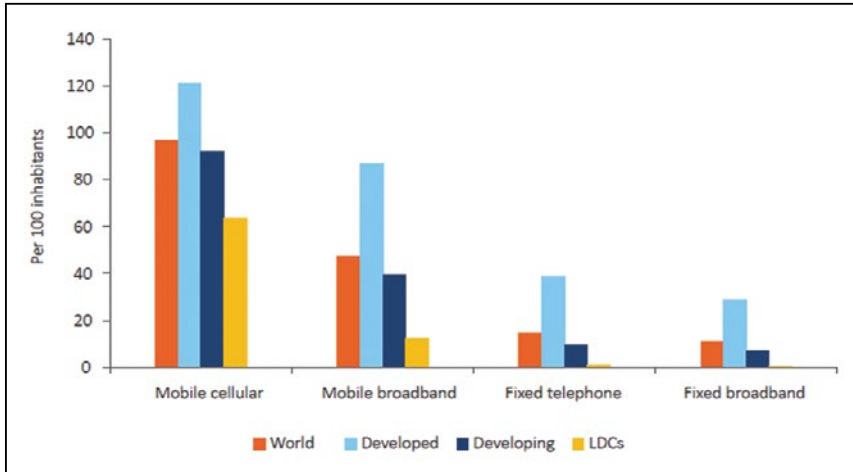


Figure 15: ICT access by development status, 2015
Source: Measuring the Information Society Report 2015, ITU

with their initiatives and their experience, qualifications and expertise to the successful implementation of the Connect 2020 Agenda.

Connect 2020 includes four goals, with seventeen targets, to monitor and stimulate the development of the ICT sector between 2015 and 2020 (Figure 16). These goals and targets have been elaborated through a process that lasted for more than a year and included

wide participation of key stakeholders such as vendors telecommunication/ICT equipment, telecom operators, international, regional and national associations and organisations and public administrations.

Through the Connect 2020 initiatives, it is expected that the number of ICT users will increase by a further 1.5 billion by the year 2020, thus ensuring that more people and communities benefit from inclusion in the digital economy. ITU Secretary-General, Houlin

Zhao, mentioned that to promote the beneficial use of ICTs and minimise the potential negative impacts, ITU needs to manage challenges that emerge from ICT's rapid growth²³. He also notes that "We must strengthen cybersecurity, preventing potential harm to the most vulnerable parts of society, in particular children, and mitigating the negative effects on the environment, including e-waste."

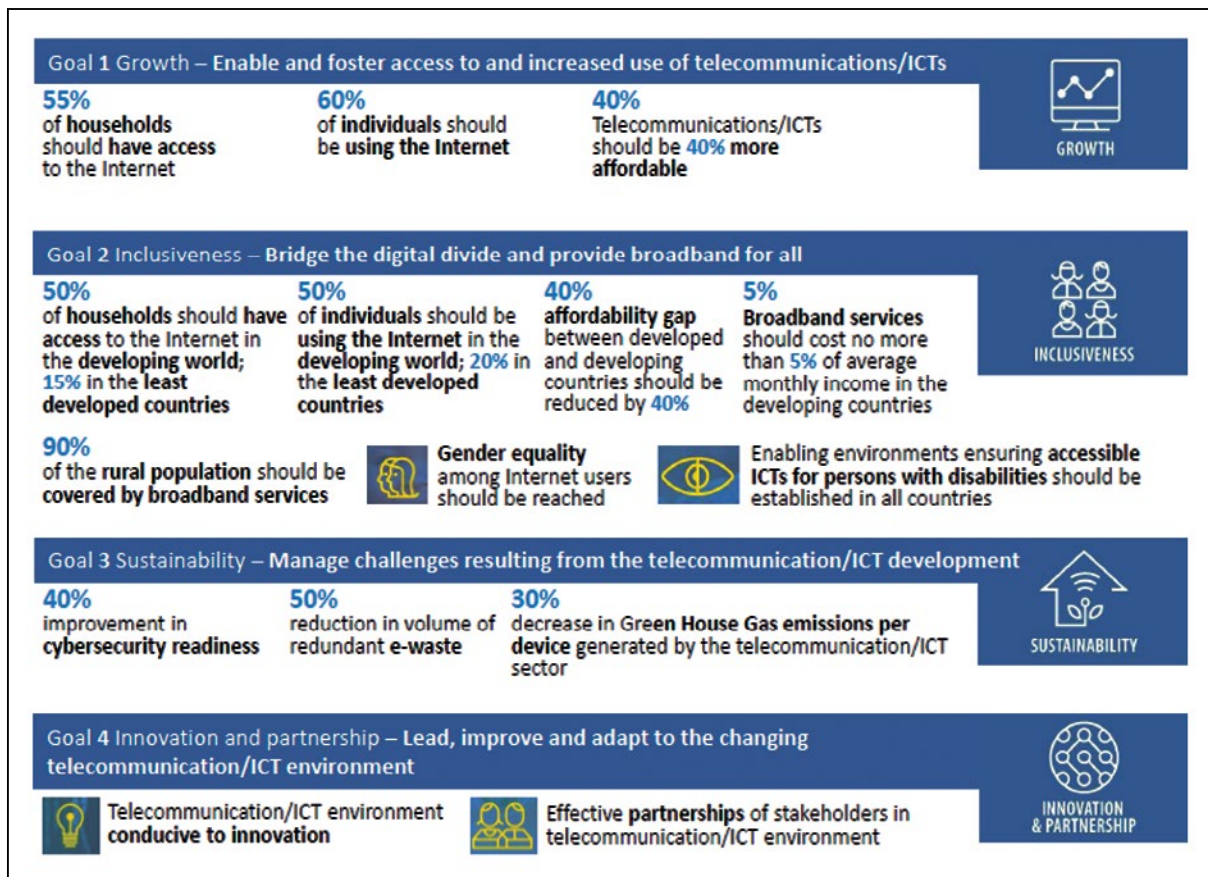


Figure 16: Connect 2020 global goals and target
Source: Connect 2020, ITU

23 Ensuring Positive Impacts of Connecting Sustainably 2014, ITU Blog

	<ul style="list-style-type: none"> • MCMC established the Industry Promotion and Development Grant on Green ICT, managed by MTSFB, to pursue new areas of sustainability and eco-friendliness within the field of communication and multimedia industry. • MCMC also established the Industry Promotion and Development Grant on IoT and New Technologies, managed by MTSFB, to spur the development and adoption of relevant IoT and new technologies innovation and growth in the local industry. • MCMC and MTSFB members are also involved in green ICT, IoT and smart city standardisation work in cooperation with an international organisation such as ITU and Asia-Pacific Telecommunity Standardization Program (ASTAP).
	<ul style="list-style-type: none"> • Digital Lifestyle Malaysia is an initiative to promote and accelerate the development and adoption of applications and services. • It includes the adoption of intelligent IoT infrastructures in Internet-based communications transactions to promote growth and better quality of life.
	<ul style="list-style-type: none"> • Smart Community initiative was established through district level to ensure the service coverage and ICT adoption is being empowered to the whole community in Malaysia. • It intends to encourage the community's digital participation and improve the community's lifestyle through the use of ICT applications.
	<ul style="list-style-type: none"> • Klik Dengan Bijak programme takes a holistic approach on awareness and education on internet safety and security by promoting a shared culture or responsibility with families, schools, industry, government and others in the community, all playing their part to promote positive use of the internet.

Figure 17: MCMC initiatives drives smart sustainable development

MCMC ROLE IN DRIVING SMART SUSTAINABLE DEVELOPMENT

MCMC as the regulatory body of the communications and multimedia industry in Malaysia works in parallel with the activities of UN and ITU. As such, MCMC has also played its part in developing and promoting sustainable growth in Malaysia. Different sectors of the Commission are looking at different aspects of development; from the technological advances, social empowerment and community participation. An overview of these efforts is tabled in Figure 17.

These initiatives highlight MCMC's holistic approach in identifying the key enablers and drivers for smart, sustainable development. While we have accepted that ICTs are the necessary tools and mechanisms, we must acknowledge that smart citizens and communities are the key drivers for SSC as they are the ones who will be living, working and learning in those urban areas.

MCMC's efforts are reflective of the important strategies in Eleventh Malaysia Plan, and we have incorporated some of the SDGs in our programmes as well. Moving forward, MCMC is well equipped to be the enabler and driver towards Smart Digital Communities, Cities and Nation. my.gov.my



L-R: Nur Ain, Shah Rizzuan, Indera, Fiqrie, Mohd Hazizan, Siti Hajar, Haikal

PI1M Pandan Buskers: Creating music, making waves in Sarawak

.myConvergence

A new wave of music has swept the community Internet centre in Sarawak. It is the heart-warming story of a teenage buskers group which originated from our very own community Internet centre on the outskirts of Lundu, Sarawak. The PI1M Pandan Buskers, as they are now known, have been charming people wherever they performed since grouping together about a year ago.

As their name implies, they are based at a community Internet centre in Kampung Pandan, Lundu. 1Malaysia Internet Centres (Pusat Internet 1Malaysia or PI1M) are found in underserved areas throughout Malaysia. Set up to provide broadband access and to digitally empower citizens, these centres has evolved into community centres that encourages collaborations and many other initiatives.

WHO ARE THE PI1M PANDAN BUSKERS?

We are a group of school going teenagers that have been coming to our community Internet centre to improve our ICT skills. We live in the same village. We have known each other since birth and some of us are cousins. Our common love is music and the manager of the Internet centre, our group manager cum performer, helped us set up the busking group.

PLEASE INTRODUCE YOURSELVES.

There are seven members. Our group consists of bass guitarist Indera, 15, vocalists Haikal, 16 and Fiqrie, 14. We have tambourine player Siti Hajar, 12, shaker player Nur Ain, 14 and Mohd Hazizan, the 1Malaysia Internet Centre manager, who also plays the guitar.

WHERE IN SARAWAK ARE YOU LOCATED?

Lundu is located about 100 km from Kuching City. It takes about 2 hours to drive to Kampung Pandan. Our village is near the seaside with attractive beaches. There are quite a few homestays and chalets in our district. Gunung Gading National Park is also close to our village. The mountain can be seen from our village and it is home to the Rafflesia, the world's largest flower.

WHEN DID THE BUSKERS GROUP START?

Pandan Buskers was formed in late 2015. We started discussing about putting together a music group during our visits to the Internet centre. We then started practices and by late November 2015 we were ready to perform.

In December, we performed at the opening ceremony of the PI1M Kg Telaga Air. Our performance was well received and other invites started to come in. We

have performed at weddings and other local events, mostly opening ceremonies of facilities and community gatherings.

WHAT OTHER NOTABLE EVENTS HAVE YOU PERFORMED AT?

We were also at the openings of the 1Malaysia Internet Centres of Pasir Pandak and Sebuloh. We performed at the Hari Komuniti Pintar (Smart Community) in February 2016. The District Officer also invited us to perform at the ground breaking ceremony of the District Office. We performed at SMK Lundu as the opening act of the Battle of the Bands. The period leading to the State Elections earlier this year was a very busy time for us as we were invited to perform at quite a number of events.



PI1M Pandan Buskers pictured with the Chief Minister of Sarawak and other VIPs

WHAT WAS YOUR MOST MEMORABLE OCCASION?

We are extremely happy to be able to perform twice at events which were graced by the Chief Minister of Sarawak, YAB Datuk Patinggi Tan Sri (Dr) Haji Adenan Bin Haji Satem. He was present at the ground breaking event for the District Office and also at another event, 'Jom Kamboh Bersama Tok Nan'.

We were delighted when our Chief Minister danced along to a song we were playing. He then came over and shook hands with all of us. That is something we will never forget.

Our performance at his event also led to our group being in the news. In April 2016, Utusan Sarawak carried a report of the event which featured a photo of PI1M Pandan Buskers.

WHAT ROLE HAS THE INTERNET CENTRE PLAYED IN THE DEVELOPMENT OF PANDAN BUSKERS?

Firstly, that is the very reason we got together as a group. If we were not there on a regular basis, we doubt that this buskers group would have started. It is our base now; where we hold practice sessions most weekends.

More importantly, having access to the Internet allowed us to learn the songs we play at functions. We learn song lyrics and the music arrangement. The Internet is a valuable learning tool and it has enabled us to progressively learn more complex songs.

We also use the Internet to publicise ourselves. We have a YouTube channel where we put up clips of our performance as well as a Facebook Page. Our social media initiatives have enabled us to connect with many people from all walks of life. For example, we are in touch with many prominent buskers in Kuching, who give us artistic advice and tips.

HOW HAS YOUR INVOLVEMENT WITH PANDAN BUSKERS AFFECTED YOUR LIVES AT THE PERSONAL LEVELS?


Our confidence levels have increased. Initially we were all nervous and shy about performing in public. But after so many events, we have become self-assured and this confidence is also reflected in the other aspects of our lives. Our parents were a bit hesitant initially, but they are now totally supportive. We guess, that is because they have seen us develop and bloom.



Performing at the launch of a smart community event

WHAT IS NEXT FOR PANDAN BUSKERS?

We hope to become a full band one day. The instruments we use currently are only suitable for busking. If we can secure the funds to buy proper band equipment, we would be able to perform to larger crowds. We do get some token payments for our performances but that mostly covers our performance expenses only. We hope to save or raise enough funds over time to become a full fledge band.

Another dream that we have is to perform outside Sarawak. It would be awesome if we can perform in Peninsular Malaysia, create music and expand our horizon. 

Connect with PI1M Pandan Buskers:

<https://www.youtube.com/channel/UCyZQIgfPqqX4F50otMxMWZg> (or simply search for PI1M Pandan Buskers on Google or YouTube)

<https://www.facebook.com/PI1M-Pandan-Buskers-1646257139025964> (or simply search for PI1M Pandan Buskers on Facebook)



Making a Better Internet for Children

An intervention programme for excessive internet users born out of the Networked Media Research Collaboration Programme.

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As a forward looking nation, we aspire to be an inclusive digital civil society, a society that is grounded in community values. This is important as values shape how new media and the Internet is used and how it will benefit society. Indeed, as digital participation is being encouraged, access to the Internet and to digital tools continue to grow. In Malaysia, the popularity of social media has been most evident among the young who are the majority of digital users. However, more often than not, opportunities and risks exist side by side in the digital realm. There is a growing concern for child online safety; that while taking advantage of opportunities they are also able to manage their own safety and to be able to handle the risks that may occur. The approach has been to promote digital literacies, building skills and knowledge for access and to be able to take advantage of its benefits. It has thus become all the more an imperative that there should be trust and confidence in the safety of the online world and protection of the young and vulnerable, which is why online safety is consistently a headline theme and a policy pillar of

the communications and multimedia self-regulatory framework.

Recognising this, the Malaysian Communications and Multimedia Commission established the Networked Media Research Collaboration Programme with the aim of building the evidence base comprising research that will be policy-relevant and which will inform and support regulatory decision-making and practice.

The Programme's framework is designed to engage and work with a stakeholder community. It was an educationally enriching experience in itself, working with a community experienced in the provision and management of research as well as those who had among them a wealth of expertise in awareness-raising and in managing safety initiatives. At the intersections of collaborations and conversations with a myriad of stakeholders, we were able to pinpoint knowledge gaps which went on to be articulated and translated into academic research. The iterative process helps to identify future areas of research, giving rise to new and unexpected areas of studies encompassing multiple fields.



to addiction, behaviour patterns that differentiate compulsive usage from normal Internet usage. It has been suggested that the object of addiction may be the content itself – online gambling, pornography, gory or violent content and so on (Widyanto and Griffiths, cited in Millwood Hargrave and Livingstone 2009).

Excessive time spent online has been deemed to result in a negative influence on aspects of youth's lives: declining academic performance, dropping out of school, increased family tension, health problems arising from sleep deprivation

and lack of physical activity and even psychological problems such as anxiety, depression and low self-esteem (Smahel and Blinka 2012). Such conditions stand to affect children's social, mental and psychological well-being.

EVIDENCE OF POTENTIAL HARMFUL EFFECTS

The effects of commercialisation of the internet is an area that also warrants study, as not only can adults be susceptible but children as well, even more so given children's vulnerability to persuasion and exploitation. Some lines of research have also looked at the excessive use of the internet, that is, the dependency on, and excessive use of the internet for social networking.

One of the areas to have received attention in the earlier calls under the Programme was for empirical research in examining the potential harmful effects of the internet on children. Creative and interactive elements of the internet offer great opportunities but at the same time, it highlights the vulnerability of users especially among the young which can lead to detrimental and wide-reaching effects.

It is widely accepted that excessive use has negative effects, and such effects can be comparable

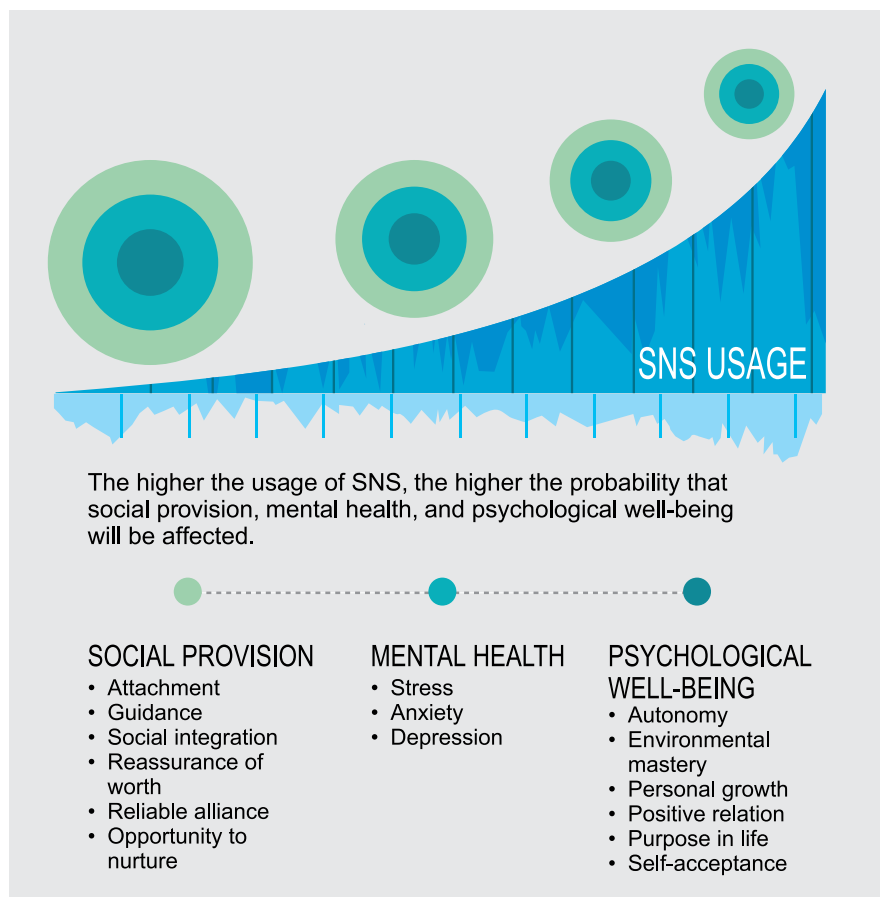


Figure 1: Malaysian young adults' use of social networking sites
Source: Adapted from Ke and Wong (2010)

In a study of Malaysian young adults' use of social networking sites, Ke and Wong (2010) uncovered worrying patterns of problematic internet use resulting in behavioural and mentally detrimental effects. Youths who spent excessive time on social media manifested markedly higher levels of stress, anxiety and depression compared to those who were not frequent users. Their study showed that the higher the usage, the higher the probability that young people will be affected in terms of social provision, mental health and psychological well-being.

From the findings of their study, Ke and Wong (2010) concluded that intervention is critical and needed to reduce the problematic use of the internet by young adults. Studies have shown that children with psychological difficulties may experience more intense, longer-lasting harm (Vandoninck, d'Haenens and Segers, 2012). The researchers went on to develop an Intervention Programme for Excessive Internet Use, which was designed as a manual-based cognitive behavioural therapy programme. The programme was designed to reduce social anxiety and increase social interactions. The research recorded positive results for the pilot study which involved young adult participants as well as for subsequent instalments of their research which involved teenaged participants, thus attesting to the reliability of the programme (Ke, Wong and Marsh, 2014). Such outcomes underpinned a mental and psychological resilience to vulnerabilities that may lead to risks and harm and this case, by reinforcing a strategy that involves reinforcement of positive human interaction.

PARENTAL MEDIATION

What and how should we as parents be advised about our children's use of online technologies? How should we approach parental mediation and teachers or peers mediation in supporting opportunities and reducing risks online? In contemplating this, it is important to be mindful that exposure to risk is not necessarily a guarantee of harm.

Given that exposure to risk is part of everyday life, it also potentially contributes to the development of an increased ability to cope with threats. Children, in particular need to learn how to manage risks. For instance, adventure activities such as rock climbing, sailing and canoeing are some of the ways that children can learn about how to manage risks. And if rules were imposed which made it more difficult for children to swim, then surely the net result will be fewer children who are able to swim and more at greater risk in later life.

Nevertheless, the ability to cope or the level of resilience in a child varies just as some would cope with adversity better than others. Hence, children with greater self-efficacy, those with more psychological issues, who are sensation-seeking will likely experience more exposure (Vandoninck, d'Haenens and Segers, 2012). Some studies have suggested that an increasing number of children who coped better were those who confided to others about their online problems and employ different problem-solving strategies such as deleting unwelcome messages and blocking contacts. With this in mind, those in a position of providing support to children would

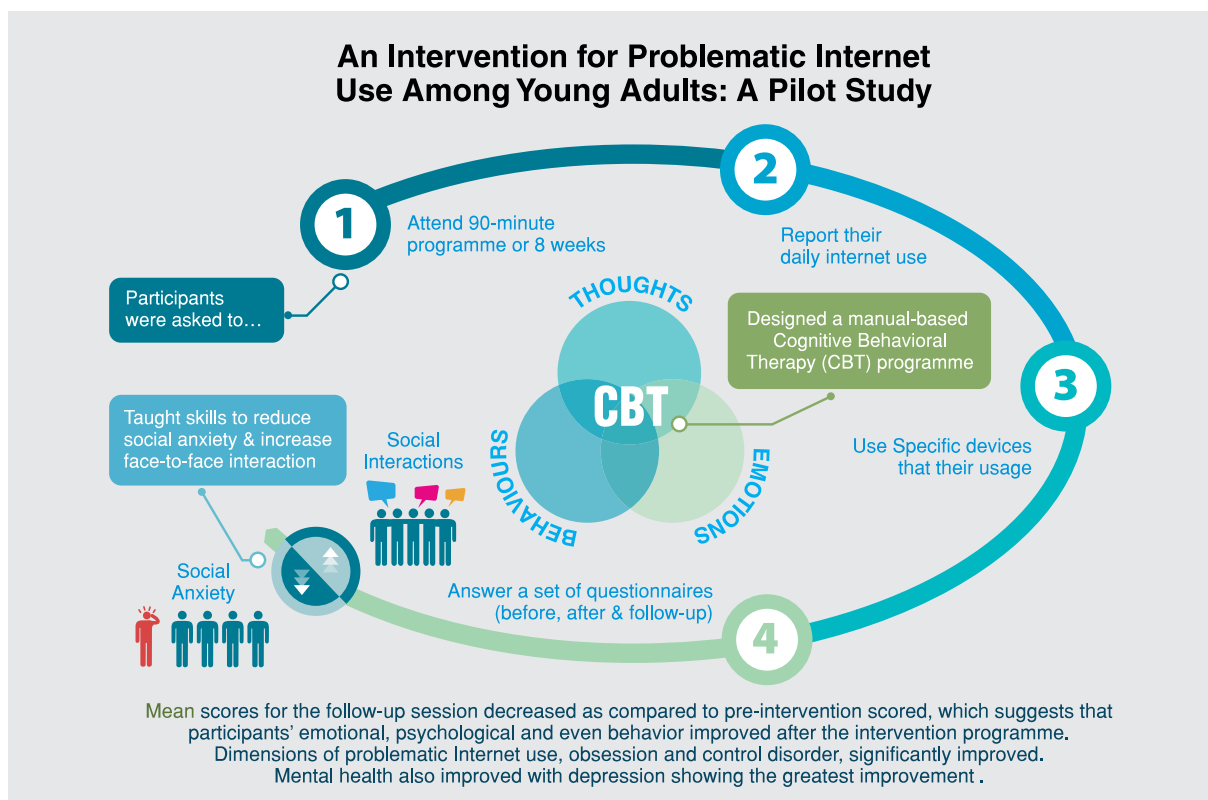


Figure 2: Process flow of Intervention Programme for Excessive Internet Use
Source: Adapted from Ke and Wong (2010)



Research Grant Award Ceremony held on 11 Aug 2016 at Cyberjaya for studies on how groups within the community including young children and teenagers are using the internet.

be best positioned to be agents for engendering more proactive strategies (Vandoninck, d'Haenens and Segers, 2012).

There have been studies to look into how children use the Internet and what risks were encountered online and their online safety. These crucially form the underpinning evidence base for every actor working in the area of online safety that helps shape strategies for a better internet for children in the context of digital and media literacy.

The 21st century is the era of the ubiquitous internet. In this era, we aspire to bring up children and future leaders who will have the access, skills, competencies and trust to enjoy rich online content and its multitude of services. As computer-mediated communication continues to evolve, studies need to be carried out to help us understand how people are adapting to the interactive features and to track and garner insights into its impact on the individual and the wider community.

At the same time, we want our children to be safe and protected when they are online and we should equip them with the abilities to navigate the digital landscape and have the skills to unlock the doorway of digital opportunities. To succeed at this, we need a concerted and coordinated effort among families, schools and communities. Public policy and government resources should be calibrated to support the transformative effects and if done right and based on the right choices, we can significantly improve the way our children learn and additionally, how young people and future generations are taught to learn. Schools are best equipped to teach these important digital literacies, particularly if they are acknowledged, as they are in many parts of the world, to be an integral component of essential life skills for the 21st century and beyond.

Since parents are responsible for their children's education, they play a vital role in limiting risks and harm to which their children may be exposed. In their study on this, Garmendia, Garitaonandia, Martinez and Casado (2012) identified several mediation approaches adopted by parents in their study, namely, active mediation of internet use and safety to restrictive, monitoring and technical mediation. Their study concluded that children's exposure to different risks, restrictive and

monitoring mediation approach were more significant. On the other hand, such approaches had a negative effect in that it significantly reduced opportunities and in terms of online activities and digital skills. While there are benefits to be gained from restrictive mediation, researchers stress on weighing in on the cost to reducing their freedom to interact with peers online against the disadvantages of reducing the number of opportunities available to their children from using the internet. The researchers concluded that there is no ideal model of mediation and it was suggested that restrictive mediation should be employed in particular situations only.

Many studies have shown that support from teachers and peers positively affect children's digital skills and their range of online activities (Kalmus, von Feilitzen and Siibak, 2012). This potential for reducing online risks and harm found in teachers can be realised by improving their digital (online) competences.

FOCUS ON HUMAN OUTCOMES - TECHNOLOGY ONLY MIRRORS THE SOCIETY IT SERVES

The world is changing in so many ways. Technology in particular is shaping the future of our children. While technologically motivated changes can be disruptive, it undoubtedly spurs social change and economic benefits. Nevertheless, technology in itself is never the reason things change but rather it is how we choose to use technology and whether we use it wisely to address real needs that make a difference.

Amidst the interconnectedness of communications today, it seems to prescribe that the more connected we are the better. Social media increasingly underpins our social relationships. What is the social significance of such reach and connectedness? Be as it may, it is the relationships among people and their values that engender the interconnected world that is made possible by the internet.

The use of networked technologies is transforming the nature of learning and literacy in schools and in the workplace - in how we read, view, search, share and connect. Clearly, we need to adapt to new technologies.

If we fail, we will encounter devastating illiteracies that will create a gap in society and among communities deeper and more differentiating than ever experienced. Children need to know how to acquire pertinent information from an infinite sea of electronic data and information, how to analyse and evaluate it, how to create it, how to synthesise and reflect on it, and how to act on it or use it when the need arises.

Hence it is our obligation to do everything within our power to ensure that every citizen has access to the Internet and every opportunity to learn the skills to apply digital technologies for personal advancement as well as for the common good.

If we want the communications ecosystem to have the right kind of impact on society in the future and to help us build a society which is environmentally and socially sustainable, we must ensure that our core values are preserved and enhanced. We should bear in mind also that a progressive society endeavours to facilitate or to remove whatever hinders us from accomplishing broader social goals. As a progressive society, we should strive to continually better our standards as technology advances and ensure that the communications network lives up to key values and expectations that are at the very least on par with global best practices. To do this, we should focus on human outcomes, and not technology. For the young, we should prioritise the development of their emotional, educational and moral competencies, bearing in mind that when programmes and initiatives are designed to address these desired human outcomes, only then can technology advance our goals. This includes preserving values of the family, in its many forms, as a source of love and support for individuals and the basis for a caring community, the kind of community that should be preserved into the future.

TOWARDS A DIGITALLY INCLUSIVE FUTURE

In this digital age, we need to adapt our policies, priorities and personal choices to account for the realities of this era. Our educators, those who are tasked with delivering a digitally-skilled workforce to meet business needs of the future, face a formidable challenge to equip students with the necessary life skills.

With the prospect of lengthening lifespans, it is conceivable that automation and technological platforms will have an immense and profound impact on the nature of work and careers. What vision of the digital future would this conjure up, particularly for parents and how would we prepare for this? And because of this, we ought to want to see better and further into the future.

Digital participation is a means to empower societies within a frame of inclusive globalisation (Annan 2002). Within this frame, it is critical that we endeavour to understand our societies and communities along the lines of age, education, class and geography. The challenge is to bring a compelling narrative of an inclusive digital civil society to our communities, to those who have not grown

up with the internet, who do not have the opportunities to travel, or to know first-hand of the opportunities and benefits of an interdependent global community. But this community cannot be built overnight, and for that we need to take a longer-term view.

So it is not about the next change that technology advancement will bring. It is about making sure that the future generations relate to one another, establishing ties with people that they may never meet, reaching others through uncommon channels and champion a cause, coming together as a community and not least of all, how we empower future generations to lead the way.

An Intervention Programme for Excessive Internet Users was developed under the funding of the Networked Media Research Collaboration Programme (NMRCP) which is aimed at collaborating with institutions of higher learning. The NMRCP is a programme that is managed and fully funded by the Malaysian Communications and Multimedia Commission. [MCMC](#)

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Content And Applications For Smart Communities

Innovative content and applications are essential components in the creation of smart communities.

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It is widely recognised that information and communication technologies (ICTs) are needed to develop and nurture a smart city. 'Five ICT Essentials for Smart Cities', a white paper by the Escher Group, emphasizes the five essential elements for any smart city planning policy related to ICT, consisting of the deployment of broadband networks; use of smart devices and agents; developing smart urban spaces; developing web-based applications and e-services; and opening up of government data.

These ICT elements are closely related and build upon each other to provide a comprehensive ICT solution. The availability of broadband networks and smart devices would ultimately stimulate the development and adoption of new applications and services that help to improve community's competitiveness; deepen social inclusion and enable developing countries such as Malaysia to become a developed nation. The Eleventh Malaysia Plan (RMK-11) (2016-2020) emphasises the development of ICT as one of the national transformation catalyst and the local content and applications industry was cited as one of the important sources of economic growth.

THE CASE FOR SMART COMMUNITIES

A number of terms such as intelligent city, digital city, MESH city, information city, ubiquitous city and so on are used to describe smart communities. One concept of a smart city that is widely used is the improvement of a community's quality of life through the use of ICT applications. Another crucial objective of building a smart city is to bring real benefits to the community that encourages innovation and creativity within it to create real economic opportunities.

The potential benefits of smart communities or smart cities for Malaysia are huge. They deliver important benefits like enhanced rural economic growth, services and social opportunities, transformation and establishment of industries, the creation of higher paying jobs that retain and attract skilled people and the enhancement of public services such as education and public safety.

In line with this direction and to support the RMK-11 by building a better Malaysia for all Malaysians and achieving a smart nation status by 2020, Malaysian

Communications and Multimedia Commission (MCMC) embarked on the Smart Community initiative in 2015 as a foundation for transformation toward a smart nation. This is also in line with the ASEAN ICT Masterplan 2020 that propels ASEAN towards an innovative, inclusive and integrated ASEAN community with a digitally-enabled economy. Various ICT related programmes have been formulated and planned to ensure that the Smart Community initiative is a sustainable model and it continues serving and benefitting the community.

THE APPROACH

The development of smart communities requires conscious efforts by government, businesses, institutions and individuals. It is not the product of a pure free market or just government policy alone; it requires a collaborative effort by all the stakeholders in the ecosystem.

In view of this, MCMC has increased its efforts in outlining and implementing both short-term actions as well as long-term strategy. It has formed strategic partnerships with local municipals, businesses, institutions and community leaders to ensure the success of the programmes.

The first Smart Community pilot project in Kemaman was very educational. One learning that came out of it was that the success of a smart community initiative does not only depend on a reliable communication infrastructure but with the engagement of the people (community). It requires a bottom-up engagement approach and the existence of local champions. Another key principle that ensures the success of a smart community is to nurture an ecosystem that is conducive for content and applications development.

CONTENT AND APPLICATIONS PROGRAMMES

Our content and applications programmes are tailored to build an ecosystem that continuously encourages the community to make use of ICT to develop new content and applications which will help in developing a new generation of tech-savvy communities.

MCMC sees the value ICT can play in empowering the communities through ICT skills training, education, innovative solutions and entrepreneurship. This programme helps in capacity building and provides the opportunities for communities to learn and share knowledge and with hands-on experience at various levels.

Since 2008, MCMC has supported the creative content and applications industry. Among its initiatives are the provisions of incentives or funding for SMEs to develop creative content projects, bursaries for multimedia related courses, sponsorship for content conferences and market access, organised a series of capacity programmes like hackathons, short videos competitions and the formation of partnerships with various stakeholders.

From our experience of managing the creative content funding, we learned that the major challenge that hinders the development of the creative industry is the lack of skill sets in the industry. Given this, MCMC is working to formulate relevant programmes for industry participants to enhance their knowledge and upskill their skill sets. Some programmes have started since 2015, and many more programmes will be introduced over the years leading to 2020 in line with the objective of the Smart Community Initiative.



Statistics of #MyKIF workshops organised in 2016

MYKOMUNITIKREATIF (#MYKIF)

MYkomunitikreatif (#MyKif) is a programme to encourage communities at 1Malaysia Internet Centres (Pusat Internet 1Malaysia, PI1M) to produce short videos in the form of tutorials, guidelines, tips, advice, instructions, information, recipes or any relevant local stories to be shared with the rest of the communities. The content will be made available on various channels such as YouTube and the My 1 Content portal.

The objectives of this programme are to promote knowledge-sharing among communities through digital content; create excitement for digital content development and to build local community support for the Smart Community initiative. The opportunities provided by these digital content and services will enable communities or consumers to progress beyond being mere consumers of content and become participants who are able to actively create and share content.

The #MyKif programme has two categories: #Mykif short film workshop and #Mykif Video Competition.

In the first category, MCMC arranged for a series of #MyKif short film workshops that were facilitated by our program partner, the National Arts and Culture Academy (ASWARA). Table 4 provides the list of workshops organised at 1Malaysia Internet Centres nationwide in 2016.

In the other category/programme which is the #MyKif Video Competition is aimed at developing creativity and encourage innovation amongst communities. It is open to all communities at PI1M and participants can submit their videos individually or in a group. Participants are encouraged to submit any videos that are related to daily routines such as tips, arts and crafts, health tips, fashion or travelogue with durations of less than 5 minutes. Submission of videos must be done online at <http://mykif.mcmc.gov.my>.

As of 31 December 2016, a total of 1988 short videos have been submitted for Phases 1 to 4 of the #MyKif video competition. A panel of judges comprising representatives from MCMC, Telekom Malaysia, ASWARA and Perbadanan Kemajuan Filem Nasional Malaysia

(FINAS). The winners of the contest stand a chance to receive cash prizes and certificates.

To take this programme to the next level, selected videos which contain unique creative ideas will be invited to apply for funds for further development under the YouTube funding programme offered by the Content Malaysia Pitching Centre. There will be a special pitching session organised by MCMC in collaboration with FINAS for selected winners to pitch their ideas for development funding.



Panels of Judges for #MyKif Video Competition

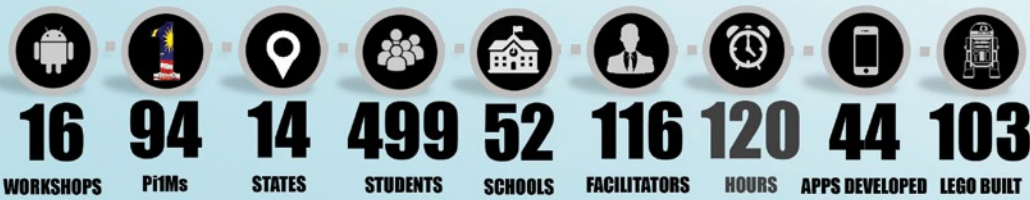
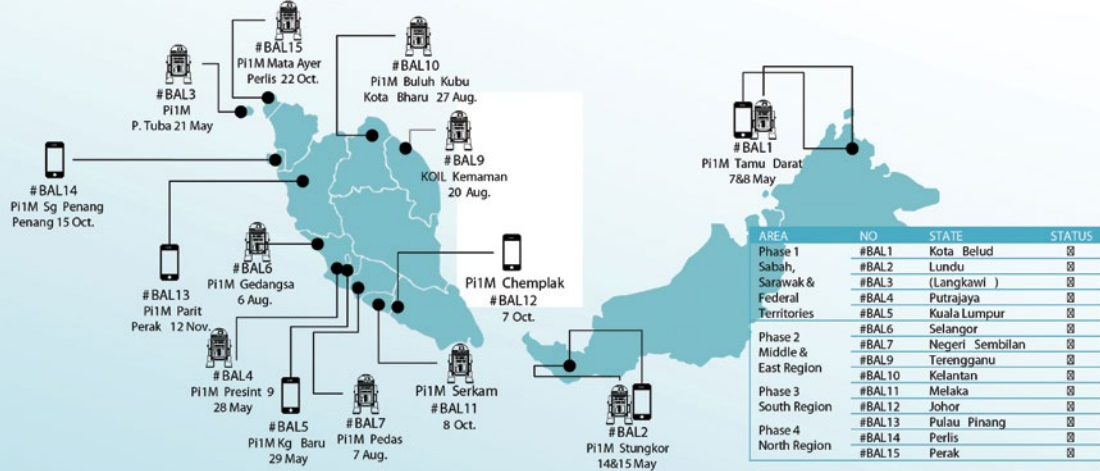
APPLICATIONS DEVELOPMENT & LEGO EDUCATION WORKSHOP

The Applications Development & LEGO Education Workshop (#BAL) aims to ignite the imaginations of students on the exciting opportunities available to students in science and technology, as well as to provide communities with innovative ideas for mathematics and science lessons.

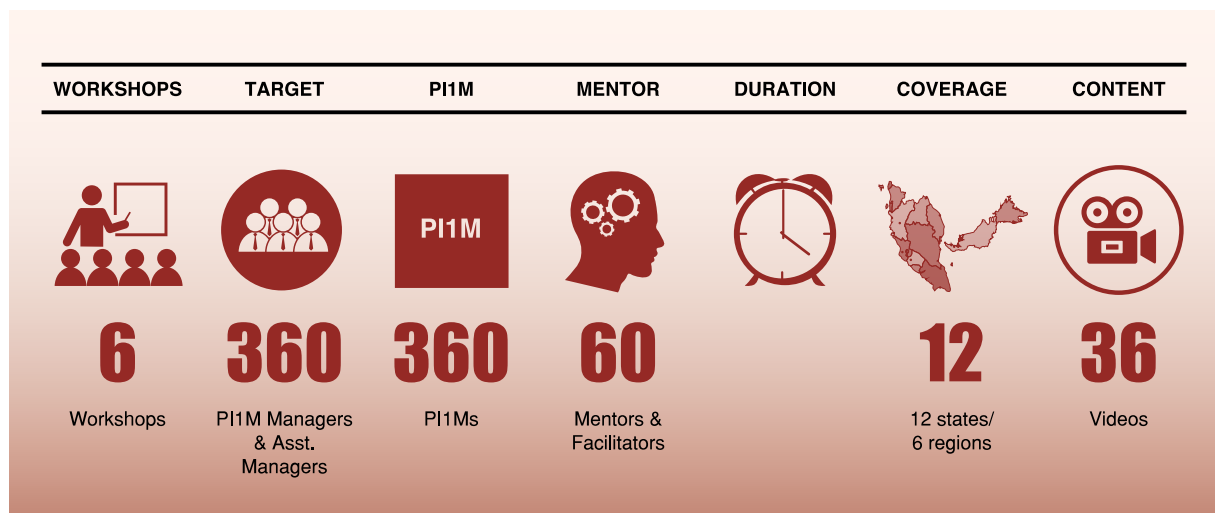
The #BAL Workshops consist of Applications Development workshop and LEGO Education workshop. The Applications Development workshop provides a platform for school children to learn basic coding and develop prototypes for new applications whereas the LEGO Education Workshop is a platform for them to build robots from LEGO building blocks based on LEGO MINDSTORM sets. #BAL is a collaborative programme by MCMC in partnership with Institutes of Higher Learning (IHLs) and businesses. Partners from IHLs and Sasbadi (the LEGO distributor) are responsible for providing guidance and training to the participants.

APPS & LEGO WORKSHOP (#BAL)

#BAL consists of two workshop module i.e. mobile application development (Apps) and LEGO education workshop. Apps workshop uses software such as MIT Apps Inventor, Game Salad and Construct 2 to develop mobile apps and mobile games. LEGO Workshop uses MINDSTORM EV3 set. Participants will experience hands-on activity while assembling the LEGO parts and subsequently learn graphical basic coding during programming stages.



Statistics on Apps and LEGO workshops (#BAL)



Statistics for #SKS programmes in 2016



#SKS Strategic Partners from IHLS in 2016



1Malaysia Internet Centres / PI1M managers and participants at Lego Workshop at Precinct 9, Putrajaya

The workshops were kicked off in Kota Belud, Sabah in May 2016, and followed by other locations such as Lundu (Sarawak), Langkawi, Putrajaya and Kuala Lumpur. Similar workshops will be organised at other locations throughout the nation.

As of December 2016, a total of 499 students aged 13-17 have attended the workshops. The programme involved 27 schools and 33 1Malaysia Internet Centres/PI1M.

SCRIPT TO SCREEN WORKSHOP (#SKS)

#SKS is a tailored workshop specially formulated to enhance the skills of entrepreneurs to produce quality videos that promote their local products. It addresses concerns that promotional videos of local products produced by local entrepreneurs lack quality. The programme is divided into 3 phases.

Phase 1:

Phase 1 was implemented in 2016. This implementation was a Train the Trainers (TTT) programme targeted at the Managers and Assistant Managers of 1Malaysia Internet Centres/PI1M. The programme was launched in Sabah in June 2016. It is being replicated in Sarawak, Southern, Northern, Eastern and Central regions in the second half of 2016.

Phase 2:

Phase 2 will be implemented in 2017. Phase 2 will be a series of workshops for local entrepreneurs at the various

PI1Ms nationwide facilitated by the managers who were trained in Phase 1.

Phase 3:

Phase 3 is planned to be implemented in 2018 and here continuous workshops being targeted at the rest of the 1Malaysia Internet Centres/PI1M that were not covered in 2017.

Pilot Project

The first pilot #SKS project was held in June 2016 in partnership with University Malaysia Sabah (UMS). 60 PI1M managers participated. The two-day workshop



1Malaysia Internet Centre/PI1M Managers at the #SKS workshop in Sabah (1-2 June 2016)

programme included theoretical video production, script writing, video shooting and editing. The programme experts comprised experienced lecturers from UMS assisted by the university's multimedia studio crew. A total of 6 videos on the theme of Public Service Announcement (PSA) were produced at the end of the workshop. These videos are available for viewing at the #SKS website.

As of December 2016, a total of 360 PI1M managers have been trained in collaboration with IHLS, namely UMS, UMK, MMU and USM.

MALAYSIA'S FLOOD WARRIORS DOCUMENTARY

Malaysia's Flood Warriors is one of the programmes produced under the Content flagship of the Kemaman Smart Community. It is a 45-minute documentary that tells the story of the devastation brought about by the floods in Kemaman in 2014. Despite the ravages wrecked by the floods and the resultant challenges, the close-knit community of Kemaman persevered and became a national role model community in managing floods.

Before it went into full production, a 5-minute trailer was produced and showcased during the KL Converge! 2015. The complete documentary was completed in May 2016. The documentary was aired by Discovery Channel in August 2016 in conjunction with the Hari Merdeka 2016.

SHORT VIDEO DOCUMENTARIES FOR KEMAMAN

As part of the initiatives to encourage communities to develop local content, professional videos have been initiated by MCMC for the Kemaman Smart Community. The objective of the project is to promote Kemaman as one of the model smart districts in Malaysia. There are five 3-minute videos about Kemaman on Kemaman history, local gastronomy, culture and tourism.

The production of the videos is a continuation of the Kemamanku Storytelling Competition organised by MCMC in March 2015. The content of the videos is mainly based on the facts and sources provided by the Storytelling competition that involved communities in Kemaman.

The videos are available on MCMC's YouTube channel. The videos are also made available in a DVD Set Box. A special coffee table book about Kemaman has also been produced. The DVD Set Box and coffee table book are available at the Kemaman District and Land Office, Kemaman Library, selected 1Malaysia Intrenet Centres/PI1Ms and the Ministry of Tourism and Culture Malaysia, Terengganu office.

THE CHALLENGES

Among the main challenges of a smart community implementation is engaging the community effectively, getting the attention of the local leaders, the coordination of multiple collaboration players and getting across the vision and way forward to the community.

Since a smart community is meant to be demand or community centric, the challenges include the need to analyse and identify where the community stand today and offer specific guidance, identify areas where the

community can most effectively focus their efforts to make sustainable progress in the future.


In our quest, we also noted that other than acquiring all the critical ICT elements to make the communities 'smarter', the implementation of ICT strategies in smart communities will also require the development of sustainable partnerships and strategies to ensure fast conversion of communities into smart communities.

THE WAY FORWARD

In continuing our efforts to encourage the use of ICT in improving communities' quality of life, MCMC continues to research and study how other communities use ICT to build economic prosperity, solve social problems and enrich their cultures. The Smart Community Initiative has chosen the Intelligent Community Forum Indicators as the conceptual framework for understanding the factors that determine a community's competitiveness toward the goal of becoming 'intelligent'.

The Intelligent Community Forum (ICF) is a global network of 145 countries and regions that are identified as intelligent communities, sharing knowledge and pursuing joint development among communities. The ICF has developed and worked to refine five Indicators namely broadband connectivity; digital inclusion; knowledge workers; innovation; and marketing and advocacy. The ICF Indicators provide communities with a basis for assessment, planning and development of a soon to be 'intelligent community' or 'smart community'.

Besides the ongoing execution of content and applications related programmes, more strategic programmes are being researched and formulated based on the benchmarked indicators used by other communities worldwide. As broadband connectivity and digital inclusion are advanced, factors like knowledge worker, innovation, marketing and advocacy are given more attention.

MCMC is taking up the challenge as it continues to create collaborations with local councils, government agencies, universities and communities building more smart communities. These initiatives are laying the foundations for a smart digital nation and achieving the development targets of Vision 2020 and the 11th Malaysian Plan. 



Converged Telecommunications Policy and Regulations Master Class

The CTPR Masterclass Programme brings telecoms professionals up to speed with regulatory policies.

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The technologies that serve as the bedrock of the global telecommunications industry have evolved at a frantic pace. Consumer lifestyles have become increasingly digital-focused, more so with the convergence and confluence of communications, multimedia and content. The dizzying speed of technological advancement (4G, LTE and the upcoming 5G) has placed immense pressure on industry players, equipment manufacturers and vendors to deliver their products and services quickly to an increasingly savvy and demanding public.

Industry regulators and practitioners have not been spared as well. These evolving technologies and converged telecommunications space have placed increasing pressure on regulators and practitioners worldwide to keep up with the latest technology trends, spectrum management issues, policies and regulatory frameworks and guidelines while balancing national developmental and business concerns with those of a consumer-led social media, digitalised and converged world. As a result, there is a need to regularly revisit,

enhance or tweak policies, regulations, codes of industry conduct, industry specifications and norms to better reflect these rapid changes. The policy and regulatory framework for the Telecoms and ICT sectors must evolve when required to facilitate the progressive growth of the industry for the benefit of all stakeholders. To cope with a constantly changing converged industry, the skill sets, competencies and knowledge bank of industry stakeholders and practitioners should be updated and gaps filled.

It is imperative to address the widening gap in regulatory knowledge and skill sets of industry stakeholders. Current research indicates that there is a dearth of professional postgraduate and advanced training programmes that seek to address this imbalance. This gap is the driver behind the collaborative effort between Malaysian Multimedia University (MMU), GSM Association (GSMA) and Malaysian Communications and Multimedia Commission (MCMC) in designing the 'Converged Telecommunications Policy & Regulations Master Class' (CTPR).

GOALS AND TIME FRAME

The Professional CTPR Master Class is designed for mid to senior level executives/professionals in national regulatory agencies, relevant government ministries, telecommunication service providers, broadcasters, and equipment manufacturers/vendors in the Asia Pacific Region. It delivers a holistic and up-to-date world view on all matters related to the converged telecommunications space. The programme is designed with the following goals:

1. Exposure to latest global thinking on converged policy & regulatory matters and the way forward in support of capacity building in this knowledge domain;
2. Better understanding of related global legislations and regulations as well as a holistic appreciation of key issues to enable them to engage in multi-stakeholder and multi-disciplinary discourse, policy-shaping and decision-making in the telecommunications space;
3. Exposure and understanding of latest technological advances related to the industry and where it is heading and its socio-economic impact; and
4. Networking with noted local, regional and international industry thought leaders.

This intensive programme brings together an international collaborative network of academics, institutions, and industry experts in the area who highlight current global approaches to these issues. The Professional CTPR Master Class is a first of its kind in the Asia-Pacific region, and upon completion, participants will receive certificates that are endorsed by all three collaborative partners - MMU, GSMA and MCMC.

THE DRIVING FORCES

MCMC (the Convergence Regulatory Authority), MMU (Academic) and GSMA (Global Industry Association) are the three driving forces behind the Professional CTPR Master Class.

MMU is Malaysia's first private university; established in 1996. The university offers a full range of undergraduate and postgraduate degree programmes in Law, ICT/IT, Creative Multimedia, Cinematic Arts, Engineering, Management, Business, Accounting, Banking and Finance across its three campuses in Malaysia. Currently, www.topuniversities.com ranks MMU as a Top 200 World University by Subject in Electrical and Electronic Engineering.

MMU, through its Graduate School of Management, Faculty of Management brought together seven faculties and its IT Services Division for this collaborative professional development mission. This programme supports the aspiration of the University to fulfil its

corporate social responsibility obligations by educating the next generation leaders and knowledge workers.

The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators and more than 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. GSMA also produces industry leading events such as Mobile World Congress, Mobile World Congress Shanghai and the Mobile 360 Series conferences. This programme complements the GSMA's long-term capacity building goals and programmes in helping regulators

GSMA MCMC MMU MULTIMEDIA UNIVERSITY

CONVERGED TELECOMMUNICATIONS POLICY and REGULATIONS (CTPR) MASTER CLASS

Register About Programme Speakers Contact Us

Converged Telecommunications Policy and Regulations (CTPR)

Converged Telecommunications Policy and Regulations (CTPR) Master Class is designed in a way to offer mid to senior level executives in national regulatory agencies, relevant government ministries, operator companies, broadcasters, equipment manufacturers/vendors in Malaysia and the Asia Pacific Region a holistic and current world view on all matters related to the converged telecommunications space.

This intensive three (3) week programme brings together an international collaborative network of academics, institutions, and industry experts to provide a global and current perspective to these issues.

For any enquiries, please [contact us](#).

REGISTER NOW!

Register 1

Full Name:	<input type="text"/>	Email:	<input type="text"/>
Designation:	<input type="text"/>	Contact Tel. No.:	<input type="text"/>
Organisation:	<input type="text"/>	Address:	<input type="text"/>

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develop effective policies to grow economies and digitally empower their people. Asia is a diverse, highly dynamic and fast-growing region and regulators there need to be well-equipped to meet their nation's development challenges.

MCMC leadership views this Master Class as timely and relevant. It is charged with overseeing the regulatory framework for the converging industries of telecommunications, broadcasting and online activities in accordance with the national policy objectives set out in the Communications & Multimedia Act 1998 (CMA 98).

The course was facilitated by local and international industry experts, as well as subject matter experts from MMU and a local university. CTPR provides added socio-economic value from the perspectives of global knowledge sharing, understanding the local and international industry scenario and enhancement of knowledge and skills that contribute to personal and organisational benefits, be they tangible or intangible. It offers added value in serving the ICT workforce on a platform of 'Built to Learn with CTPR Master Class'.

THE PROFESSIONAL CTPR MASTER CLASS

Participants for the first Professional CTPR Master Class convened at Cyberjaya from 5th October to 23rd October 2015, and they included local industry players and government representatives. The latter included MCMC and Ministry of Communications and Multimedia officers. Participants came from as far as Bangladesh, Cambodia and Indonesia.

a top 5 project (out of 27) in the Communication and Information Infrastructure Category at the recent World Summit on Information Society Forum 2016 (WSIS 2016)).

Diagram 2 depicts the structural content of the first Professional CTPR Master Class' encompassing 5 themes; 13 Modules; 65 Topics; 2 Work Group Assignments; 65 Participants; 3 Adjunct Professors; 43 Speakers; 15 Agencies; 16 Days of Master Class Sessions, 160 hours of interactive sessions and 2 industry visits.

The Professional CTPR Master Class is an intensive programme delivered through lectures, discussions, case studies and group presentations. Dinner talks provided the added value as an informal platform but with first-hand information from industry leaders. The blended learning and interactive teaching methodology leveraged on webinars, group work, case studies, structured online learning, presentations, industry talks and industry visits. The webinar sessions have been introduced to allow interactions between participating organisations and facilitators as platform for exchange of ideas in a collaborative mode. The structured online learning is supported by the Multimedia



Diagram 1 : Participants of CTPR Master Class

The Professional CTPR Master Class content covers relevant topics on Principles of Telecommunications Policy; Emerging Perspectives in Policy and Regulations; Economic and Social Policy and Regulations; Internet Governance; Business Strategy for Telecommunications Industry; Spectrum Management; New Directions in Digital Services; Data Enablement Framework and Big Data Analytics; Network Security and Forensics; Network and Digital Economy; Intellectual Property Rights; Creative Content Industry; Social Research Methods, and Research Advances in CTPR.

Sixty-five topics were structured within these thirteen modules in the 3-week intensive master class. Two industry visits were included involving a visit to the Telekom Malaysia Network Operation Centre and a Smart Community Initiative in the state of Terengganu located in the East Coast of Peninsular Malaysia. This Smart Community Initiative was listed as



Diagram 2 : An Overview of Activities and Resources for CTPR Master Class

Learning System (MMLS) of MMU through which learning tools, quizzes, learning notes and electronic resources are shared. Group work assignments are incorporated to

motivate and deepen the social networking amongst the participants and facilitators.

The Professional CTPR Master Class programme received overwhelming support from the government sector and the industry as seen by the participation numbers and the sharing of experiential knowledge. The collaborative partners have moved on to the second CTPR Master Class in Cyberjaya as a topical programme on Smart Digital Nation, Cities and Communities (SDNCC) in August 2016 and the third will be held in Bandung, Indonesia in November 2016.

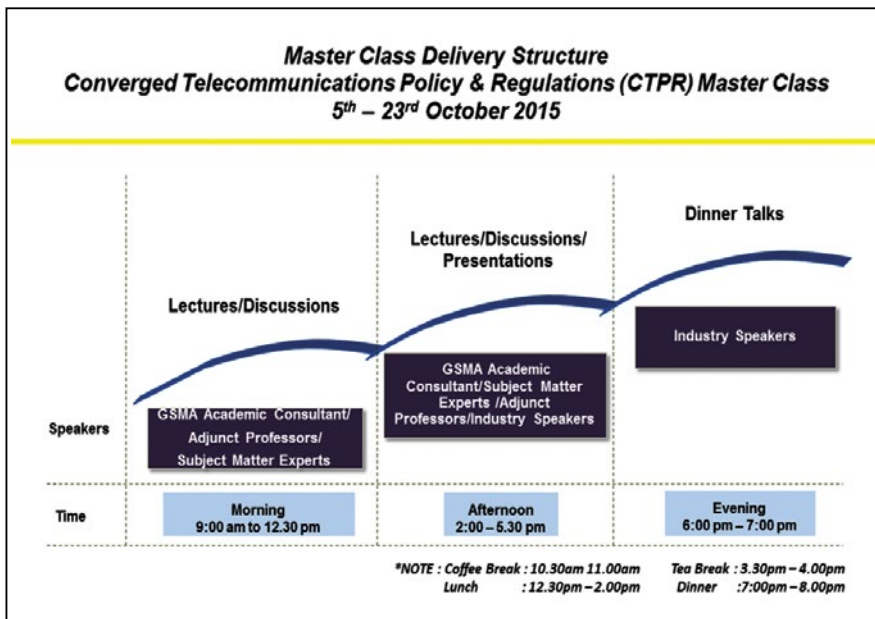


Diagram 3 : An Overview of CTPR Master Class Delivery Structure

CHALLENGES AND CONCLUSION

As in many capacity building explorations, the Professional CTPR Master Class is no exception in encountering its teething challenges. For one, industry stakeholders globally have encountered many rapid changes which trigger the need for policies, regulations, codes of industry conduct, industry specifications and norms to be revisited, enhanced or tweaked to better reflect these rapid changes. Another challenge was its relatively long duration which affected



Diagram 4 :Blended Learning Approach



Industry Visit at Smart Community Initiative in the State of Terengganu (East Coast of Malaysia)



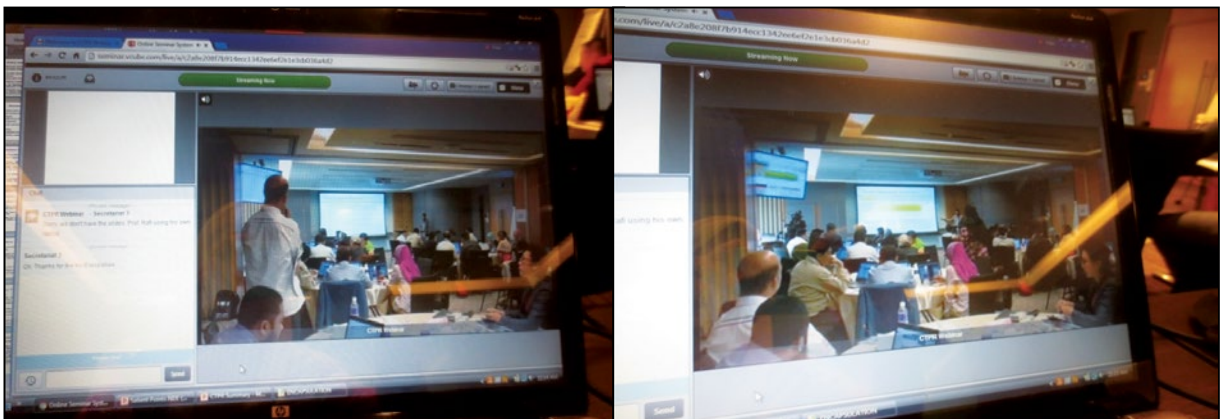
Dinner Talk and Social Networking



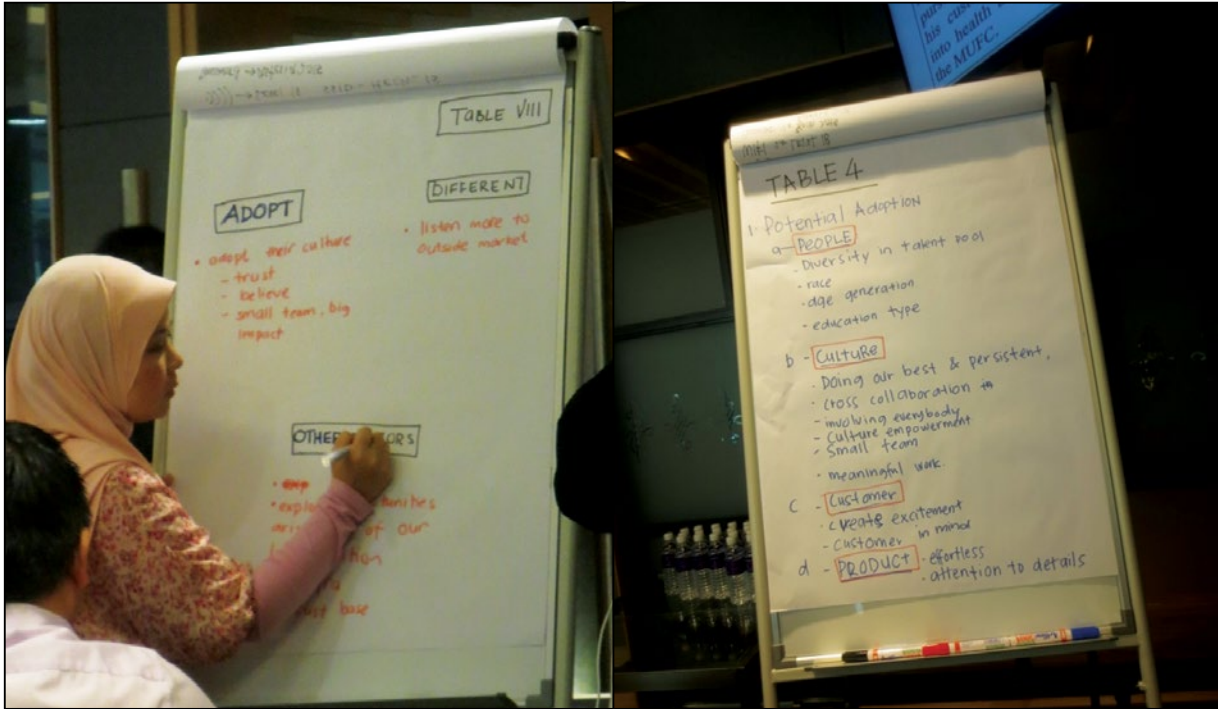
Group Assignment Presentation



Interaction with Subject Matter Experts (SME)



Webinar Session



Dinner Talk and Social Networking



Group Assignment Presentation

the organisations involved as they had to schedule their workforce.

However, a programme such as the Professional CTPR Master Class is important as it supports the World Summit on the Information Society (WSIS) Action Line C4 which is Capacity Building in ensuring that 'everyone should have the necessary skill sets to benefit fully from the information society'. The action line calls for governments, in cooperation with other stakeholders to create programmes for capacity building with an emphasis on the establishment of a critical mass of qualified and skilled ICT professionals and experts to drive innovation

towards the digital economy. It encourages the design of specific training programmes in the use of ICTs to meet the educational needs of ICT professionals, and other relevant professional groups. The training of ICT professionals should focus not only on new methods and techniques for the development and provision of information and communication services but also on relevant management and leadership skills to ensure the best use of technologies. It invites countries to promote international and regional cooperation in the field of capacity building, including country programmes developed by the United Nations and its Specialised Agencies.

Through real-world examples of regulatory best practice, and by leveraging insights and knowledge of the industry, the CTPR master class participants will keep pace with the latest developments in technology, business environment, and understand the implications of different policy and regulatory approaches.

Moving on, there will be continuous and sustained efforts to ensure that this Professional CTPR Master Class continues to grow, evolve and build on its experiences and successes. It may be offered on a modular basis with each class offering a selection of modules, making it more accommodative to the working life of the professionals. The new format will not be so taxing on participants and organisations as each class will be over a slot of a few days.

It is also felt that continued networking among the participants would be useful. For this reason, the Community of Professional CTPR (COC) was created and it will be facilitated under the concept of continuous learning which will encourage the sharing of knowledge, updates and latest developments related to the content. There will also be special events and invitations to related symposiums, seminars, conference and the like. So, do join the Professional CTPR Master Class - the mastery of policies and regulations and continued industry networking goes a long way in career development and progression in the complex regulated communications and multimedia industry. [my](#)

Some verbatim feedback from participants of the CTPR Master Class.

- *Wonderful experience... having intellectual discourse with the experts and industry colleagues... and thoughts shared by industry leaders...*
- *truly enjoyed the professional moments... abundance of ideas exchanged... and new friends...*
- *truly rewarding experience and exposure... enjoyed the knowledge sharing sessions...*
- *enjoyed every moment of this course... learnt a lot...*
- *CTPR Master Class provides me an avenue to gain knowledge, share ideas, create networks and had good exposure on functions of regulator...*
- *had a wonderful enjoying session throughout... hope to join such courses in the future...*
- *a great 3 weeks, very fruitful training with interactive sessions... made many new friends... include more international participants...*
- *very grateful to be selected as a participant... valuable knowledge gained... excellent coordination from the organiser...*
- *found this course outstanding... academic materials are very comprehensive and topics are relevant...*
- *Great programme which gathers telcos, ministry & regulatory in one room... wonderful 3 weeks...*
- *CTPR course really expose us to the revolution of technology... really helps us understand the pain points within telcos & celcos... how we can work as one to face future technology... OTT, net neutrality. to build nation...*
- *looking forward to follow-up CTPR 2.0...*
- *too packed-until 7.30pm for 3 weeks was too tiring... the topics covered were good and relevant for this course...*
- *boot camp for the mind... but it was worth it... thank you CTPR family!*



The Impossible Green Data Centre

Malaysian Green Data Centre LLP wins multiple global accolades for its liquid cooled green data centre solution.

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Data Centres, a critical infrastructure of the internet, are where companies maintain and operate their ICT infrastructure. While some data centres can be found housed in an organisation's building, most data centres are usually located at strategic locations around the world near power grids and high-speed telecommunications infrastructure.

With the world increasingly going digital, the number and size of data centres have been growing exponentially. Facebook, for example, has many data centres around the world. Every one of these data centres is huge, housing thousands of computer servers each and requiring extensive power supply systems, myriads of cooling systems and networking connections. Bearing these in mind, it is not surprising then that data centres are

not environmentally friendly. In fact, data centres are contributing to 3% of the world's greenhouse gases.

With climate change becoming such a major problem, the ICT world is being challenged to transform itself into a sustainable industry with a neutral impact on the environment. Globally, companies and governments are searching for green data centre solutions and one highly rated solution that has attracted worldwide attention was created by a Malaysian.

The Green Data Center LLP's Eco2 data centre cooling technology has won prestigious international IT awards. It is reimagining what a data centre looks like. Its liquid cooled green data centre solution dramatically reduces the carbon footprint as it uses biodegradable and renewable coolant technology. Matthew Rajendra, CEO Green Data Centre LLP, describes it as the 'Impossible

Data Centre'. He says that Green Data Centre LLP was founded under the belief that current data centre technology is destroying the environment, expensive and unreliable. He wanted to create data centres that are energy rational, low cost and ultra-dependable and up until the Green Data Centre LLP came along, such a data centre was described as the 'Impossible Data Centre'.

technology Kickstarter for his venture. He began to work on his idea in 2010 and on his own steam he was able to build a working prototype. However, without the support of MCMC and MTSFB, his idea may have never reached commercial stage. The GICT grant funded his proof of concept and from that point onwards his venture took off.



Dato' Jailani viewing the Eco2 at the 11th ITU Symposium on ICT, the Environment and Climate Change, 21 April 2016, Kuala Lumpur, Malaysia

WORLDWIDE RECOGNITION

Winning one award is usually a great achievement. On that scale, Green Data Center LLP is a superstar as within a short time span it has won a string of global awards. First, Green Data Centre LLP picked up 3 awards from APICTA in 2015. At the national level, it won the MSC APICTA Winner award for Best of Sustainability & Environmental Technology 2015 as well as the MSC APICTA Silver award for Best of Startup Companies 2015. At the Asian level, Green Data Centre LLP was the International APICTA Winner award for Best of Sustainability & Environmental Technology 2015.

Green Data Centre LLP then went on to win two other prestigious global recognitions. It picked up the WITSA Global ICT Excellence Awards - Chairman's Award 2016, which was handed out this year in Brazil. It was also honoured in Geneva, where it won the United Nations ITU WSIS Award for E-Environment 2016.

NURTURING A GREEN ICT SOLUTIONS INDUSTRY

Green Data Centre LLP's solution was brought to reality through the support of Malaysian Communications and Multimedia Commission (MCMC) and Malaysian Technical Standards Forum Bhd (MTSFB). Mindful of the need to promote sustainable ICT solutions, MCMC has been at the forefront of the search for green ICT solutions. In 2012, the Industry Promotion and Development Grant for Green ICT was introduced to spur the development and adoption of Green ICT solutions within the field of communications network and infrastructure.

These grants, of which Green Data Center LLP was one of the recipients, are provided to registered members of MTSFB and specifically, members of its Green ICT Working Group (GICT WG).

Some other projects that received grants are as follows:

1. Telecommunication Equipment Baseline Study;
2. Typical Government Data Center Baseline Study;
3. Sahabat Hijau Mobile Apps;
4. Hybrid Hydrogen Fuel Cell and Solar PV Off-Grid System;
5. Vehicle Diagnostic and Monitoring System (VDMS).

The grants have made a significant impact. Matthew says that he is grateful for the assistance from MCMC because it enabled him to take his project from concept to commercial stage. According to him, MCMC was the

THE 'IMPOSSIBLE' DATA CENTRE'

The solution created by Green Data Centre LLP addresses all the problems currently faced by data centres. Today's data centres have numerous financial, technical and environmental challenges. At the core is the fact that a large portion of the power used at data centres are for cooling purposes. Server equipment must be kept very cool or they will overheat and break down. Green Data Centre LLP solves this problem using biodegradable and renewable coolant technology.

Green Data Centre LLP's solution makes financial sense. It takes a lot of money to build, deploy and operate regular data centres. The green data centre can be built and deployed with a 70% lower capital expenses. These data centres also have 50% lower operating expenses. The total cost of ownership is thus lowered by 76%, cutting the payback period to just 24 months.

Technically, current data centres require large land space and take very long to build. On top of that, if the cooling system fails, operators have to respond within eight minutes or the servers will break down. Coupled



Servers operating with Eco2

coolant in which PCs can run. Servers and related equipment are literally submerged and operate inside tanks filled with this coolant. The coolant is so safe that one can even put one's hand into the coolant while the server is running and there would be no electric shock.

Their 6 feet by 3 feet tanks are filled with a thousand litres of the coolant with servers, firewalls, routers and so on placed sideways into the coolant. The equipment are completely submerged and operate inside these tanks. The heat generated by the servers transfers to the coolant. The Eco2 coolant is 1,356 times more efficient than air cooling. The coolant flows to a radiator like device that cools it again and the coolant is then piped back to the tank.

with dust accumulation issues, these data centres currently have high server failure rates. The green data centre addresses this area as well. It is constructed in a space saving multi-level pod format. Unlike traditional data centres, the Eco2 green data centres do not require raised floors or other fancy construction. Matthew says that his green data centre requires nothing more than basic warehouse space. They can even be housed inside containers. These green data centres are thus 80% faster to build and deploy. Matthew says that his green data centres have 30% fewer server failures and in the unlikely case of a cooling failure, technicians have up to 8 hours to respond. The environment is also dust free.

The environmental impact of current data centres is staggering. As mentioned, they have high carbon footprints and it is therefore difficult for them to conform to sustainability regulations. There is also unused waste heat and excessive noise pollution. The sound generated by all the equipment running at the same time can cause tinnitus to workers. Matthew says that his Eco2 data centre cooling technology takes up 50% less carbon footprint. The coolant used is sustainable, renewable and biodegradable and safe for humans. The environment is noise free as the servers operate inside the coolant. The waste heat generated is reusable.

So how does all this magic happen? The answer is fluid submersion technology. Matthew's company takes air out of the equation. Air is inefficient because it is a poor heat conductor. Green Data Centre LLP has created coolant liquid that is safe and does not conduct electricity. Amazingly, Green Data Centre LLP has created liquid


GOING GLOBAL

The first green data centre built by Green Data Centre LLP was completed in 2014. This customer reference site was a 354 KW data centre. The second customer came in 2015 when Green Data Centre LLP was commissioned to



Matthew Rajendra, CEO of Green Data Centre LLP and Badaruzzaman Mat Nor, Head of Technology Development Department, MCMC with awards won by Green Data Centre LLP

build a 6,372 KW site. The third site which is a 17,600 KW site is currently being built.

Green Data Centre LLP is now ready for the global market. By December 2016, they will open their Americas office in Silicon Valley, California. The Europe office will also open in London. But the company will remain proudly Malaysian as manufacturing will remain here. Matthew says that their technology is leaps ahead of the alternatives. "Our solution is exponentially a better technology. It is many times better than any other solution" and because of that, he is confident that Green Data Centre LLP will do very well globally. 



Hybrid Power Systems for Remote Telecommunication

Install and forget hybrid power systems may be ideal solutions for remote telecommunications base stations.

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Currently most off-grid telecom base stations are powered by diesel generators operating in conjunction with batteries. There are issues with such systems. Diesel generators need extensive servicing, and in situations where the base stations are in remote locations, costs and CO₂ production rise dramatically due to the transportation costs of regular maintenance and fuel supply. Diesel generators and lead acid batteries suffer from high levels of pilferage and theft. The diesel generators also create a significant amount of noise pollution and copious amount of CO₂ pollution when in operation. In brief, the deployment of these generators results in very high operational and environmental costs.

A CLEANER SOLUTION

There is an alternative solution which uses a combination of alternative technologies that have been integrated together. It would have no carbon footprint, requires no

refuelling, very little maintenance and it exploits the availability of renewable resources in Malaysia.

The proposed solution is based on a hydrogen-powered fuel cell, which is self-refuelling through the onsite production of hydrogen using an electrolyser, which uses water extracted by an atmospheric water generator.

A proof of concept installation was recently done to demonstrate the suitability for this application and to confirm and demonstrate the main benefits, which are significantly lower operational costs, less CO₂ production and reduced noise pollution. A drastic reduction of site visits to 1-2 per annum was achieved with this design. There were also improvements in higher overall service levels compared to existing systems. It also achieved a reduction in noise and carbon emission both at site as well as on transit pathways. Lastly, it reduced the occurrences of pilfering incidents as the fuel used is water instead of diesel.

BACKGROUND

Hydrogen fuel cell technology has grown very fast in the past few years as an alternative green technology. Fuel cells have been applied successfully in many areas that require an uninterrupted power supply as well as primary energy sources. The growth in energy consumption globally necessitates urgent sources of renewable, green, and quality power supplies. Fuel cells technology is a real contender to fill this gap. The application of hydrogen fuel cells in Malaysia is currently limited to mainly R&D projects by various institutions.

There are five major types of fuel cells. They are differentiated from one another by their electrolytes:

1. Phosphoric acid fuel cell (PAFC);
2. Polymer electrolyte membrane fuel cell (PEMFC);
3. Alkaline fuel cell (AFC);
4. Molten carbonate fuel cell (MCFC); and
5. Solid-oxide fuel cell (SOFC).

While all these types of fuel cells are based on the same underlying electrochemical principle, they are operating at different temperature regimens, incorporate different materials and have different characteristics and performance. For this installation, PEMFC has been used as it operates at low temperatures and has high power density.

Proton exchange membrane fuel cells, also known as PEMFC, are a type of fuel cell being developed for transport applications as well as for stationary and portable fuel cell applications. Their distinguishing features include lower temperature or pressure ranges (50°C to 100°C) and a special polymer electrolyte membrane.

A proton exchange membrane fuel cell transforms the chemical energy liberated during the electrochemical reaction of hydrogen and oxygen to electrical energy, as opposed to the direct combustion of hydrogen and oxygen gases to produce thermal energy. A stream of hydrogen is delivered to the anode side of the Membrane Electrode Assembly (MEA) where it is catalytically split into

protons and electrons. This oxidation half-cell reaction or hydrogen oxidation reaction (HOR) is represented by the following reaction.



The newly formed protons permeate through the polymer electrolyte membrane to the cathode side. The electrons travel along an external load circuit to the cathode side of the MEA, thus creating the current output of the fuel cell. Meanwhile, a stream of oxygen is delivered to the cathode side of the MEA. At the cathode side oxygen molecules react with the protons permeating through the polymer electrolyte membrane and the electrons arriving through the external circuit to form water molecules.

The reversible reaction is expressed in the equation and shows the reincorporation of the hydrogen protons and electrons together with the oxygen molecule and the formation of one water molecule. The potentials in each case are given with respect to the standard hydrogen electrode.

A stream of hydrogen is delivered to the anode side of the MEA. At the anode side it is catalytically split into protons and electrons. This oxidation half-cell reaction or hydrogen oxidation reaction (HOR) is represented by:

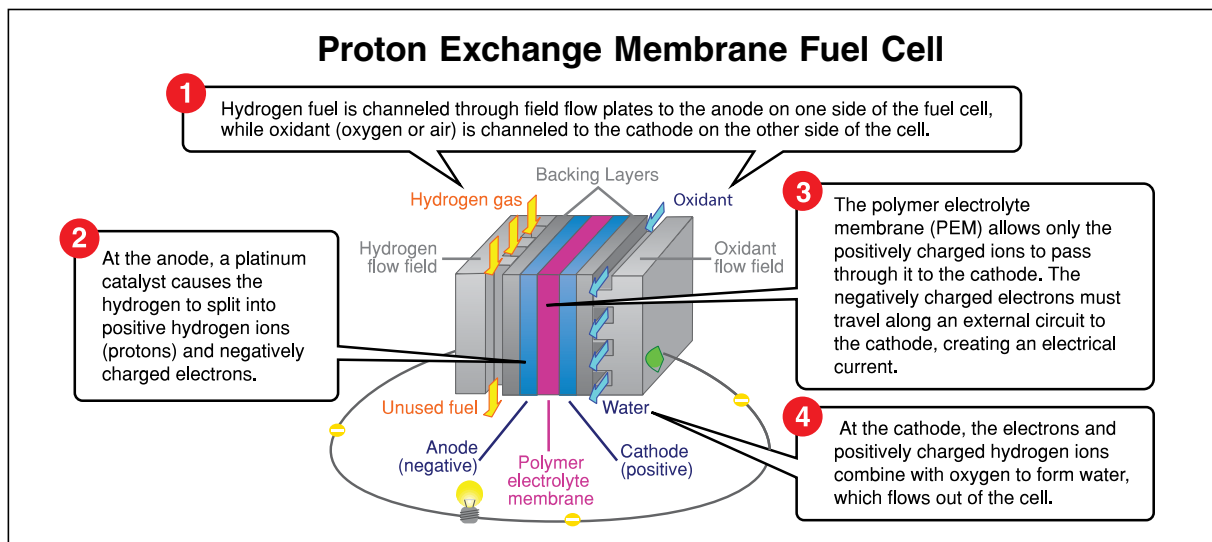
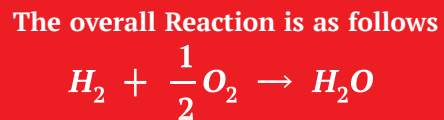
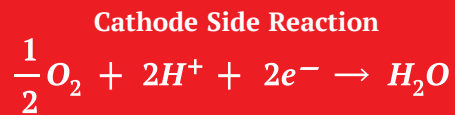


Figure 1: Bipolar plate for PEM fuel cell

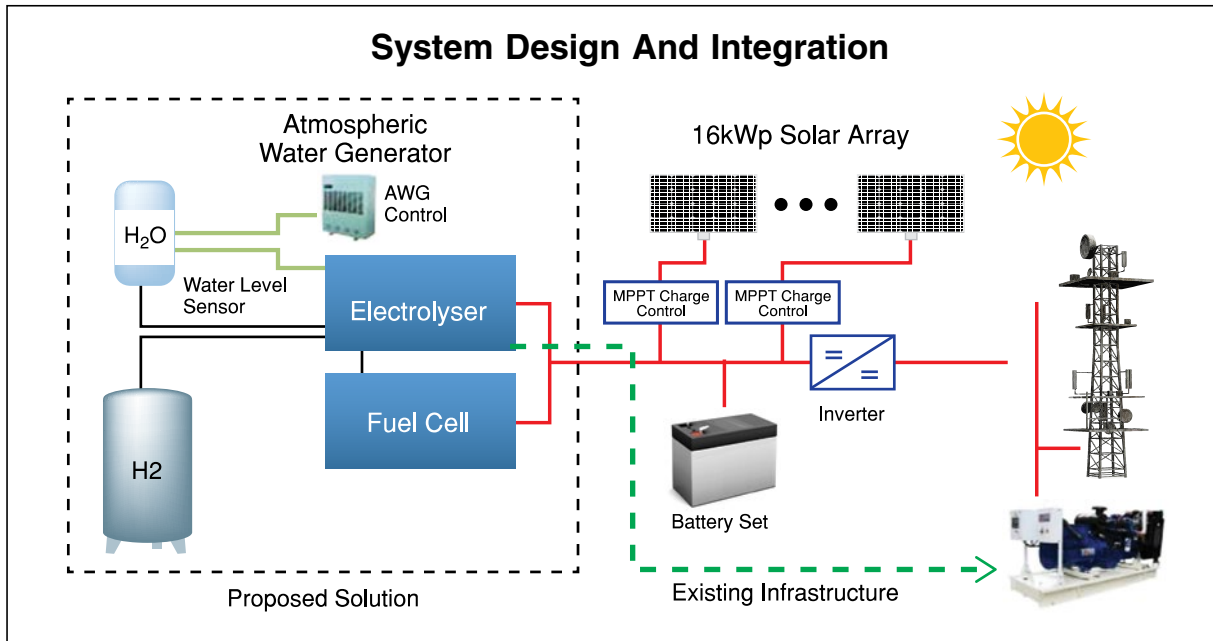


Figure 2: System operation

Self-recharging Energy System (SES) is a complete power and energy storage solution designed for off-grid or renewable powered sites. It includes solar photovoltaic (PV), batteries, fuel cell, electrolyser and a hydrogen storage system. The system is incrementally upgradeable, with additional cabinets in parallel, up to N+1 capability.

The hydrogen production component is based on a patented electrolytic process using electrolyser which produces pure dry hydrogen at 30 bar pressure. The process is safe and highly efficient (65% - 70% efficiencies possible) and only requires distilled water, which can include rainwater with appropriate filtration system installed. Water can be obtained using an atmospheric water generator (AWG) option which produces water automatically through a humidification process.

The SES can operate under two scenarios either as a replacement for onsite batteries and/or generator in grid based sites, or completely off-grid sites where the power for hydrogen production is available through renewables such as solar, wind, etc.

In the case of this project, the scope of work is to provide a stable and completely independent, telecom grade power on a 24x7 basis with a 95% service level.

The SES system has three working modes, namely;

1. Hydrogen production mode - when there is grid power/renewable power available and SES generates and stores hydrogen;
2. Standby mode - when the hydrogen storage is full and the equipment only standby; and
3. Power mode - steps in when there is an outage. The fuel cell activates and provides power using the hydrogen already stored.

The SES solution is a complete system that provides autonomous primary power in an off-grid environment. In general, other renewable energy options tend to have 'variable' benefits as primary sources of power. In many cases, there is no power when you need it, or too much at the wrong time. On the other hand, batteries may be efficient at storing energy but are an expensive energy store when one considers the cost and charging efficiency. The SES is designed to address these issues as it can collect hydrogen during the times of the day when energy production is low, thus maximising all the renewable efficiency available.

The hydrogen stored is used to produce electricity during periods in which the available energy from renewables is available in quantities less than the needs of the load. There is no limit to the amount of hydrogen that can be produced and any excess not required for the application can be used for other AC or DC powered applications.

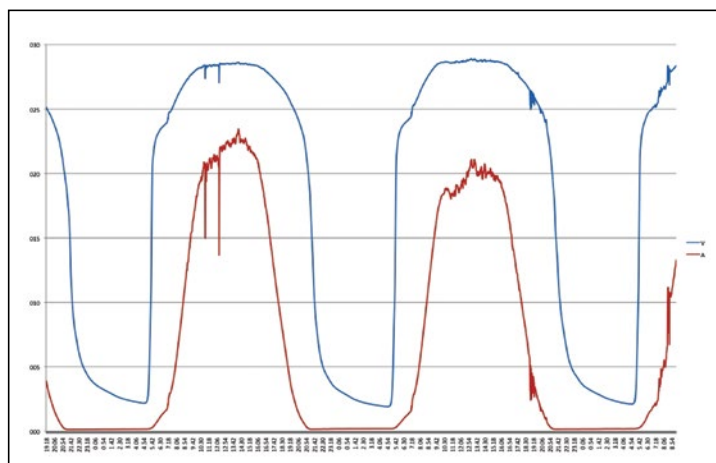


Figure 3: Solar PV Power (Blue) and Hydrogen Production (Red)

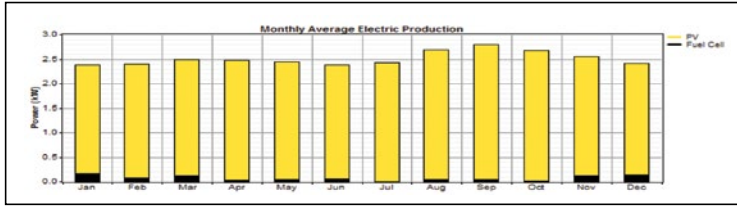


Figure 4: Solar PV and Fuel Cell Power

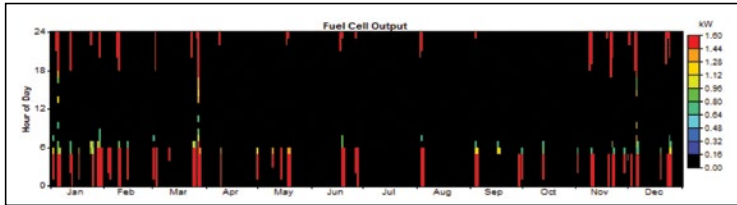


Figure 5: Fuel Cell Power

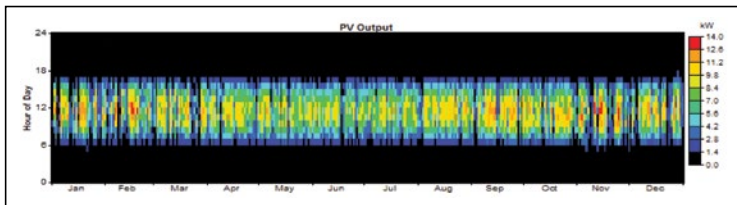


Figure 6: PV Power

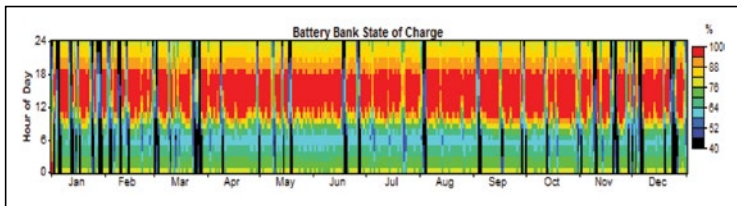


Figure 7: Battery State of Charge

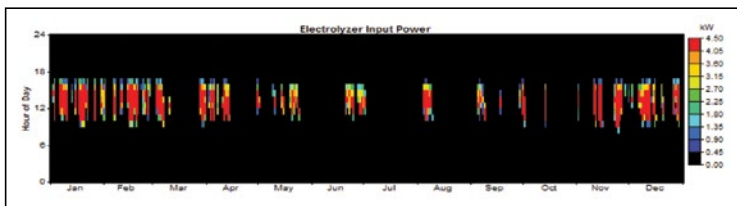


Figure 8: Electrolyser Power

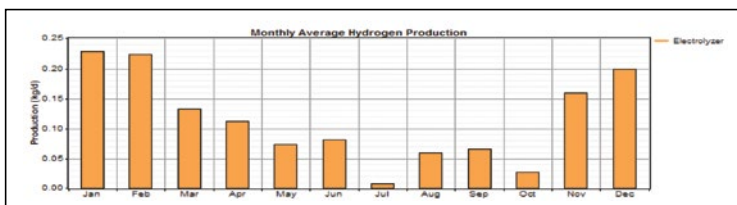


Figure 9: Hydrogen Production

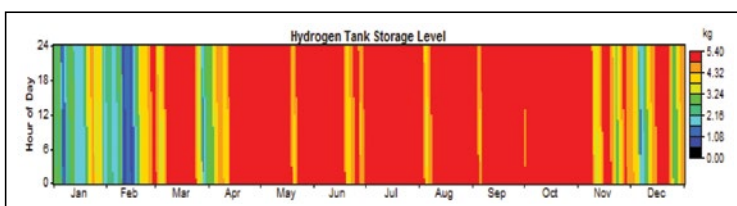


Figure 10: Hydrogen Storage Level

When setting up the SES solution, the average monthly solar production and excess power available over the load (e.g. base station equipment) and battery recharge is calculated. Relatively small energy from the excess of the load is needed to start H2 production. The priority in power management is to provide power to the load and secondly to produce hydrogen.

The solar PV power input and renewable energy stored will share the load as follows: 80% of the solar PV will be used to manage the load and 20% to produce Hydrogen. The system will produce 1.2 litres of 'spare' hydrogen on an average day. Hydrogen production will consume 360 litres of water per year. Water generation and refill of the water tank on site is performed automatically by the AWG which uses less than 1.5% of the total available energy produced.

The SES solution will run the 1.5 kW load round the clock and it will be able to run the site with no solar input for 4 days (48 hours) continuously. This can be extended by adding additional cylinders (each 1 litre cylinder adds an additional 42 kW hour autonomy).

POTENTIAL USERS AND BENEFITS

Future end users of such a system would be firstly telecommunication companies looking for alternative and greener energy solutions for backup power or primary power in a rural setting. In a decentralised grid, a multiple of these standalone systems could make up a smart-grid. With advancements in Internet of Things (IOT), each micro-grid (SES systems) could communicate with one another to form a network.

There are many benefits to this type of network. It is less vulnerable to blackouts, brownouts and there is reduced dependency on power plants. SES is also ideal for longhouses or island electrification, where the hydrogen could be used as cooking gas in addition to generating electricity.

Government healthcare centres and remote school are potential users; with the added benefit of educating students on renewable energy sources. SES solution being a self-sustaining energy and storage system could provide unlimited power to sensitive equipment like military or armed

forces communication antennae, critical base stations and naval applications. SES solution could potentially power any remote or sensitive equipment such as sensors and telemetry with transmitter like seismic sensors, railroad, water, and surveillance camera.

Environmental benefits include reducing adverse impact on the environment by providing a zero emissions system that would replace highly polluting and noisy diesel generators. The proposed solution will save over fourteen tonnes of carbon per year. Technically it offers the most advanced and reliable power systems globally with one of the highest efficiency of any technology on the market today. Economically it will result in a great reduction in operating expenses and theft incidents.

This project will allow our government to showcase a green technology system that is sustainable and with a lower total cost of ownership in the long run. This showcase will provide academicians an opportunity to study the use of renewable based systems in operation.

Telecom Backup Power Technology Comparison Fuel Cell Systems vs. Diesel Generator

	Fuel Cell with Electrolyser	Diesel Generator
Exhaust Emissions ^{1,2}		
Nitrogen Oxides (NOx)	0.0 g/kWh	7.5 g/kWh
Carbon Monoxide (CO)	0.0 g/kWh	8.0 g/kWh
Sulfur Oxides (Sox)	0 g/kWh	12.0 g/kWh
Particulate Matter	0 g/kWh	0.8 g/kWh
Carbon Dioxide (CO2)	00 g/kWh	1,500 g/kWh
Noise Emissions ³		
Decibel rating	Quiet : 50 dB at 1 m 40 dB at 7M	Loud: 58 dB at 7 m
System Efficiency		
System Efficiency (%)	+50%	10 - 25%
Operational Costs		
Maintenance (visits per year)	1	1
Theft Costs (Fuel, parts)	None	Fuel & Parts
Reliability	Few moving parts	Many moving parts

Note 2: Diesel generator emissions data from EPA standards for 2007 and newer generators, EPA Standards of Performance for Stationary Compression Ignition Internal Combustion Engines; Final Rule July 11, 2006

Table 1: Comparison of Fuel cell with Electrolyser vs. Diesel Generator



PROOF-OF-CONCEPT

The idea of Proof-of-Concept (POC) for self-refilling energy system (SES) was conceived by Green-ICT Working Group of Malaysian Technical Standards Forum Bhd (MTSFB) and sponsored by MCMC.

Some criteria were required for a successful implementation of POC, such as zero shading factor on site for the solar PV modules. An area exceeding 130 square metres was needed to accommodate the PV

modules and structures. The site had to be accessible by car or four-wheel drive, with a maximum of 6-hour drive from Kuala Lumpur or 1-hour drive from any domestic airport. It was essential for the selected site to have 3G, EDGE or GPRS base station.

After much deliberation and various site surveys, Digi Telecommunication's site at Kampung Sg. Terap near Rompin Town was chosen as the POC site. On December 2015, the POC was successfully installed for testing and commissioning.



THE OFFICIAL LAUNCH

On 7th April 2016, Solar NRJ Sdn Bhd (SolarNRJ) commercially launched the self-refuelling energy (SES) system, making it Asia's first solar hydrogen hybrid power solution for telecommunication base station towers.

During the launch event, representatives from MCMC, Ministry of Energy, Green Technology and Water (KETTHA), MTSFB Green-ICT Working Group, Technology Park Malaysia (TPM), DiGi, CNX Construction and press representatives were present.

The guest of honour was Dato' Mohd Ali Hanafiah Mohd Yunus, Chief Officer, Communications and Digital Ecosystem Sector, MCMC. The MTSFB Chairman, Dato' Ismail Osman and Paul Low from the Ministry of Energy, Green Technology and Water were also present.

Joseph Koh, Technical Director of Solar NRJ Sdn. Bhd. told the press that he was delighted to have completed the project within the specified time frame to demonstrate how a combination of clean energy technologies can effectively work together to provide a green, long-term, cost-effective solution for remote power.

Alex Kuik, the Chairman of the Industry's Green ICT Solutions sub-working group of MTSFB said that the WG will be evaluating the system over the next few months and will fine-tune the system to achieve optimum performance together with SolarNRJ.

DATA ANALYSIS AND SYSTEM EVALUATION

Data from the Supervisory Control and Data Acquisition (SCADA) system shows the performance for each section/array of the solar system. The capacity of the solar

PV system that was installed at each array is 4kWp (total 16kWp @ 4 arrays). The solar PV power for each section is reliant on the state of charge (SoC) of the batteries.

On the first and second day of operation, the state of charge of the batteries was near zero, caused by some testing that was done to discharge the batteries completely. The system however quickly recharged the battery to 100% within one day.

On the 4th and 5th day, the electrolyser started to produce hydrogen with excess energy from the solar PV array. From empty, the hydrogen tank pressure was filled to capacity in just 2 days. When the solar PV SoC was less than 30%, the fuel cell turned "ON" in backup mode to supply power to the base station equipment. The fuel cell was "ON" for just a couple of hours only since the solar PV battery bank SoC went up very quickly to 80% with good sun light availability at site. During periods of good sun light availability the solar PV power is higher compared to other days (average 3kW for each section/array) and the battery bank recharges quickly even though the SoC went below 60% and the solar PV power



The SES' components

just consumed was at an average of 3kW for each section although the maximum it can supply is 4kW.

For the rest of the days, the solar PV power was lower but held consistent at an average of 1.5kW for each section/array because the SoC of battery never dropped below 60%. The performances of the four solar PV arrays differ slightly because of factors such as orientation of PV modules (2 sides) and the shading factor from the tower itself.

The system is operational to date and provides uninterrupted power with no outages so far. The solar PV production is in excess currently which means the fuel cell system has not been called into operation. The installer foresees that during the rainy season, the SoC will drop more drastically bringing the stored hydrogen of the fuel cell system into use.

CONCLUSION

The benefit of SES is clear. However, the high capex could be a potential deal breaker. By studying the results of the POC, optimisation and reduction of the installed capacity of solar PV, batteries, electrolyser and fuel cell can be done and cost optimised. The system appears to be viable and sustainable as a replacement for diesel generator powered sites in the long run despite having a very high start-up cost. With optimised designs and production costs, this system could potentially become competitive as an alternative power solution for remote telecommunications base stations.

The potential for SES is not only in the local market but in this region. There could be a market in developing countries such as Myanmar where diesel generator sets

are more commonly used for telecommunications services deployment as well as in Australia where remote power for critical loads is much required. [myV](#)

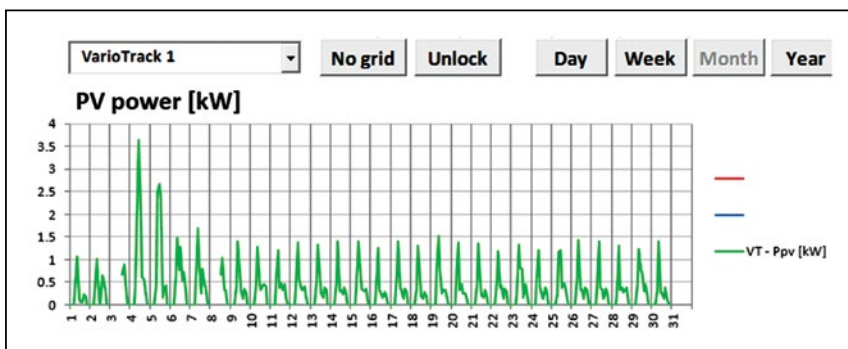


Figure 11: Daily PV Power for Array 1

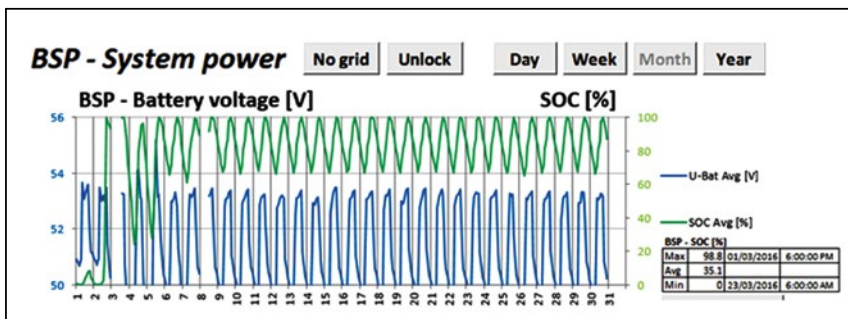


Figure 12: Daily State of Charge for Battery Bank

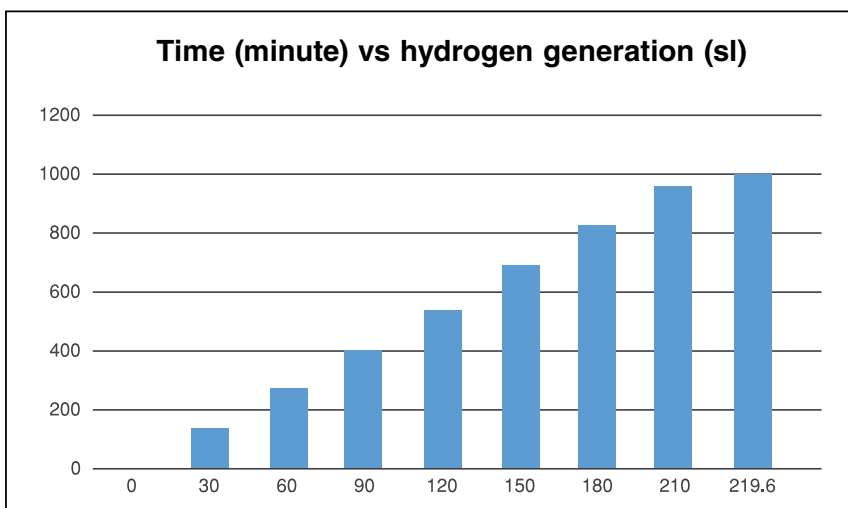


Figure 13: Time (minute) vs hydrogen generation (sl)

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RTM: 70 Years Together With The Nation

RTM has been documenting the tears and joys of a nation for seven decades now.

[.myConvergence](#)

There have been many changes at Radio Television Malaysia (RTM) from the time radio and later TV technologies arrived in Malaysia till today. Every aspect of the production and transmission process have changed over the 70 years RTM has been around. And now the internet and its accompanying new media have brought the latest and probably the biggest challenges thus far.

.myConvergence sat down recently with some senior leaders from RTM. They shared their memories of the changes that have occurred over the years as well as the transformation agenda moving forward. Present at the interview were Dato' Adilah Shek Omar, Deputy Director General (Strategic); Dato' Haji Wan Bukhari bin Wan Daud, Director, Current Affairs News; Mr Magli Alias, Director of Broadcast Centre and Multichannel Networks; Ms Noriah Letuar, Deputy Director of TV

Program (Production) and Ms Noriani Mohd Idris, Manager, Traxxfm.

Since all of them joined RTM in the eighties or later, information for the years before that was sourced from the 'RTM Merentas Zaman' coffee table book prepared by RTM a few years ago and the internet.

THE BEGINNING

The first radio set was brought here in 1921 by AC Birch, an engineer based in Johor. The Wireless Association of Johor was formed in 1923 and it started brief radio transmissions on the 300 metres wavelength followed by Singapore Wireless Association in 1924 and Penang in 1925. The Malaya Wireless Association was formed in 1928. By 1930, radio transmissions were made three times a day from Bukit Petaling on the 325 metres band.

The first actual radio licence was issued on 24 August 1934 for the Penang Wireless Association in the name of Khoo Sian Ewe. Its station was called Station ZHJ and it transmitted daily in Malay, Chinese, English and Tamil every day from 7 pm to 10 pm.

The British Malaya Broadcasting Corp (BMBC) was set up on 1 March 1937. It transmitted from Bukit Caldecott in Jalan Thomson, Singapore. Sabah meanwhile started radio transmissions in 1940. BMBC was taken over by the Straits Settlements government and renamed Malaya Broadcasting Corporation (MBC). By then, it had transmissions in English, Malay, Tamil, Hindi, Urdu, French and Dutch languages.

MBC stopped transmissions when the Japanese occupied Malaya during the Second World War. The Japanese army used the radio infrastructure to broadcast their propaganda over the duration of the war. When the British regained control of Malaya, radio transmission was under the British Army which used to start transmissions with the words, "This is the British Military Administration of Malaya." Transmissions were twice daily; from 1 pm to 2 pm and 8.15 pm to 11 pm.



L-R: Noriah Letuar, Magli Alias, Dato' Adilah Shek Omar, Noriani Mohd Idris, Dato' Haji Wan Bukhari bin Wan Daud.

Later, when the civilian government took over, the words were changed to, "This is Radio Malaya". At the same period, radio corporations were also transmitting in Sarawak (1954) and Sabah (1955). Radio was an important tool used by the Malayan government during the Malaysian Emergency. It was able to effectively share information across the nation.

By the 1950s, broadcasting activities had moved to Kuala Lumpur; first from a temporary studio in Jalan Young (now known as Jalan Cenderasari) and later in 1956, from Federal House, Kuala Lumpur.

RTM shared the joy of independence when it broadcast the declaration of independence live on 31 August 1957. And when Malaysia was formed in 1963, the radio switched its introduction to "Inilah Radio Malaysia (This is Radio Malaysia)".

A NATION'S COMPANION

Television services started in 1963. Radio and TV operations merged in 1968 when the iconic Angkasapuri headquarters along the Federal Highway was opened. RTM came into being in 1969 with the formation of Jabatan Penyiaran Malaysia. Expansion was rapid with the second TV station opening the same year and Radio Malaysia starting 24 hours broadcasts in 1971. RTM began broadcasting in colour since 1978 in Peninsula Malaysia and 1980 in Sabah and Sarawak.

All over those years, other than news, it also provided entertainment. As early as 1953, it had formed the Orkes Radio Malaya led by the legendary Alfonso Soliano. Household stars had their first breaks at RTM. Tan Sri P. Ramlee won Bintang Radio competitions in Penang in the late 40s. In 1952, three entertainers who later achieved great successes took the top 3 spots in the Bintang Radio competition in Singapore. They were Tan Sri P. Ramlee, Tan Sri S. M. Salim and R. Azmi. The show later became Bintang RTM which in one form or the other lasted over 30 years and made many entertainers successful. Singers such as Dato' Sudirman Haji Arshad, Jamal Abdillah, Aznil Nawawi and Ramlah Ram among many others got their big breaks in this show.

In the 80s, the show was replaced with shows like 'Bintang HMI', 'Suara 90'an', 'Golden Teen Search', 'Bintang Gala 2', and 'Teen Star' RTM continued to churn out stars such as Datuk Siti Nurhaliza, Nora, Liza Hanim, Dayang Nurfaizah, Candy Cheah, Nur Fatimah, Dia Fadila, Carol Oormila and Mas Idayu.

In the 60s and 70s, RTM remained the sole provider of radio and TV

content in Malaysia. Its programs covered everything. It provided entertainment in the form of comedies, dramas, religious programs, music and sports. A nation rejoiced when it showed the live telecasts of the Thomas Cup Final in the 60s.

RTM also produced and aired dramas like Empat Sekawan which brilliantly mirrored social issues in those times. Malaysians also had their many doses of Malay movies, especially the ones featuring Tan Sri P. Ramlee over RTM TV.

The 80s brought competition to the industry as private radio stations and TV stations arrived. In the nineties, pay TV brought even more competition. By then too, the internet had started to disrupt the industry. Since then, RTM has had to function in an industry that is facing severe disruption from many directions.

FROM ANALOGUE TO DIGITAL

It would be no surprise to anyone that just about every aspect of the TV and radio production and broadcast process has changed over time. The people who worked at RTM in the 50s to the 70s are gone. They used the earliest systems of radio and TV production and those systems have also been replaced over the years.



Mobile recording studio in the 1970s

The management that we spoke to in the interview experienced the transition. Wan Bukhari, who started working in the early 80s said that back then, the digital age had not arrived. Material was still shot using 16 mm films. The huge old Thomson cameras that made a lot of noise when filming were being replaced with U-Matic video recording cassettes. These were later replaced by Beta tapes. Of course, by now the recording of news has evolved to a digital server system.

In the 80s news writers were still actually typing out the news. Teleprinters which typed out text sent using telegram technology were still in use. The production of graphics used for news shows was still very manual. The staff had to go into the studio and manually cut and put together the graphics which accompanied the news. Today, the process has become completely digital. A WASP digital editing solution is in place and everything can be sent direct from the computer to studio. Studios which were analogue became digital about five years ago.

News journalism has also rapidly changed. The process of dispatching material from regional centres in the 80s was dependent on buses and taxis. At that time it was mostly a 24 hours news cycle. Events covered by the TV crew outside Kuala Lumpur were broadcast the next day because they had to be sent through buses and taxis to the production studio. When RTM staff went overseas, the challenges were immense. The team would have to book uplink slots at local TV stations there to send material to the headquarters.

Large trucks filled with equipment were needed in the 80s when events were being covered. Today, two state of the art technologies are used. Vans are equipped with DSNGS systems (Digital Satellite News Gathering System). Similar video news gathering systems have also been placed in all states. These systems can send material direct to Angkasapuri through dedicated IP lines that are sourced from Telekom Malaysia.

In addition to that system, RTM also has MOJO (Mobile Journalist) systems at its disposal for fast breaking news types of events. There are four such mobile systems. News journalists can carry these backpack systems and can shoot footage and send them across easily. Mojo systems have eight slots for SIM cards. The system will detect which signal strengths are strong and send the videos over using combinations of these lines.

No feature on RTM would be complete without mention of the Tun Abdul Razak Institute of Broadcasting (IPPTAR). The training centre was founded in 1971 and since then it has grown to become an internationally renowned training centre for the broadcasting industry. It has trained and developed the skills of RTM staff all these years.

Another event that took RTM to a new level of technical excellence was the hosting of the Commonwealth Games in 1998. It gave RTM the opportunity to handle an international class sporting event with multiple live telecasts and intensive coverage.

In short, everything has gone digital save for the transmission portion. RTM is ready as Malaysia is due to switch to digital TV in the near future with the service provided by a separate company that has been awarded the project. RTM would only be supplying content through its various channels.



A news show in progress

THE LOYAL COMPANION OF MALAYSIANS

RTM has strived to be the companion of Malaysians and it has fulfilled its mandate. Dato' Adilah said that "RTM's agenda has always been about nation building. It has always put its focus on providing information and knowledge to its viewers and listeners. Even on radio, 60% of our content is information, not music."



Today, it can point to the fact that it has something for everyone. RTM has special segments and channels for all the people in Malaysia. It has programmes for all four Orang Asli languages. All languages and dialects in Sabah and Sarawak are also given airtime. There are also regional stations in Sarawak, Langkawi, Kuala Lumpur and Labuan.

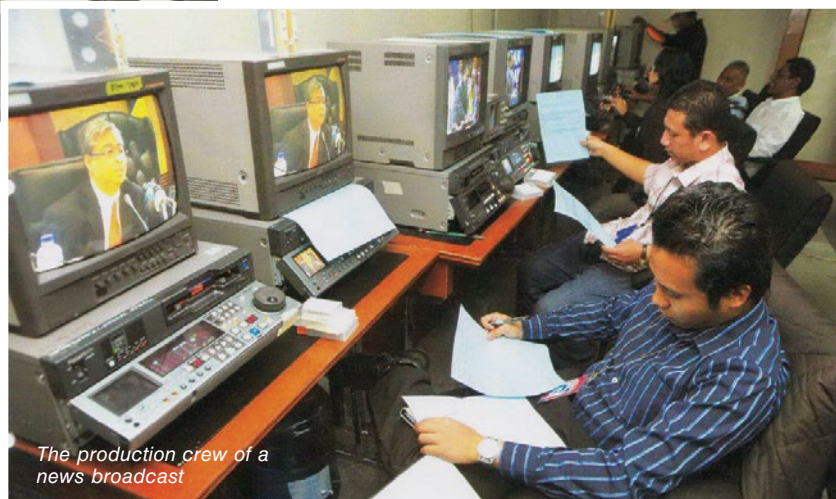
The number of staff at RTM has grown simply because it produces so much variety and diversity in its content now. It is a round the clock enterprise now. Dato' Adilah says that more than 4,000 people work at RTM currently. From just one radio channel and one TV channel it has expanded enormously. RTM also produces so much more of its own content these days. Take news for example. There used to be just two news bulletins some decades ago. Today, there is news every hour. The length of the news has also grown from just 15 minutes previously. In addition to that, the news shows have so much variety, not just the straight reading of the news. On top of that, there are talk shows and news programs like Selamat Pagi Malaysia.

What has not changed, according to Dato' Adilah is the spirit that drives the staff. "Rain or shine, no matter the hazards and challenges, RTM produced the content and it still does so. We had no overtime back then but that did not matter." She added that "it was important that the staff maintains this same spirit to face the challenges going forward and also be prepared for the

coming transformation. Since transformation starts with people, the staff has to embrace transformation."

Dato' Adilah said that RTM is transforming to face the challenges of the time. "It is not that we have been sitting still. We already are in all the new media channels. RTM launched its first website back in 1996. Today it has everything. We have a news portal, we are on IPTV and we have catchup TV. RTM is also on YouTube. We offer streaming of radio and TV on mobile and other devices. We are also active on social media. The only thing is that perhaps our efforts are scattered all over. We are now bringing everything together and we are looking at setting up a new division to handle new media."

Physical transformation is also coming. Mr Magli said that "Angkasapuri will soon be transformed. The MediaCity project which will rise by 2020 will address every area and aspect. Under Phase 1 which will take 12 months, the current equipment will be replaced. The focus of Phase 1 will be on news production. There will be new outside broadcasting vans, news automation centres and the transmission centre will also be upgraded."



Mr Magli added that Phase 2 will see studios being completely upgraded. Studios 1, 2 and 4 will have HD systems installed. The radio studio which is 15 years old will also be upgraded. Another area that will be upgraded under this phase is the production of graphics.

Phase 3 will be the centerpiece of this transformation. The 17-floor Mediacity tower will be built over three years. There will be three new studios, an auditorium, a music studio, a warehouse for props, a recreation centre and a nursery. A new arch will also be built at the entrance too. The new Transmission Operation Centre will be capable of delivering up to 10 HD channels. For a start, RTM plans to launch four new channels that include news, lifestyle and children's channels. All iconic building such as the office block visible from the Federal Highway and Wisma Radio will remain.

With all these changes coming soon, Dato' Adilah and the rest of the management team we spoke to are confident that RTM will be able to continue its mission of participating in nation building and being the loyal companion of Malaysians going forward. my



Pos Malaysia's launch of Address for All (AFA) project at Kampung Pirasan, Kota Belud, Sabah. Launch ceremony was graced by YB Datuk Seri Dr. Mohd Salleh Tun Said Keruak, Minister of Communications and Multimedia.

Address For All: Enabling ecommerce fulfilment to everyone

The newly-assigned national addresses initiative will solve the issue of premises with incomplete addresses.

Mohd Iskandar King
iskandar.king@cmc.gov.my

The National Address For All (AFA) initiative provides both social and commercial benefits with accurate logistical infrastructure, such as accurate addresses at its core. Geocoded addresses, along with Global Positioning System and navigation technologies, can provide online commercial activities, such as ecommerce, with appropriate tools to enhance their service quality and efficiency.

From the ecommerce industry's perspective, the AFA initiative will be able to provide primary data for the various organisations that deliver items to a dispersed consumer base. In other words, ecommerce merchants will be able to utilise the newly-assigned national addresses provided by the AFA implementation. The AFA would be contributing significantly in economic development across the nation to communities in both urban and rural areas in developing their businesses.

The initiative aims to identify incomplete addresses and assign them with a proper house number and premise addresses. From surveys, it is revealed that there are still many areas with incomplete addresses. These incomplete or incorrect premise addresses pose difficulties to various parties - for example during emergency situations, where the time taken to look for an address can be the difference between life and death for the residents in the affected premises.

ECOMMERCE

Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply management, internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems.

Delivery-related problems are responsible for 68% of the situations where e-shoppers abandon their ecommerce purchases before finalising the order. These delivery related problems include, amongst others, e-shoppers discovering that they have to pay unexpectedly high delivery costs after adding their items into the shopping cart; items that cannot be delivered because of an incomplete address, especially in rural areas or realising that the expected delivery times are too long.

The delivery of products bought online is a rather complex business arrangement with multiple layers of contracts. The delivery value chain involves four main stakeholder groups, with a variety of different combinations and business models as follows:

- a. **E-shoppers:** Buy products and delivery services from e-retailers;
- b. **E-retailers:** Buy delivery services from delivery operators and logistics intermediaries;
- c. **Delivery operators:** Deliver the products on behalf of the e-retailers. Delivery operators may use other delivery operators as subcontractors; and
- d. **Logistics intermediaries:** Operate in the intersections that exist between e-shoppers, e-retailers and delivery operators.

Studies have found that most e-shoppers and e-retailers are least satisfied with the following aspects of the delivery of products as follows:

- i. Low delivery prices;
- ii. Delivery to the home address;
- iii. Access to electronic delivery notifications and track and trace; and
- iv. Convenient return options.

While features, such as next-day delivery, Saturday or evening delivery, and delivery to a post office or collection point are considered less important. As noted above, the home address is still the preferred delivery point and a complete home address is an important factor that needs to be fulfilled.

ADDRESS FOR ALL PROJECTS

MCMC and Pos Malaysia Berhad (PMB) are committed to providing a world-class mail delivery service. However, in order to provide those services PMB encounter several key problems, especially in rural areas due to incomplete addresses, unnumbered premises or disorganised and inadequate mail delivery infrastructure. Various measures have been taken and will be implemented to ensure that all mail delivery problems encountered can be resolved.

There are approximately 12% or 1 million addresses in Malaysia that are incomplete. Even in urban areas, there are some locations that do not have premise numbers. According to the Department of Statistics, the average household size in Malaysia is 4 persons to a household, which means there are 4 million people without complete home addresses.

MCMC and PMB's main intention is to ensure that existing home and premise address system used throughout the country, regardless whether they are located in a city or outside of a city, meets international standards as recognised by the Universal Postal Union (UPU) and abides by the SIRIM Malaysia's Standard S42. PMB has already developed a database of addresses known as 'Address Information System' to ensure consistency of address system at the national and international level.

In the AFA project implementation, PMB will carry out a systematic method of preparation of a full address that will contain the following information:

- i. Number of premise's structure;
- ii. Street name or name of a specific village; and
- iii. Postcode and city.

Incomplete address is defined as an address with missing delivery information such as unavailable or duplicate house numbers, no specific area or location and so on. For example, it will be a challenge to make deliveries to two different persons having the same name and living in the same area if they do not have unique home addresses. Without an address, communications with the outside world will break down.

For effective implementation, AFA has come up with the following 6 steps to improve the current delivery system:

1. **Delivery Postmen provide the necessary information:** Delivery Postmen who are experts in their delivery area will provide information such as location, geographical and other necessary information. It will help to define a more accurate location and information of the house or premise.
2. **AFA Task Force goes down to the ground to collect information using GPS Tool:** The AFA Task Force team will collect information, such as the longitude and latitude information, original house number (if any), type of house and so on.
3. **The information is plotted into a digital map:** The data collected will be compiled and formatted into a virtual image. The primary function of this technology is to produce maps that will give accurate representations of a particular area. Once the data is plotted, the address numbering process will then commence.
4. **The villagers are engaged for the assignment of house numbers:** After the numbering process, the map will be handed over to the villagers for approval.
5. **House number plaque is installed at the premise:** A plaque will be installed at the house or premise only after the approval of the villagers. Each plaque will have a QR Code, which can be quickly read by the postman using a smartphone application. These QR Codes are used to store the household code, the complete address and a PMB address finder webpage link.

6. **The house number is updated into the Digital Map:** Each premise with a complete address will then be registered in PMB's Address Information System database. The coordinates of the premises will be obtained using GPS and mapped into the digital map and updated into PMB's Mail Processing Machines' database.

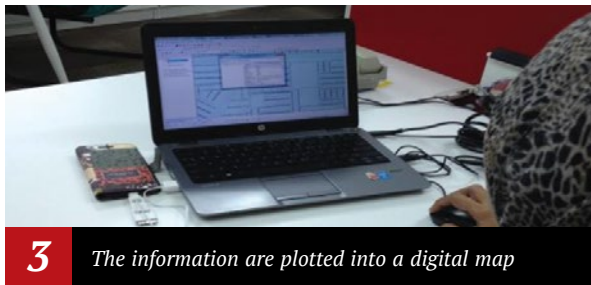
As of today, 60,000 premises have been given these addresses, including premises in Sabah and Sarawak.



1 Delivery Postman provides the necessary information



2 AFA Task Force goes down to the ground to collect information using GPS Tool



3 The information are plotted into a digital map



4 The villagers are engaged for the assignment of house numbers



5 House number plaque is installed at the premise



6 The house number is updated into the Digital Map

AFA implementation procedures

BENEFITS

The project is expected to not only benefit PMB in processing and delivering mails but also other parties that will require the use of accurate addresses. These parties include government agencies such as local authorities, police, fire and ambulance which will be able to arrive at the scene in a timely manner in cases of emergency. The AFA initiative is also in line with the National Postal Strategy (2010-2014) that aims to improve mail delivery service coverage in rural areas.

Among the benefits of the AFA project are as follows:

- Ensure that all premises and houses in Malaysia have full and proper addresses;
- Ensure that all residential addresses of customers are based on a standard address structure that is

recognised by SIRIM, for the purpose of facilitating the processing and delivery of mail or for use by other organizations such as the Police, Fire and Rescue Dept, and Ambulance services;

- Establish a Standard Operating Procedure (SOP) that can be used in a systematic and sustained manner, not only by PMB but also by the local authorities (PBTs) in implementing the numbering system and naming of streets and sub-locations in Malaysia;

- Reduce returned mail (retour) or letters that cannot be delivered because of problem addresses; and
- Achieve MCMC's standard in terms of mail delivery service.

CONCLUSION

Home and Premise Address is a key infrastructure for Malaysia to elevate its status from a developing country to a developed country. By Year 2020, all premises in Malaysia will have complete addresses through the AFA initiative. Alternate delivery methods such as Community Delivery Box can also be proposed for the purpose of reducing delivery costs. Indirectly and this initiative will assist in the provision of effective door to door mail delivery services in rural areas. [my](#)



Communications Device Certification

Certification of communications devices plays a role in ensuring the Malaysian market carries a wide range of safe and interoperable devices.

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Product certification is the process of certifying that a certain product has passed safety, performance and quality assurance tests, and meets qualification and interoperable criteria stipulated in regulations or mandatory specifications. As more and more people use communications devices and for longer and longer periods of time, safety and interoperability of the devices they use become extremely important. Device certification is the process which the government ensures this.

In the communications industry, Malaysian Communications and Multimedia Commission (MCMC) has the responsibility to promote the development of standards which is crucial in ensuring network interoperability and safety of consumers. In line with this objective, communications equipment shall be certified according to the relevant standards before they can be used, offered for sale or sold in the country.

Only communications equipment which are certified as compliant with the standards can be imported into the country. This requirement is enforced through the Customs (Prohibition of Imports)(Amendment)(No 4) Order 2015.

CERTIFICATION

Product certification is often required in safety, health and reliability sensitive industries and marketplace areas where a failure could have serious consequences, such as negatively affecting the health and welfare of the people or person using that product. For example, certification is stringent in aerospace applications, since the demand for low weight tend to lead to high stress on components, requiring appropriate metallurgy and accuracy in manufacturing. Other examples of sensitive products include food, pharmaceutical, healthcare, dangerous goods, and products that have RF emissions such as computers and cellular telephones.

Some of the risks which can be incurred when using non-certified communications devices include electric shock or fire which can be lethal, Electromagnetic Field (EMF) emissions above safe levels and interference or compatibility. The product may also be a fake product and affect customer satisfaction. Finally, the product is likely to be illegal, placing the purchaser in probable breach of the law.

Communication Devices



Communication devices

LEGISLATIVE PROVISIONS

MCMC has the mandate to ensure network interoperability and the safety of consumers. The Communications and Multimedia Act 1998 (CMA 98) provides the legal framework for these responsibilities.

Under section 182 of CMA 98, the use of any technical equipment or systems which hinder network interoperability is an offence. Additionally, under section 183 of CMA 98, the use of any technical equipment or systems which compromise public safety is also an offence.

To achieve these objectives MCMC may designate an industry body to be a forum for technical standards (section 184 of CMA 98). The technical codes prepared by MCMC or the technical standards forum shall include the requirements for network interoperability and safety (section 185 of CMA 98) and MCMC may register certifying agencies for the purpose of certifying compliance with codes or standards (section 186 of CMA 98).

The Communications and Multimedia (Technical Standards) Regulations 2000 (Technical Standards Regulations) further define the legislative rules that regulate the communications devices certification programme. Under regulation 14 of Technical Standards Regulations, all communications equipment are required to be certified.

Regulation 22 (a) stipulates that a supplier of communications equipment shall ensure that all certified communications equipment bears a certification mark or label approved by MCMC or a registered certifying agency, to indicate that it complies with the standards.

Regulation 15 covers the design, installation, operation, maintenance or modification of communications equipment that are contrary to standards or likely to cause interoperability, interference or affect safety. Regulation 16 prevents the use, offer for sale or sale of communications equipment that are contrary to standards, not certified or no longer complies with standards. Regulation 17 stipulates that the affixing of certification marks or labels to non-certified communications equipment or any misleading act is illegal.

There are penalties for non-compliance with the Technical Standards Regulations. Offenders can be fined RM100,000 and/or receive jail sentences of up to 6 months for breaches of regulations 16 and 17. A breach of regulation 15 may result in a fine of RM300,000 and/or a jail term of 3 years.

It is the responsibility of the manufacturer or importer of the communications equipment or an authorised agent of the manufacturer or importer to ensure that their communications product is certified and carries the MCMC certification label.

STANDARDS

Device certification starts with the standardisation process. A certified device is usually verified to comply with a standard or specification. Standards are the applicable technical standards including processes and procedures established for the purpose of ensuring the safety, non-interference, performance and interoperability of any communications equipment and network facilities.

The body responsible for the certification scheme (in this case, MCMC) has the responsibility to consider the choice of available specifications and to select and adopt the applicable ones, set qualification limits, and enforce compliance to those limits.

Standards are usually set or adopted by industry bodies through a process of discussion, investigation and consultation. Once a standard has been agreed upon, the industry concerned will then develop products and services according to the specifications that have been decided.

COMMUNICATIONS STANDARDS

MCMC together with the Malaysian Technical Standards Forum Berhad (MTSFB) develop standards for the Malaysian communications industry. MTSFB is an industry forum that was designated as a technical standards forum under the mandate given to MCMC in the CMA 98. It develops and recommends codes or standards for registration under the CMA 98. Membership is open to operators, manufacturers, vendors, universities, R&D organisations, government agencies or non-government agencies and other interested parties.

The process of standardisation is carried out by established Working Groups. Areas covered by the MTSFB are fixed and wireless terminals, network infrastructure, terrestrial and satellite broadcasting, IPv6, Internet of Things etc. Once these standards have been registered under the CMA 98, all devices meant for the Malaysian market have to be certified for compliance with these standards.

The finalisation of a standard goes through a process of study, drafting, consulting and approval. First there is the formation of a Working Group (WG). The WG then drafts the Standard. The draft Standard is then put up for public comments or consultation. After comments are received, the WG will review the comments. A final draft is then readied and approved by the Reference Panel and MTSFB Board. It is then submitted as a recommendation to MCMC. After approval by MCMC, the Standard will be registered and published. Details of all standards and codes approved by MCMC can be found at <http://www.skmm.gov.my/>.

DEVICE CERTIFICATION

Product certification bodies usually are Accreditation Bodies that adhere to ISO/IEC Guide 65:199, an international standard for ensuring competence in those organisations performing product certifications.

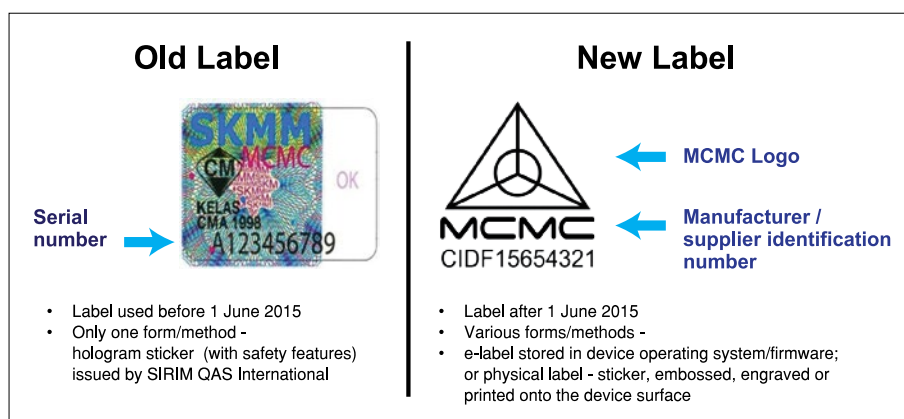
SIRIM QAS International is the Certifying Agency (CA) appointed by MCMC for the purpose of certifying compliance with codes and standards issued by MCMC for all communications equipment. SIRIM QAS International is also the Cross Border Regulatory Agency (CBRA) appointed by the Royal Malaysian Customs for the purpose of issuing import permit for all communications equipment imported into the country.

The process for certification of a device is generally summed up in four steps:

- Application which includes submission of the product test reports, issued by an accredited lab;
- Evaluation to determine if the test reports indicate that the product meets the qualification criteria;
- Decision, where the certification body certifies that the product meets the standards and certification criteria; and
- Surveillance, by which the regulators monitor the market to ensure that products in the marketplace continue to meet the standards and certifications criteria.

The certification requirements for communications devices cover the following areas:

- Safety (Electrical and Radio Frequency Specific Absorption Rate);
- Interoperability (Performance Characteristics); and
- Radio Frequency (Frequency, Power Limit and Electromagnetic Compatibility).



Old and new MCMC certification labels

MCMC CERTIFICATION LABEL

All certified communication devices sold in Malaysia shall have an MCMC certification label on them. Some of the communication devices which must carry such labels include mobile telephones, WiFi devices, walkie-talkie, digital or satellite TV devices, computers, laptops, tablets, fixed phones and fax machines, just to name a few. In June 2015, MCMC introduced a new labelling program which allows certificate holders to prepare MCMC labels on their own through Self-Labeling Program (SLP) administered by SIRIM QAS International. This programme aims to facilitate the ease of certified products being labelled by the certificate holders and improve the business process.

Prior to that, MCMC label was in the form of hologram stickers which were issued to certificate holders by SIRIM QAS International.

The new MCMC certification label can be physical or in the form of an e-label. The physical label is normally affixed onto the device casing. It may be printed on warranty cards or device manuals in the case of tiny devices. In the case of e-labels, they are usually found in the mobile phone firmware (Settings >> General >> About device >> Legal information >> Regulatory). The authenticity of an MCMC certification label can be checked at <https://ecomm.sirim.my> or by downloading the Check Your Label mobile smartphone app.

The first thing to do when verifying a communications device is to look for the MCMC certification label (e-label or physical label) before buying a communication device. The user can then retrieve the IMEI number of that device by typing *#06# or by locating the serial number of that device. Next would be to ensure that the device's approval information displayed (model number, brand, supplier, etc.) are accurate and belong to the device. This can be done by entering the device details at the www.ecomm.sirim.my site or the Check Your Label mobile smartphone app.



Spreading the message through road shows and exhibitions

SURVEILLANCE PROGRAMME

MCMC has embarked on a periodical market surveillance programme in collaboration with SIRIM QAS International. Market surveillance is an essential mechanism to promote continued compliance of regulated equipment.

Market surveillance is effective because it closes the loop between the product sample(s) submitted for compliance certification and those sold in the market. It involves purchases of samples from the market according to a sampling plan. These samples will then be evaluated to ensure they meet all the requirements. The process includes stringent testing and verification of certification records as well as authenticity of the certification labels. If non-certified or non-compliance devices are found, the parties concerned will be notified to explain why action cannot be taken against them. Where necessary, sanctions (administrative or legal) are undertaken against the errant parties.

CHECK YOUR LABEL CAMPAIGN

Check Your Label (CYL) is a campaign to create awareness among consumers on the importance of buying communication devices with a valid MCMC certification label. Communication devices without the label may be counterfeit/clone or illegal (e.g. WiFi cracker, frequency jammer). The campaign guides consumers on how they can verify the validity of the label on the communication devices.

The campaign uses various channels to educate consumers. Campaign channels include roadshows and exhibitions at popular gadget malls, newspaper advertisements as well as large billboards along major highways. The campaign aims to educate consumers that by deciding to choose certified products, they have made the right decision for their safety. my



One of the advertisements used in the campaign



Fixing the E-waste Problem

Proper e-waste management is crucial if we are to ensure a sustainable future and not end up with mountains of discarded electronic items.

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Rose Kuan Yoke Lean
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Shan Poornam Metals Sdn. Bhd.

E-waste, is basically waste electrical and electronic equipment and is one of the fastest growing streams of waste in developed as well as in developing countries. Rapid technology innovation and ever-shortening product lifespans, especially for information and communication technology (ICT) products such as computers and mobile phones are among the factors contributing to the growing size of e-waste. It is estimated globally that the total amount e-waste generated in 2014 was 41.8 million metric tonnes leading not only to a significant adverse environmental impact, but also to the systematic depletion of precious materials resources. There are valuable materials in e-waste that can be recovered through urban mining, a process of reclaiming compounds and elements from e-waste.

According to United Nations University (UNU) - The Global E-Waste Monitor 2014 report, only about 15% of the e-waste produced worldwide is recycled formally. Exposure of vulnerable populations such as women and children around dump sites has impact across generations.

E-WASTE DEFINED

The term e-waste basically covers all electrical and electronic equipment (EEE) items and its parts that have been discarded by its owner as waste without the intent of reuse. Depending on different regions of the world, it may also be referred to as Waste Electrical and Electronic Equipment (WEEE), electronic waste or e-scrap. It embraces a broad range of products and cover almost any household or business item with circuitry or electrical components with power or battery supply.

There are six categories of e-waste:

- Temperature exchange equipment. These are more commonly referred to as cooling and freezing equipment such as refrigerators, freezers, air conditioners and heat pumps.
- Screens, monitors. Typical equipment comprises televisions, monitors, laptops, notebooks, and tablets.
- Lamps. These include straight fluorescent lamps, compact fluorescent lamps, high-intensity discharge lamps and LED lamps.

- Large equipment. These are large home and office equipment such as washing machines, electric stoves, large printing machines, copying equipment and photovoltaic panels.
- Small equipment. Typical equipment comprises vacuum cleaners, microwaves, ventilation equipment, toasters, electric kettles, electric shavers, scales, calculators, radio sets, video cameras, electrical and electronic toys, small electrical and electronic tools, small medical devices, small monitoring and control instruments.
- Small IT and telecommunication equipment. This category includes mobile phones, GPS, pocket calculators, routers, personal computers, printers, telephones.

(Source: *The Global E-Waste Monitor 2014*, United Nations University, IAS – SCYCLE, Bonn, Germany)

THREATS FROM E-WASTE

In recent times, policymakers, producers and recyclers in various countries have created specialised ‘take-back and treatment’ systems to collect e-waste from owners and process it in proper treatment facilities. However, these

efforts in the collection and state-of-the-art treatment of e-waste is limited, and most nations are still without such e-waste management systems. There remains a significant portion of e-waste that is not being collected and treated in an environmentally-sound manner.

E-waste contains valuable materials, and this draws individuals or groups of collectors to collect e-waste and extract valuable substances, components or parts and sell them to the recycling industry. What is of concern is that the treatment process of e-waste is hazardous to human health and the environment. Moreover, those who handle e-waste informally are usually neither well aware of nor trained in environmentally sound management of e-waste, occupational safety and health (OSH), and other decent work standards applicable to this field.

Further, some of the world’s e-waste is shipped over great distances to developing countries where rudimentary and inefficient techniques are often used to extract materials and components or parts. These ‘backyard’ techniques pose dangers to ill protected workers and the local natural environment. World-wide trading of electronics and substandard recycling in developing countries has led to environmental disasters in places like Guiyu, China and Agbogbloshie, and Ghana.

Table 1: Chemicals of primary concern in e-waste

Elements	Component Of Electrical And Electronic Equipment	Ecological Source Of Exposure	Health Concerns
Cadmium	Switches, springs, connectors, printed circuit boards, batteries, infrared detectors, semi-conductor chips, ink or toner photocopying machines, cathode ray tubes, and mobile phones	Air, dust, soil, water, and food. (especially rice and vegetables)	Has toxic, irreversible effects on human health and accumulates in kidney and liver (op. cit.). Has toxic effects on the kidney, the skeletal system and the respiratory system, and is classified as a human carcinogen (WHO, 2010c).
Chromium or hexavalent chromium	Anticorrosion coatings, data tapes, and floppy disks	Air, dust, water, and soil.	Damages kidneys, the liver and DNA. Asthmatic bronchitis has been linked to this substance (Osuagwu & Ikerionwu, 2010). Causes irritation of the respiratory system (asthma) and skin, liver and kidney damage, increased or reduced blood leukocytes, eosinophilia, eye injury, and is a known carcinogen (lung cancer).
Lead	Printed circuit boards, cathode ray tubes, light bulbs, televisions (1.5–2.0 kg per monitor), and batteries.	Air, dust, water, and soil.	Causes damage to central and peripheral nervous systems, blood systems and kidneys, and affects the brain development of children (Osuagwu & Ikerionwu, 2010). A cumulative toxicant that affects multiple body systems, including the neurological, haematological, gastrointestinal, cardiovascular and renal systems (WHO, 2010e).
Lithium	Batteries	Air, soil, water, and food (plants)	Extremely hazardous in case of ingestion as it passes through the placenta. It is hazardous and an irritant of the skin and eye, and when inhaled. Lithium can be excreted in maternal milk (Material Safety Data Sheet, 2005)
Mercury	Thermostats, sensors, monitors, cells, printed circuit boards, and cold cathode fluorescent lamps (1–2 g per device)	Air, vapour, water, soil, and food (bio accumulative in fish)	Elemental and methyl-mercury are toxic to the central and peripheral nervous system. Inhalation of mercury vapour can produce harmful effects on the nervous, digestive and immune systems, lungs and kidneys, and may be fatal. The inorganic salts of mercury are corrosive to the skin, eyes and gastrointestinal tract, and may induce kidney toxicity if ingested (WHO, 2007)
Nickel	Batteries	Air, soil, water, and food (plants)	Slightly hazardous in case of skin contact, ingestion and inhalation. May be toxic to kidneys, lungs, liver and upper respiratory tract. Also have carcinogenic effects. (Material Safety Data Sheet, 2005)
Zinc	Cathode ray tubes, and metal coatings.	Air, water, and soil	Contact with eyes can cause irritation; powdered zinc is highly flammable (University of Oxford, 2005); if inhaled, causes a cough, and if ingested, abdominal pain, diarrhoea and vomiting is common (ICSC database, nd.)

Source: 1. *The global impact of e-waste: addressing the challenge* / Karin Lundgren; International Labour Office, Programme on Safety and Health at Work and the Environment (SafeWork), Sectoral Activities Department (SECTOR). – Geneva: ILO, 2012
 2. Grant K et al. *Health consequences of exposure to e-waste: a systematic review on health effects of e.waste. The Lancet.*

Generally, exposure to the hazardous components of e-waste is most likely to arise through inhalation, ingestion, and skin contact. In addition to direct occupational (formal or informal) exposure, people can come into contact with e-waste materials, and associated pollutants, through contact with contaminated soil, dust, air, water, and through food sources, including meat. Children, fetuses, pregnant women, elderly people, people with disabilities, workers in the informal e-waste recycling sector, and other vulnerable populations face additional exposure risks.

Children are a particularly sensitive group because of additional routes of exposure (e.g. breastfeeding and placental exposures), high-risk behaviours (e.g. hand-to-mouth activities in early years and high risk-taking behaviours in adolescence), and their changing physiology (e.g. high intakes of air, water, and food, and low rates of toxin elimination). The children of e-waste recycling workers also face take-home contamination from their parents' clothes and skin and direct high-level exposure if recycling is taking place in their homes. Specific chemical elements and compounds are associated with e-waste, either as components of the equipment or released during the recycling process.

The most common potentially hazardous chemical elements that are also components of electrical and electronic equipment are lead, cadmium, chromium, mercury, copper, manganese, nickel, arsenic, zinc, iron, and aluminium.

(Source: Grant K et al. Health consequences of exposure to e-waste: a systematic review on health effects of e.waste. The Lancet.)

BENEFITS FROM PROPER E-WASTE MANAGEMENT

According to the Department of Environment (DoE) Malaysia, we are not isolated from this problem. E-waste generation has been increasing and is estimated to increase even more in the future. E-waste generated from industrial sources such as some semi-finished products, end material or punching scrap are already regulated by Environmental Quality Regulations 2005. On the other hand, e-waste generated from non-industrial sectors (especially household) such as TVs, air conditioners, washing machines, refrigerators and among others are not yet regulated properly under the current regulations. As a consequence, most of the e-waste end up being improperly recycled and disposed through informal channels.

If there are no concerns with intellectual property rights, e-waste management can be carried out with the following options in mind:

- (a) Reuse. Donate it away should it still be functioning.
- (b) Repair or refurbished so that it can still function.
- (c) Recover and Reuse of functional components.
- (d) Recovery of constituent elements when the components cannot be reused.

- (e) Final disposal of hazardous and non-hazardous waste at permitted sites approved by Government.

By implementing the above, natural resources are conserved and the life of e-waste can be extended. For equipment that are reaching end of life, recycling recovers valuable materials which can be used in the raw materials supply chain. These materials can be used back to manufacture the same product thus promoting an eco green product or other new products. Thus, energy consumption, pollution, greenhouse gas emissions are reduced; global warming is minimised and resources are saved because fewer materials are mined.

Recycling in an environmentally sound management facility protects the environment and minimises land filling. Managing an environmentally sound management facility requires professional recyclers who use green technology to produce green product. Also, recycling creates more job opportunities.

MCMC & INDUSTRY INITIATIVES

MCMC is concerned about the growing number of unused mobile phones due to rapid technology advances in the communication and multimedia industry since mobile broadband was introduced in 2009. MCMC is aware that these devices contain materials that can be harmful to the environment and human health if not disposed off properly. Research by the US Environmental Protection Agency shows that the average life span of a mobile phone is around 18-24 months. Furthermore, based on statistics from SIRIM QAS, there are 65.7 million units of mobile phones registered before 2014. Thus, it is estimated that there are more than 65.7 million mobile phones which can be considered as e-waste; either kept at home or ended up in landfills.

Other contributing factors to the low lifespan of mobile phones are planned obsolescence and technology progression. Planned obsolescence takes place when manufacturers have a policy of planning or designing a product with an artificially limited useful life, so it will become obsolete, that is, unfashionable or no longer functional after a certain period of time thus shortening the replacement cycle. Technological progression in the information age has had and will continue to improve life for many years to come. The deployment of Machine to Machine (M2M) and Internet of Things (IoT) are examples of technology progression that will contribute to the continuous e-waste production.

MOBILE E-WASTE: 'OLD PHONE, NEW LIFE' PROGRAMME

The idea to promote environmentally safe disposal of mobile e-waste was first mooted back in 2013 as a response to Resolution 79 adopted at the World Telecommunication Standardisation Assembly in November 2012 (WTSA-12) which invited Member States to take all necessary measures to handle and control

e-waste in order to mitigate the hazards which can arise from used telecommunication/ICT equipment.

Through a series of workshops and discussions, a sustainable model for the Mobile e-Waste Initiative was developed by the MCMC and the telecommunication industry stakeholders under the Green Information and Communication Technology Working Group (GICT WG) as well as the Full Recycling Facility (FRF). The intention is to create a perpetual sustainable business model to ensure the success of the initiative. It took about 18 months to develop a self-sustainable and practical framework of the e-waste programme in a 'win-win' collaboration towards a better tomorrow.

The Mobile e-Waste: 'Old Phone, New Life' initiative was officially launched by the Deputy Minister of Communications and Multimedia on 18 August 2015. The initiative's joint partners; MCMC, Malaysian Technical Standards Forum Bhd (MTSFB), Altel, Celcom, Digi, Maxis, Telekom Malaysia, U Mobile and Shan Poornam Metals Sdn. Bhd. participated in the launching ceremony. To date, there are another two new members: UPM and Lions Club Kota Bharu.

The main objective of the programme was to educate the public about environmentally safe E-waste disposal and recycling of end-of-life (EOL) mobile devices and instil in them a 4 R (reduce, reuse, recycling and recover) culture in Malaysia. The programme advocates awareness on the potentially hazardous effects on health and environment due to improper disposal of mobile devices; and education on the steps that could be taken to recycle and refurbish unused mobile devices.

Mobile e-Waste: 'Old Phone, New Life' programme encourages users to dispose unused mobile devices and all its accessories and peripherals in collection bins that are placed in all participating telecommunication outlets nationwide. The collected mobile e-waste will then undergo recycle and recovery processes at the appointed licensed Full Recovery Facility (FRF).

Members of the public may drop-off or dispose their mobile e-waste into the Mobile e-Waste collection boxes that are located at participating outlets. The recyclers will then collect and transport the mobile e-waste to the Full Recovery Facility (FRF) for proper disposal.

The mobile e-waste recycling process involves safe removal of any data left on phones. However, it would be best if members of the public practised the following steps before throwing their old devices into the collection box:

- i. Terminate the service (if applicable);
- ii. Transfer data from the mobile device memory, external storage card and SIM card to a new device;
- iii. Make sure all remaining data is deleted or carry out a factory hard reset;
- iv. Remove and destroy unused SIM cards and external storage cards from mobile devices; and
- v. Dispose the mobile device, SIM card, external storage card and accessories into the allocated slots of the Mobile e-Waste collection box.

The list of participating outlets can be found at <http://mobileewaste.mcmc.gov.my/en-us/where-do-we-recycle#throw>

Besides the collection boxes placed at participating outlets under the Mobile e-Waste program, the public can also dispose the unused mobile phones at collection points managed under the e-Waste Alam Alliance program. The collection points can be found at <http://www.doe.gov.my/household-ewaste/collection-points/>

FULL RECOVERY FACILITY (SHAN POORNAM METALS SDN. BHD) FULLY RECOVERY FACILITY (WHY CHOOSE SPM)

After thorough auditing, the Malaysian telecommunication industry in collaboration with the MCMC and MTSFB appointed Shan Poornam to be the official recycler of the 'Old Phone New Life' programme.

The Shan Poornam group's transformation journey from a trader to a manufacturer started in 2006 when e-waste was regulated. Today it has grown into a regional group with integrated environmentally sound management facilities to manage up to 5000 MT industrial hazardous and non-hazardous waste per month, namely e-waste, spent acids, alkalines, solvents, sludges, dross and non-ferrous metal scrap.

The group has offices in Sabah and Sarawak and Peninsular Malaysia and currently employs 500 trained and dedicated personnel with comprehensive expertise in this industry. As a leading company in scheduled waste management, driven by the 4R (Reduce, Reuse, Recycle, Recover) green concept, the group is equipped with an innovative R&D team with cutting edge customised technology similar to those found in Europe, the United States and Japan.

Most recyclers in the country are focused on industrial waste. The recycling of the consumer e-waste including ICT and mobile equipment and devices is actually the missing eco-link for a sustainable environment. This group is now embarking into household e-waste recycling and CFC recovery which will be the first in Malaysia and South East Asia. They will further enhance their research and development to meet the challenges of growing waste generated through fast paced introduction of new products.

Their eco-green finished products are mainly secondary aluminium ingots, platinum, gold palladium, silver, ferrous and non-ferrous metals under the eco label of 'ENS –Environment, Nature, Society'. Their secondary aluminium ingots produced are RoHS compliance and comply with the Japanese International standards, British Standards and American Standards.

Shan Poornam is ready to support the Government's vision of Green Procurement policy in line with RMK 11 (11th Malaysia Plan). Its total commitment towards continuous improvement in environmental protection and conservation using green technologies that produce

green products has been recognised locally with the highest Award in the country namely, the Prime Minister Hibiscus Award for both Environmental Performance and Special Project Category as well as Malaysian International Trade and Industry (MITI) Industrial Excellence Award. In the international arena, Shan Poornam has received awards from United Arab Emirates (UAE) and Spain for excellence and leadership in relation to the environment.

Its environmentally friendly manufacturing practice and high standards in quality control have earned the group certifications for ISO 14001, ISO 9001 and OSHAS 18001.

Other notable achievements are:

- a) Speaker and Panelist at United Nations Environment Program (UNEP) and International Environmental Technology Centre (IETC).
- b) Coverage in both local and International publications which includes “SCRAP Magazine” published by Institute of Scrap Recycling Institute (ISRI) in Washington DC.

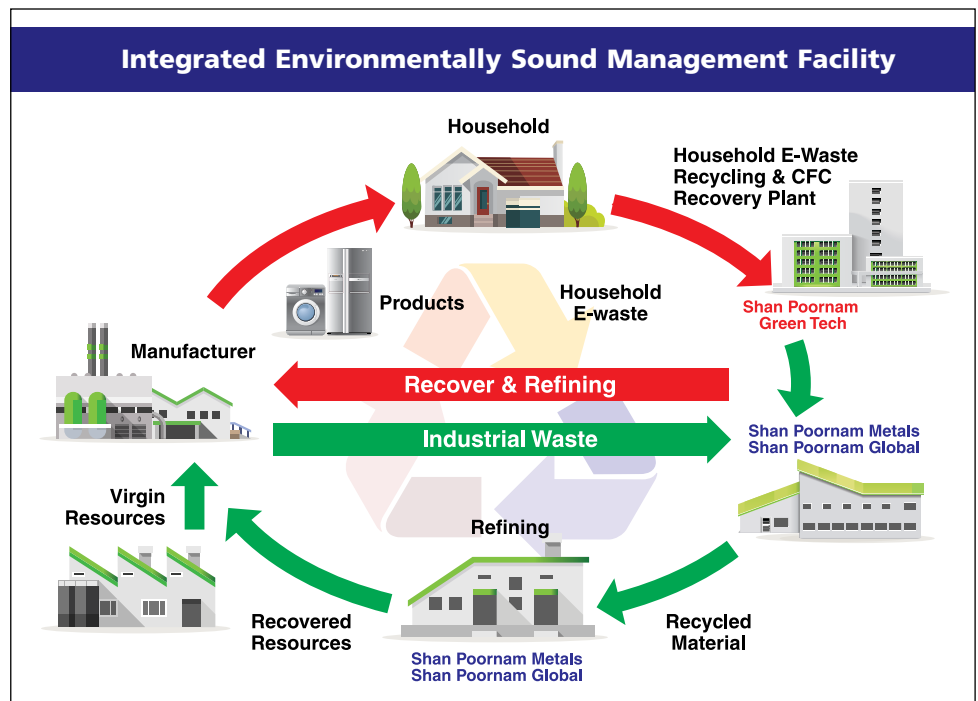
In recognising their capabilities, the Department of Environment Malaysia (DOE) and Japanese International Corporation Agency (JICA) has appointed Shan Poornam to spearhead the recycling and recovery of household e-waste including ICT and chlorofluorocarbon (CFC) recycling at the national level. The Ministry of Economic Trade Industry Japan (METI) also funded technology transfer from Japan to Shan Poornam.

Current technologies employed by the informal sector do not exceed 60% extraction which subsequently leads to these E-Waste either being mismanaged or eventually deposited in landfills. Most importantly there are no other recycling firms that completely capture and recycle CFCs (Chlorofluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs), Hydrofluorocarbons (HFCs) and pentane) gas that is commonly found in household e-waste. CFCs is primary responsible for the depletion of the ozone layer in the stratosphere and global warming. Shan Poornam is investing in cutting edge technologies from Japan and Germany to ensure zero CFCs escapes and enable it to recover household e-waste up to 98%.

The benefit to the nation will be tremendous. Shan Poornam will create a much cleaner environment by recycling e-waste just as well as any developed nation.

These activities are of national importance as:

- a) Reducing emission of greenhouse gas which includes CFC is one of the National Mitigations Actions pledged by Malaysia towards the world effort in Climate Change as per Copenhagen Accord 2009. Shan Poornam will be able to contribute towards Malaysia’s pledge in 2009 to ‘reduce its carbon dioxide emissions (levels) to 40 per cent by the year 2020 compared to the 2005 levels’;
- b) Shan Poornam is providing infrastructure needed by both local and overseas manufacturers to fulfil their commitment to Extended Producer Responsibility (EPR) for Household E-Waste and CFC Recycling which will in turn help the country to comply with the Basel Convention;
- c) There will be high impact on the economy as the nation will be able to conserve natural resources;
- d) Malaysia would be a good role model for household E-Waste ‘White Goods’ management system in South East Asia. It will spur the growth of a whole new economy;
- e) It is a one of a kind project undertaken by a developing nation and definitely at standards comparable to that of developed nations in line with Vision 2020; and
- f) Most importantly it will reduce our landfill problems and improve the socio-economic status of Malaysians.



Closed Loop Link - Ecosystem Sustainability

With its existing facilities and new facilities that will be established to manage the recovery and recycling of the Household e-waste and CFC recycling, Shan Poornam will put Malaysia on the global map as a pioneering developing nation in e-waste management.





Income Tax E-Filing, a Digital Services Case Study

Ten years ago, the Inland Revenue Board introduced e-filing, making it one of the earliest e-government services in this country.

Nazril bin Mohd Ghani
Pos Digerit Sdn. Bhd.

The implementation of e-Filing in Malaysia by the Inland Revenue Board, more commonly known as Lembaga Hasil Dalam Negeri Malaysia (LHDNM), began in 2006. This e-government service enabled individual taxpayers to submit tax payments electronically. It was launched as part of the e-Government initiative that aimed to enhance the delivery of government services to internal and external stakeholders through the use of information technology. This was in line with the aspiration of Malaysia achieving the objectives of Vision 2020.

The e-Filing system is essentially an easier method for taxpayers to submit their tax filings, compared to the traditional system where one has to deliver their physical tax forms directly to the state tax office. With

the implementation of the e-Filing system, qualified individual taxpayers could choose between sending their tax returns electronically or manually.



e-Filing being promoted

WHY E-FILING

Among the main objectives of the implementation of the e-Filing system are to increase the speed and effectiveness of the processing of tax returns submitted by taxpayers to the tax agency. This is important because every year the number of eligible individual taxpayers increases progressively, directly affecting the work load and time required by the tax agency to process tax forms received.

The e-Filing system is open around the clock while, in comparison, manual filing is limited by the operation hours of the state tax offices. Furthermore, the main bulk of the tedious and lengthy process before the advent of e-Filing was the heaps of data entry work required. Manual filing increases operating costs and data entry errors. The processing time and potential errors are greatly reduced in e-Filing because the inherent characteristics of an e-Filing system help taxpayers fill out their tax forms more efficiently. Tax refunds to tax payers can similarly be processed faster and more efficiently due to the computerised system.

THE EVOLUTION OF E-FILING

Back in 2004 and 2005, when the first step towards computerisation of the Tax Filing processes began, the system was rather rudimentary in nature. Taxpayers could only download the tax filing forms in Microsoft Excel and Adobe PDF formats. After filling in and printing the forms, taxpayers still had to go over to their respective state tax offices and manually deliver the forms. While this system was a step forward, it was still troublesome.



Diskettes were originally used to store tax payers' digital certificates

The next logical step for LHDNM then was to work on a system that would enable tax submissions to be completed over the web effortlessly. This e-Filing system would eliminate most of the hassles and difficulties associated with the annual submission of tax returns.

MAINTAINING THE INTEGRITY OF THE SYSTEM

While the concept of e-Filing is simple and very attractive, building a system that is robust and safe was not an easy task given that e-Filing is essentially an online web service. LHDNM was concerned about the increasing threats of malicious cyber-attacks on business

applications and networks that rely on the use of digital credentials to control how users and entities access sensitive data and critical system resources.

To cultivate taxpayers' trust, the e-Filing system is protected by Public Key Infrastructure (PKI) based security with digital signatures on top of common security features such as firewall, intrusion prevention system (IPS) and anti-virus. PKI technology which strengthens online transaction security, and at the same time protects users' sensitive information is the main strategy deployed to tackle online security issues. This directly addresses processes that require proof of the identity of participants in a transaction; proof that the contents of communications have not been tampered with; and protection of sensitive or restricted data. In other words, it addresses three critical elements in internet security which are authentication; integrity and confidentiality. Another element addressed is the principle of non-repudiation which means that it will not be possible to successfully challenge the validity of any transaction.



Digital certificate registration pre-printed slip



A print of a Digital Certificate Pin Number

PKI are necessary to help ascertain the identity of different people, devices, and services. In a nutshell, PKI goes way beyond the use of user IDs and passwords, employing cryptographic technologies such as digital signatures and digital certificates to create unique credentials that can be validated beyond reasonable doubt and on a mass scale. PKI technology is already used more widely than one might think. It is a cornerstone of how data is encrypted as it is passed over the internet using Secure Sockets Layer (SSL) and Transport Layer Security (TLS). Basically without PKI any sensitive online or ecommerce transaction would not be practical.

To drill down into how PKI actually functions, cryptography is deployed to provide all users in a particular group with a set of cryptographic 'keys'. A public key available to anyone in the group and there is a private key which must be kept secret and only used by the entity to which it belongs. The keys are typically used for tasks such as decryption or for the creation of digital signatures.

POS Digicert

A digital certificate is an electronic "passport" that allows a person, computer or organization to exchange information securely over the Internet using the public key infrastructure (PKI).

WHAT IS A DIGITAL CERTIFICATE?

Just like a passport, a digital certificate provides identifying information which is forged resistant and can be verified because it was issued by an official, trusted agency.

The certificate contains the name of the certificate holder, a serial number, expiration dates, a copy of the certificate holder's public key (used for encrypting messages and digital signatures) and the digital signature of the certificate-issuing authority (CA) so that a recipient can verify that the certificate is real.

To provide evidence that a certificate is genuine and valid, it is digitally signed by a root certificate belonging to a trusted certificate authority. Many digital certificates conform to the X.509 standard.

Digital Certificate infographic

Digital certificates are critical to the proper functioning of a PKI. Much like how a passport certifies one's identity as a citizen of a country; the digital certificate gives the keys pair a meaning and establishes the identity of users within a group. As a consequence it is vital to protect the authenticity and integrity of the digital certificates and the process by which they are created and issued - otherwise, the credentials cannot be trusted and are worthless.

DIGITAL CERTIFICATES

The e-Filing journey was not all plain sailing; it had its share of challenges. In the early stages of the e-Filing implementation, taxpayers were required to buy digital certificates embedded in smartcards along with smart card readers costing between RM70 to RM100.

Certificate Information

This certificate is intended for the following purpose(s):

- All application policies

* Refer to the certification authority's statement for details.

Issued to: MUHAMMAD BIN JAMALUDDIN
Issued by: Digicert Sdn. Bhd.
Valid from: 04/10 06:26 PM
 to
 04/13 06:26 PM

You have a private key that corresponds to this certificate.

Issuer Statement

Digital Certificate

This approach was unpopular with the taxpayers due to the high cost needed to be incurred by them. Pursuant to this, the management of LHDNM suggested to the Government of Malaysia to absorb the cost of the PKI. Starting 2006, to encourage the use of the e-Filing system and realise the national electronic government concept, digital certificates for the e-Filing system were provided for free via the implementation of Roaming PKI.

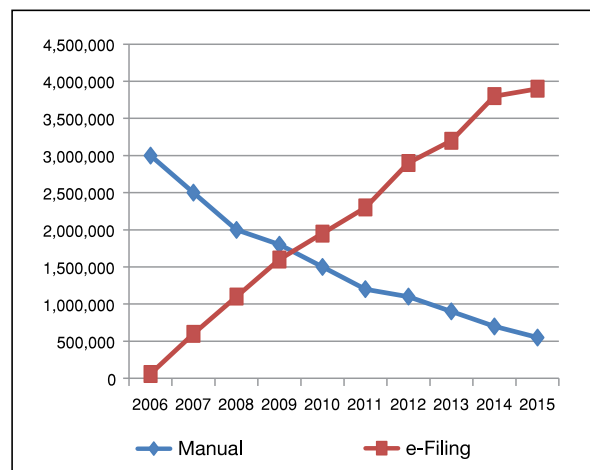
The changes brought dramatic results. In 2005, during the initial development years of e-Filing, there were only 28 users of the e-Filing system and they were mostly LHDNM officers themselves. Upon the implementation of the Roaming PKI and the issuance of free digital certificates, the acceptance level grew almost instantaneously. By the year 2008 official e-Filing submissions reached one million submissions. This achievement clearly indicated that the steps taken to ease the e-Filing process were to the taxpayers' satisfaction.



LHDNM's landmark moment: 1 million e-Filing submissions achieved

E-FILING TODAY

Since then, the e-Filing system has greatly impacted both the tax payers and the tax agency. LHDNM forecasted that qualified individuals who will be using the e-Filing system shall reach a minimum of 98% percent by the year 2020. This is supported by the statistics for e-Filing submissions illustrated below:



Manual filing vs e-Filing over the years

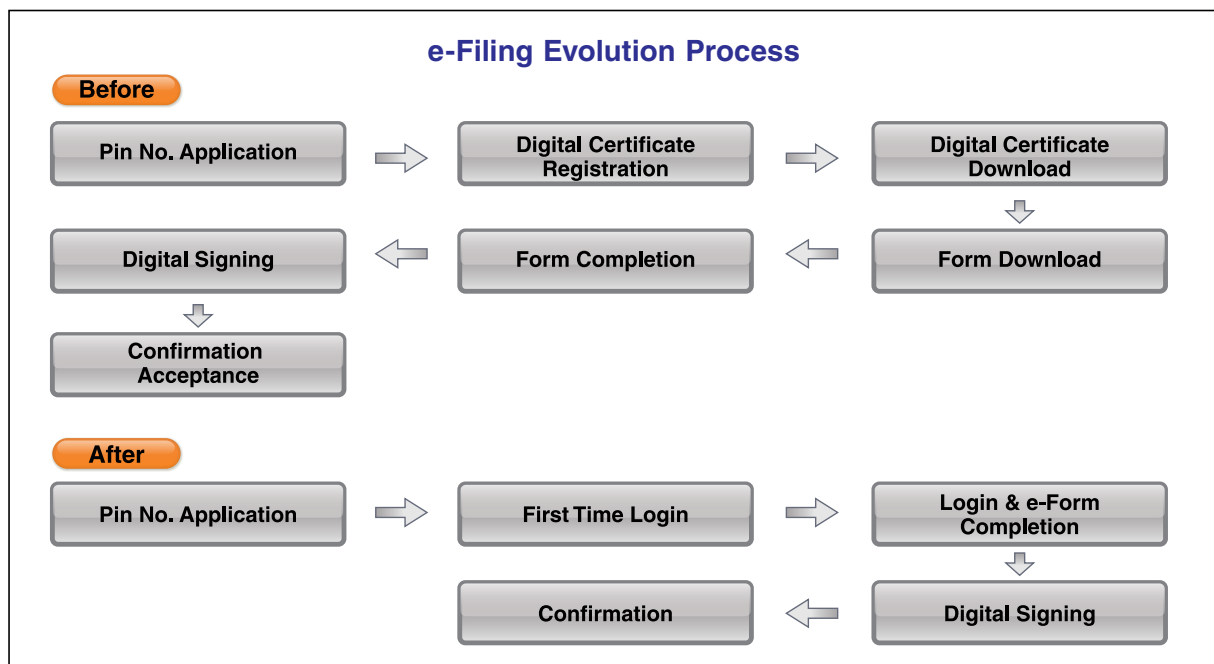
E-FILING AND MANUAL FILING NUMBERS OVER THE YEARS

Submission by taxpayers using the e-Filing system continued to increase sharply every year from 2006 to 2015, while manual tax submissions numbers dropped drastically. The numbers achieved are in line with the 4 million e-Filing users 2016 target set by LHDNM's management.

work processes in relation to the e-Filing system are easy to use, efficient and in line with the development of the latest technologies. The infographic below details the evolution process of the e-Filing system:

RECOGNITIONS

The Information & Communication Technology (ICT) Security Management for e-Filing system was awarded



Simplification of e-Filing processes

Among the primary objectives of e-Filing is to ensure that the system is user-friendly and easy to be used by the taxpayers. From the early inception days of the e-Filing system, it has undergone a couple of transformation processes over time. This was done to ensure that the

the ISMS certification MS ISO / IEC 27001: 2007 in January 2014 for operating the e-Filing Data Centre. The certification proves LHDNM has successfully met the requirements of information security standards through the audit conducted by an independent and accredited certification authority.



LHDNM was awarded the latest ISMS Certification ISO / IEC 27001:2013 in March 2015

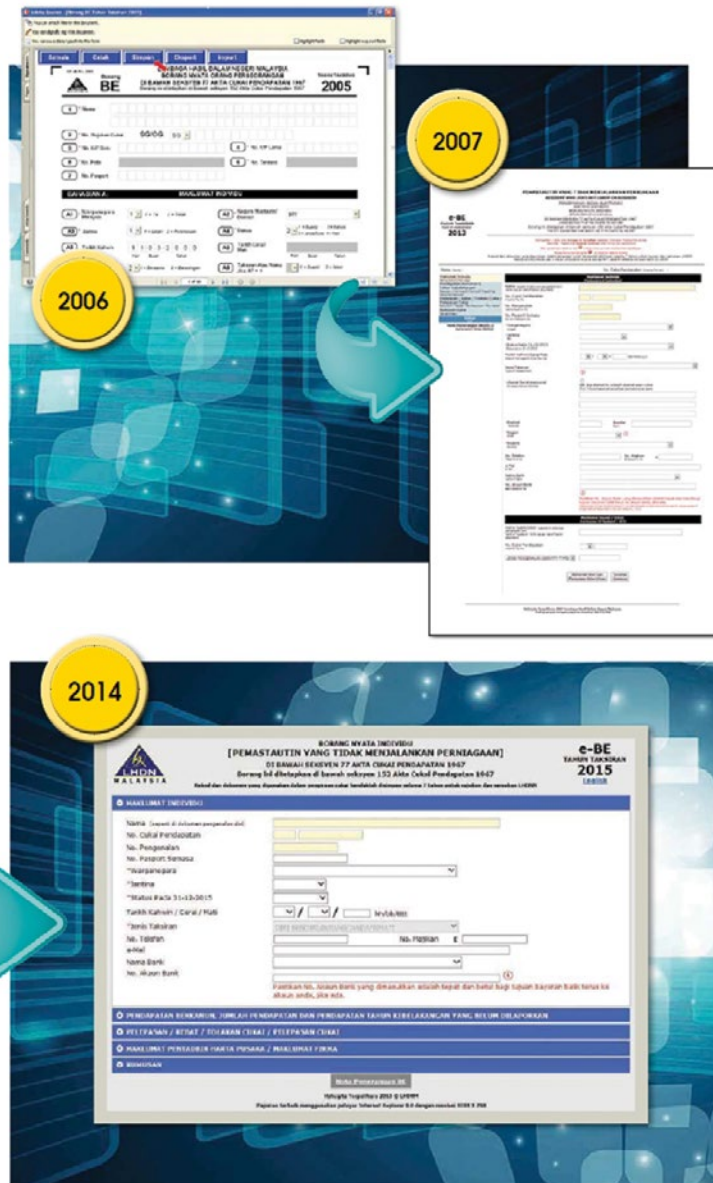
In mid-2014, the enforcement of certification transition of ISMS ISO / IEC 27001:2007 to ISMS ISO / IEC 27001:2013 further impacted the certification received by LHDNM previously. LHDNM was required to make changes to documents and related work processes to keep pace with the latest certification requirements and remain consistent with the standards of maintaining the security of information.

After implementing the required changes, LHDNM was awarded ISMS certification ISO / IEC 27001:2013 in March 2015.

It benchmarks LHDNM's ability to handle information confidentiality, integrity and the continuous availability of e-Filing operations. It also proves that the LHDNM uses a systematic approach to identifying, evaluating and managing information security risks. The ISMS certification also demonstrates the strong support and commitment from the top management of LHDNM in implementing information security management which contributes to the trust and confidence of taxpayers in using the e-Filing system.

To ensure the continued excellence of the services offered, LHDNM constantly conducts post-mortem activities on the e-Filing system with the assistance of DigiCert Sdn Bhd. Various strategic improvements were planned to provide added value and convenience to taxpayers using the e-Filing system. Starting in 2012, the Organisation e-Filing (OeF) has been introduced to allow an individual authorised under section 75 of the Income Tax Act 1967 to hold a digital certificate for the organisation. With the implementation of OeF, organisation tax submissions can be made via e-Filing using the digital certificate of the organisation.

Issues concerning "Password Reset" are among the frequent problems face by the users of the e-Filing system. In 2016 LHDNM introduced a new feature of the e-Filing system whereby in addition to the existing options, taxpayers were given a new option to reset the password via SMS. This new feature has been well received by the



The evolution of the BE tax form through the years

RESET E-FILING PASSWORD VIA SHORT MESSAGE SERVICE (SMS)

1. Taxpayers may reset their e-Filing password via Short Message Service (SMS) starting April 18th 2016.
2. This latest initiative introduced by the Inland Revenue Board of Malaysia (IRBM) allows taxpayers to apply for the Temporary Activation Code (TAC) using registered mobile phone numbers with IRBM.
3. However, TAC application method via SMS is only accessible to Maxis, Digi and Umobile users only. Other mobile subscribers will get to enjoy this facility in the near future.
4. Telephone service provider (Telco) will imposed a RM0.50 charge for every SMS notification received. TAC will be valid as long as taxpayers have not use it to reset their e-Filing passwords.
5. To reset e-Filing password using TAC, kindly visit IRBM official portal at www.hasil.gov.my > ezHASiL > e-Filing > Bantuan > Terlupa Kata Laluan or click the link below / click the following link: https://ez.hasil.gov.my/CI/Bantuan_Anon.aspx
6. IRBM hopes this new method will facilitate as well as encourage more taxpayers to file their Income Tax Return Forms (ITRF) using e-Filing.

The Reset Password Via SMS feature was introduced to the public in April 2016

taxpayers due to its prompt and automated service.

Along with the latest trends and encouragement from a new generation of users, LHDNM introduced a new initiative in 2012 known as m-Filing which was launched by the Malaysian Prime Minister, YAB Dato 'Sri Mohd Najib Tun Abdul Razak on Hari Hasil, 1st March 2012. M-Filing is an alternative method of sending e-Forms through mobile devices that can be performed from any location and at any time without having to download any additional software or applications. This initiative increased the potential usage of the e-Filing system to



become available on millions of taxpayers' mobile devices.

Moving forward in 2015, LHDNM further embarked on its enhancement of the e-Filing system by introducing ez.Hasil, a centralised interface to facilitate taxpayers accessing all the e-services provided by LHDNM within one simple dedicated webpage.

These carefully formulated strategies and enhancement to the e-Filing system have directly helped to increase the e-Filing statistics over the years. Overall, the success of e-Filing and the corresponding initiatives around the system have indeed helped to produce a positive impact on state revenue collections which certainly contributed to the benefit of our society at large. [STV](#)

e-Filing

- 1 Login Kali Pertama
Gunakan No. Pn untuk Daftar di Sisi Digital
- 2 Login e-Borang
Pilih Borang & to Makluman
- 3 Pendaftaran Secara Digital dan Hantar
- 4 Pengelesen Penerimaan

Mudah Tepat Selamat

PENGUMUMAN

PENAMBAHBAIKAN KATA LALUAN

Mulai 1 Disember 2015, Kata Laluan mesti 8 hingga 12 aksara, kombinasi abjad dan nombor seperti di bawah:

- Sekurang-kurangnya satu (1) huruf besar.
- Sekurang-kurangnya satu (1) huruf kecil.
- Sekurang-kurangnya satu (1) nombor.
- TIDAK mengandungi aksara khas atau simbol.

(Contoh : pAssword123)

Log Masuk

Sila masukkan No. Rujukan (No. Pengenalan) dan Kata Laluan. Klik Hantar.

No. Pengenalan

No. Kad Pengenalan Baru
 No. Pasport
 No. Tentera
 No. Polis

[Login Kali Pertama](#)
[Terlupa Kata Laluan](#)

Perlu bantuan?
 1-800-88-5436 (LHDN) / +603-7713 6666 (Luar Negara)

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The End Of An Era For Print Newspapers?

Do traditional newspapers still have a role in a world that has moved online?

Markus Lim
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The Independent, The Daily Telegraph, News Week, these are among the big and famous newspapers that boasted legions of readers and followers from all over the world.

These respective and reputable publications came with immense reputations, proud heritage and not forgetting a dynamic editorial board in conveying ground-breaking stories to the masses. Through their reporting, these massive reputations sent shockwaves to all quarters be it politicians, big corporate companies or individuals.

Hence, what is so unique about newspapers? In hindsight, they uphold the values and tradition of transparency, truth and openness and not just mere reporting as compared to other publications. Certainly, such elements have attracted readers from all segments and this perhaps explains why such publications are in high demand.

Nevertheless, the print newspaper is at a crossroad more so with the emergence of various social media platforms and the ever-powerful internet. The internet is rapidly evolving into a universal conduit that is overturning the media status-quo.

Traditional media such as newspapers and magazines have to reassess their role for the Internet. Newspapers are no longer competing with each other in their locality but from all over the world. Considering these developments that are shaping the industry, newspapers should reassess their core business and adapt to the changes or face a very uncertain future.

The newspaper industry has been facing challenges to its role for quite some time now. It is a fact that newspaper circulation has been on a downward trend for

several years. According to a report in The Economist, circulation of newspapers in Great Britain has been falling for the past three decades. Various reasons were attributed to the steep fall, but one reason that stands out the most were the demographic change of reading habit.

The changes witnessed were not unexpected. Rather, it is in line with the current trends which witnessed the tendency of readers to opt for digital platforms to obtain vital information.

UNDERSTANDING READERS' CHOICE

First, readers' choice has evolved. These days, readers wanted news on immediate basis. The faster the better! In this context, what other platforms can promise and provide such delivery of news if not the social media platforms? Readers with access to social media can afford to surf the latest or breaking news in real-time, anytime and anywhere in the world.

Readers can access the news via their own tablets, mobile phones or even through their Twitter feeds. Microsoft founder, Bill Gates once said that readers now prefer to read news online because it does not involve any cost.

Another factor which also contributed to this development is the type of news offered in the publication. As the old saying goes, content is king! More often than not, political news can influence the perception of the readers. They will reject such publication should the publication fails to play its role. In short, readers crave for publication which can provide them with the best content.

TREND IN MALAYSIA

Similar trends are seen here as well. The role of the Internet and social media has changed the newspaper industry in the country forever. Currently, news contents can be obtained in various platforms. You have the print version, online version, Twitter, Instagram and also Facebook.

According to a report issued by the Audit Bureau of Circulation (ABC) on newspaper circulation in Malaysia, it experienced a stark contraction for the first six months of 2015 as compared to the same period in 2014. The report revealed the downward trend happened in all major publications namely the Malay, English and Mandarin newspapers. The downward trend continued in 2016.

For example, period between 2013 till 2015, figures by ABC indicated that circulation of four Malay newspapers and their Sunday editions, namely Utusan Malaysia, Berita Harian, Kosmo and Harian Metro, dropped to around 40,000 copies per day. This is by far the worst drop faced by Harian Metro and Metro Ahad. Circulation for Harian Metro and Metro Ahad in 2015 fared badly to 217,000 copies for Harian Metro and 237,000 for Metro Ahad.

One of the oldest English newspaper in Malaysia, New Straits Times (NST) was not spared either. For the first six months of 2015, its total circulation in the market only reached a mere 55,586 copies for its daily edition while for its weekend edition, it was up slightly to 66,944 copies.

NEWSPAPERS	TOTAL CIRCULATION (2015)	TOTAL CIRCULATION (2016)
Utusan Malaysia	162,639	144,438
Mingguan Malaysia	340,953	313,495
Berita Harian	103,953	90,969
Berita Minggu	-	89,978
Kosmo	194,900	182,022
Kosmo Ahad	205,717	198,116
Harian Metro	217,384	149,253
Metro Ahad	237,722	162,091
New Straits Times	55,886	44,090
New Sunday Times	66,941	51,768
The Star	272,066	248,559
The Sunday Star	274,046	244,053
The Edge	23,921	23,295
China Press	159,975	149,969*
Sinchew Daily	352,357	328,930*
Guang Ming	73,756	64,607*

Total circulation (January-June 2015, January-June 2016),

*not including night edition

Source: Audit Bureau of Circulations, 2015 & 2016

However, all is not lost yet. The same report by ABC also revealed that three other publications namely Kosmo, The Star and Sinchew suffered only some minor drops in terms of circulation for the same period last year.

Kosmo for example, successfully maintained its circulation to almost 195,000 copies a day while its weekend edition circulation soared to 205,000 copies. Both The Star and Sinchew newspaper also maintained its grip with 274,000 and 352,359 copies respectively.

NEWSPAPERS WHICH WENT ONLINE

NEWSPAPERS	DETAILS
The Independent UK	<ul style="list-style-type: none"> Founded in 1986 Final print edition on 20 March 2016 Online version commenced in April 2016
NewsWeek	<ul style="list-style-type: none"> Founded in 1933 Last print edition in 2012
Lyold' List	<ul style="list-style-type: none"> Started operation since 1726 Last print edition in Sept 2013
AsianWeek	<ul style="list-style-type: none"> A weekly newspaper for Sino-America residents in San Francisco Started operation in 1979 Last print edition on 2 Jan 2009

Figure 1: List of newspapers which went online fully

WHAT'S NEXT?

In reality, the notion that the lifespan of print media in Malaysia may cease to exist is not as bad as first feared. Yes, the figures reported by ABC do not look very encouraging, but this challenging situation requires the owner and the editorial board of any newspaper company to think out of the box and perhaps come up with a different strategy to woo back the readers.

In the print media context, speed is their achilles heel. Although they may not be able to challenge the internet portals in terms of speed in delivering breaking news, the print media can utilise their strength – which is content – by delivering not only quality, reliable but also impactful news.

Yes, the element of speed or first in delivering the news is an essential barometer but it does not give an indication that it influences the peoples' choice in choosing their reading materials. Some readers love humanity stories; stories which can inspire and leave a lasting impact in their lives.

There is no doubt however that profit remains the crucial element that will determine the rise or fall of a newspaper company. But, is profit the only way forward for these newspapers owners? What are the long term plans to rebrand the publications? Perhaps they may have heard this popular phrase before "You lost the battle but you win the war." Quality or quantity? [my](#)

SCOREBOARD Communications & Multimedia



Postal and Courier

POSTAL TRAFFIC DOMESTIC LETTERS

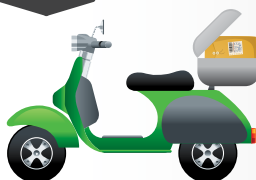
MILLION



2014 : 913.0
2015 : 851.3
2016 : 432.8

COURIER TRAFFIC DOMESTIC DOCUMENTS

MILLION



2012 : 30.1
2013 : 32.1
2014 : 33.4
2015 : 33.2
2016 : 21.0

NUMBER OF POST OFFICES



2014 : 961
2015 : 930
2016 : 925

NUMBER OF COURIER LICENCES



2014 : 91
2015 : 88
2016 : 103

POSTAL TRAFFIC DOMESTIC PARCELS

MILLION



2012 : 0.8
2013 : 0.7
2014 : 1.3
2015 : 0.8
2016 : 0.4

COURIER TRAFFIC DOMESTIC PARCELS

MILLION



2014 : 14.1
2015 : 18.2
2016 : 11.8

2016 Postal and Courier data is at 1H 2016

Cellular, DEL, SMS And Broadband

PENETRATION RATES: MOBILE CELLULAR PER 100 INHABITANTS



2014 : 148.3%
2015 : 143.8%
2016 : 141.6%

PENETRATION RATES: FIXED LINES PER 100 INHABITANTS



2014 : 14.5%
2015 : 14.6%
2016 : 14.7%

NUMBER OF SMS TEXT MESSAGES

BILLION



2014 : 49.3
2015 : 25.9
2016 : 12.0

PENETRATION RATES: BROADBAND PER 100 HOUSEHOLDS



2014 : 70.2%
2015 : 77.3%
2016 : 77.9%

2016 Cellular, DEL, SMS & Broadband data is at Q3 2016



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BEWARE WHAT YOU SHARE



NOT EVERYTHING
ON THE INTERNET
IS TRUE

- ✔ Be sceptical about the information you get.
- ✔ Always check the stuff your kids are sharing.

- ✘ Don't share stuff that is offensive.
- ✘ Don't let your kids share blindly just to get 'likes'.



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