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CONVERGENCE



MCMC

ISSUE 20



THE NATIONAL DIGITAL INFRASTRUCTURE PLAN

BRINGING HIGH QUALITY DIGITAL CONNECTIVITY TO ALL MALAYSIANS

- National Postal And Courier Industry Laboratory
- Enforcement Activities Under The Pandemic
- Developing An ASEAN Post Pandemic Digital Infrastructure Solution
- A Safe And Inclusive Digital Nation
- What Does It Take For A City To Become Smart? People!
- Parcel Lockers: The Solution For A Smart Future

The Malaysian Communications and Multimedia Commission

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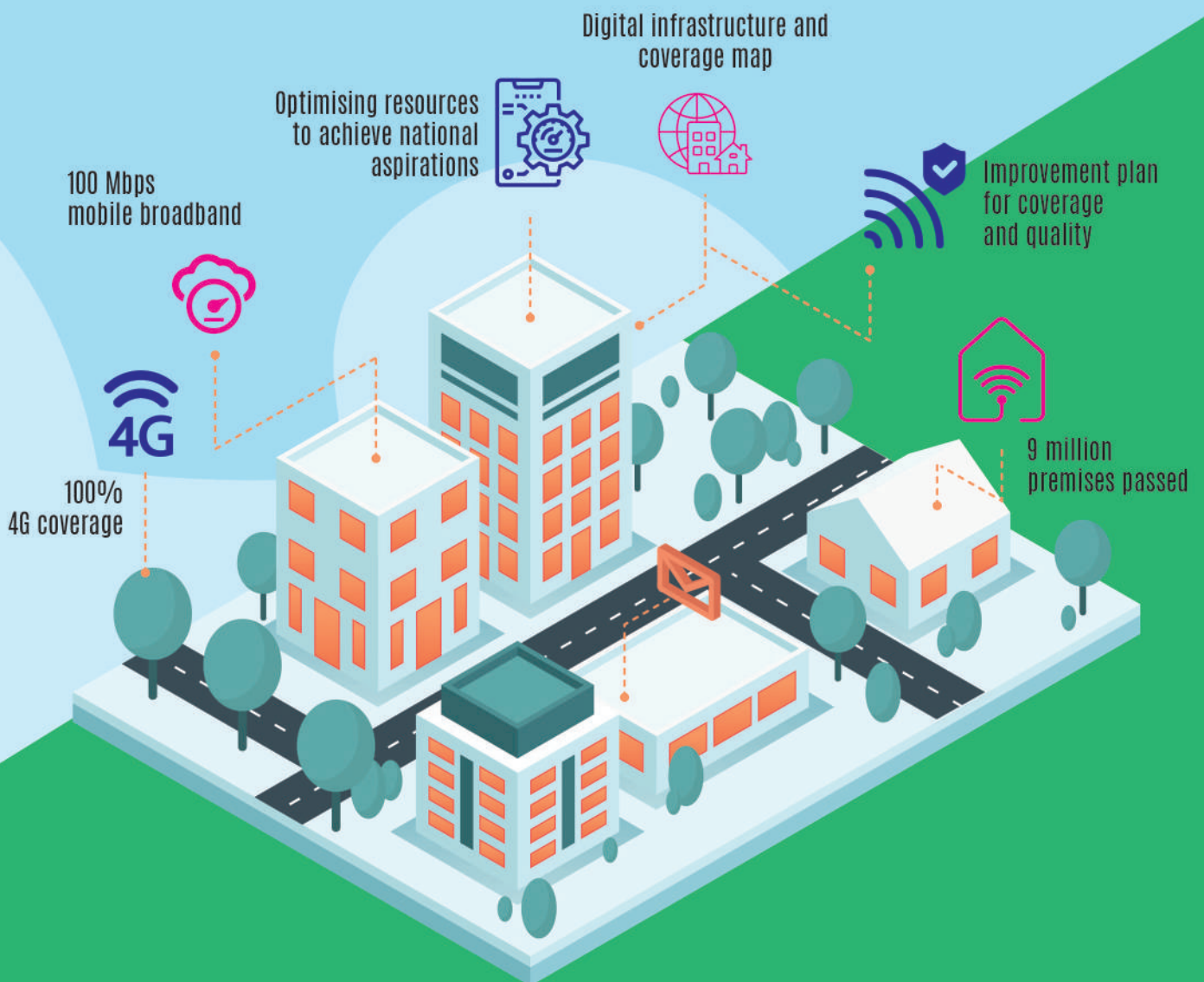


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CONNECTIVITY FOR ALL

The Jalinan Digital Negara (JENDELA) plan was formulated to provide wider coverage and better quality of broadband experience for the Rakyat, whilst preparing the country for 5G technology.



For more information, visit myjendela.my

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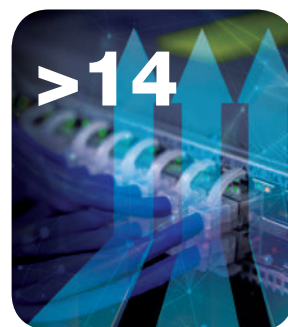
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From the Chairman's Desk

The pandemic really did a number on all of us this past year and at the time of writing, we are not out of the woods just yet. Working from home is commonplace, and students are still doing home based learning for now. We have embraced online shopping, as evidenced by the significant number of delivery riders out and about. All this has increased our reliance on the internet, and digital connectivity has become as important as water and electricity. As the regulator entrusted to shape Malaysia's digital landscape, MCMC is committed to improving the coverage and quality of digital connectivity through the Digital Infrastructure Plan or JENDELA. We are also diligently working towards revitalising the postal and courier industry as part of the nation's push towards the digital future.

JENDELA is documented in the cover story of this issue. 15 months into the pandemic, MCMC's efforts to expand digital connectivity throughout the nation as well as tackle other areas within its scope are well underway. These efforts have yielded good results, with many areas now having connectivity as well as improved quality of service. Readers can follow the progress of this plan through the reports that MCMC publishes on a quarterly basis.

The other issue that is closely related to the pandemic is appropriately called infodemic. The entire world, and Malaysia is no exception, is hungering for information on the health crisis. This has spawned torrents of disinformation and misinformation, leading to confusion, conspiracy theories and unfortunately even vaccination hesitancy. One feature in this issue is about the infodemic which amongst others, highlights the challenges faced in managing the infodemic in Malaysia.

We have also provided a glimpse into how MCMC undertakes its enforcement work in this issue, and even here, the impact of the pandemic has been keenly felt. However, MCMC has to carry on doing its job, and will continue to do so, notwithstanding these challenges.

We have also developed a plan to improve the performance of the postal and courier industry, another area that must quickly rise to meet the demands brought on by the rapid growth of the digital economy. The plan was developed through the National Postal and Courier Industry Lab (NPCIL) which ran over eight (8) weeks and which brought together 108 industry stakeholders in innovative and highly interactive sessions that resulted in good insights and recommendations to MCMC.

I hope readers will also find the other articles in this issue relevant and informative.

I take this opportunity to encourage everyone to continue to be vigilant and keep safe.

Warmest regards,
Dr Fadhlullah Suhaimi Abdul Malek



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JALINAN DIGITAL NEGARA (JENDELA)

BRINGING HIGH QUALITY DIGITAL CONNECTIVITY TO ALL MALAYSIANS

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The COVID-19 pandemic has changed the way people do things. It has created a higher reliance for the internet both in urban and rural areas.

During the Movement Control Order (MCO), which was implemented in 2020, 50% to 70% of internet traffic data was concentrated in the residential areas compared to before the MCO. The demand for broadband communication services has soared, with some network

operators experiencing 30% to 70% increase in internet traffic.

The Covid-19 pandemic has triggered an urgency for Malaysia to address the 'new norm' and cater for future demands of connectivity as an enabler for all facets of life i.e., the economy and people's livelihoods, education, business opportunities and building and connecting communities amongst others.

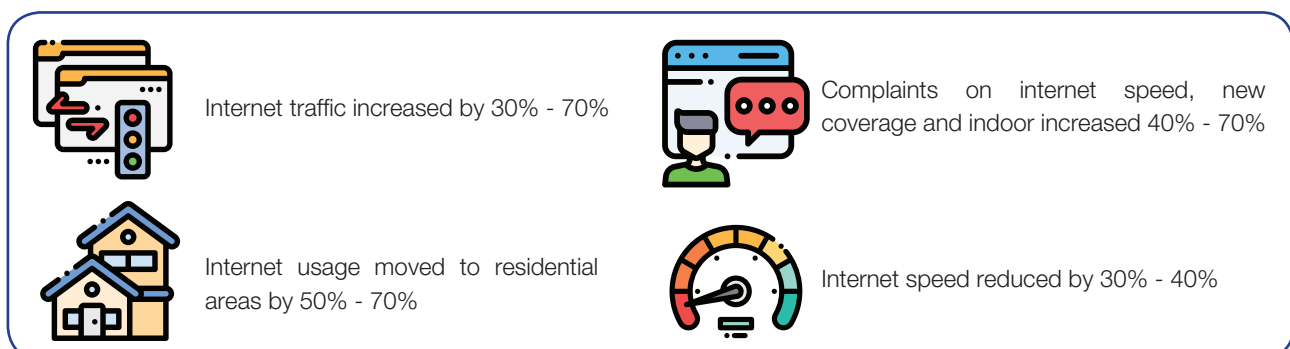


Figure 1: Internet patterns during MCO (Source: MCMC)

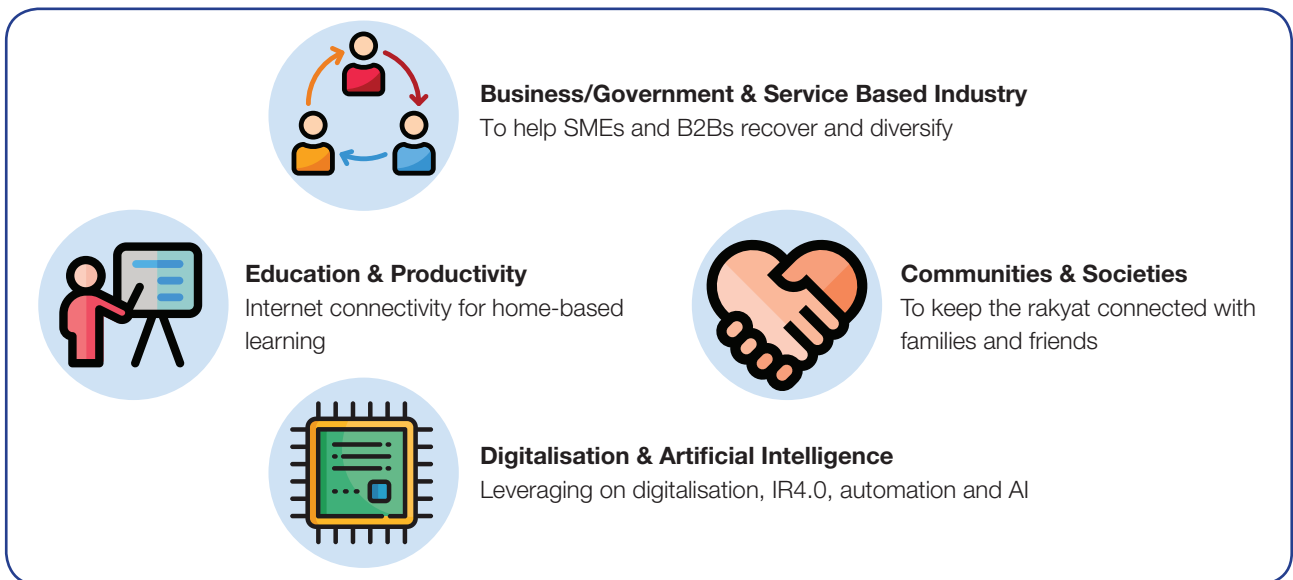


Figure 2: Internet as enabler

THE NATIONAL DIGITAL INFRASTRUCTURE LAB

A collaborative effort aspiring to deliver connectivity for all

MCMC had conducted the National Digital Infrastructure Lab (NDIL) from 13 July 2020 to 14 August 2020 with strong participation from the industry, government

agencies and relevant stakeholders with the aim to collaboratively address how to deliver quality connectivity to all Malaysians.

The NDIL has formulated a comprehensive Malaysia’s national digital infrastructure plan known as *Jalanan Digital Negara* (JENDELA). JENDELA aims to provide a comprehensive framework and high quality broadband

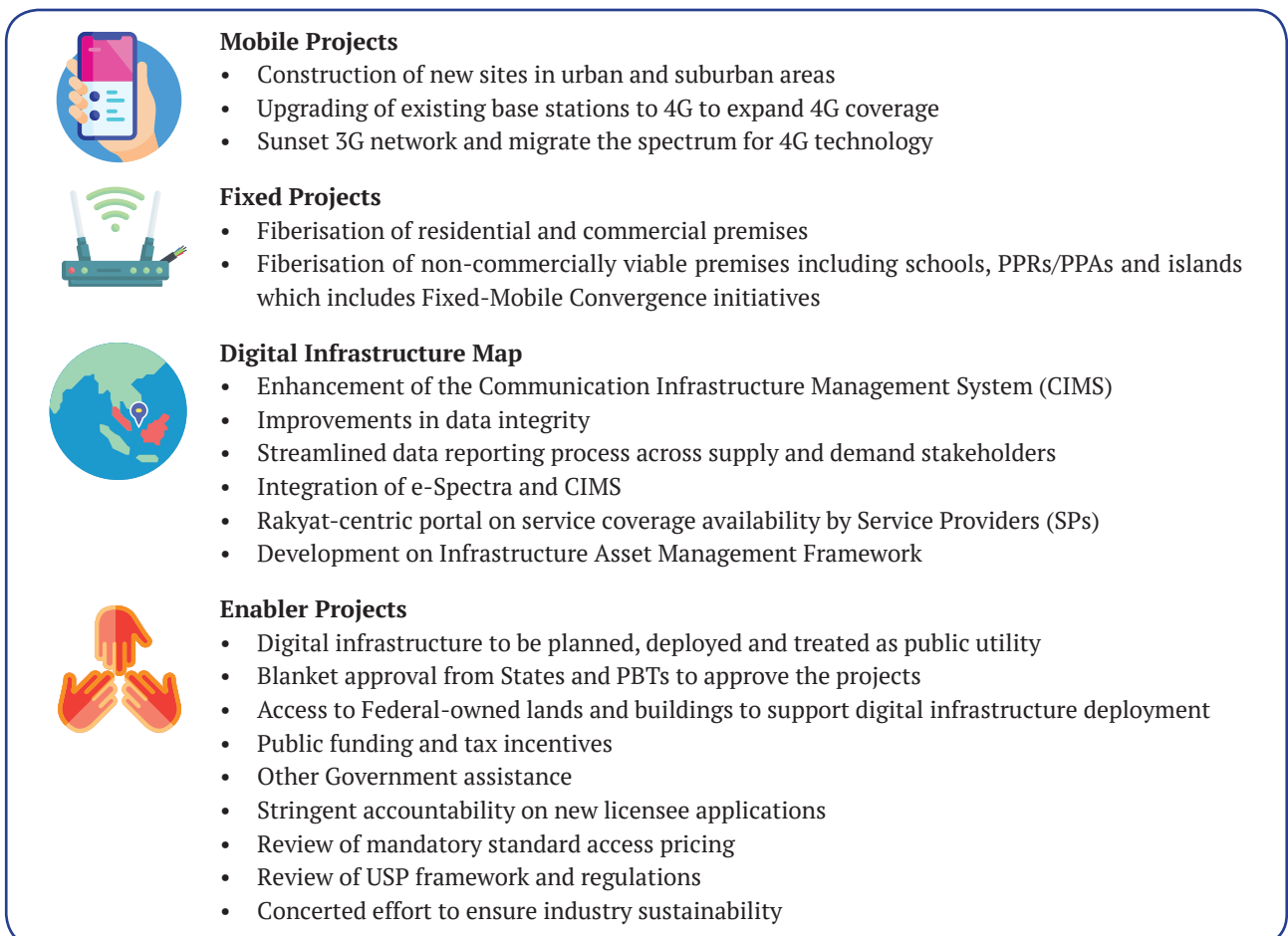


Figure 3: Digital infrastructure projects

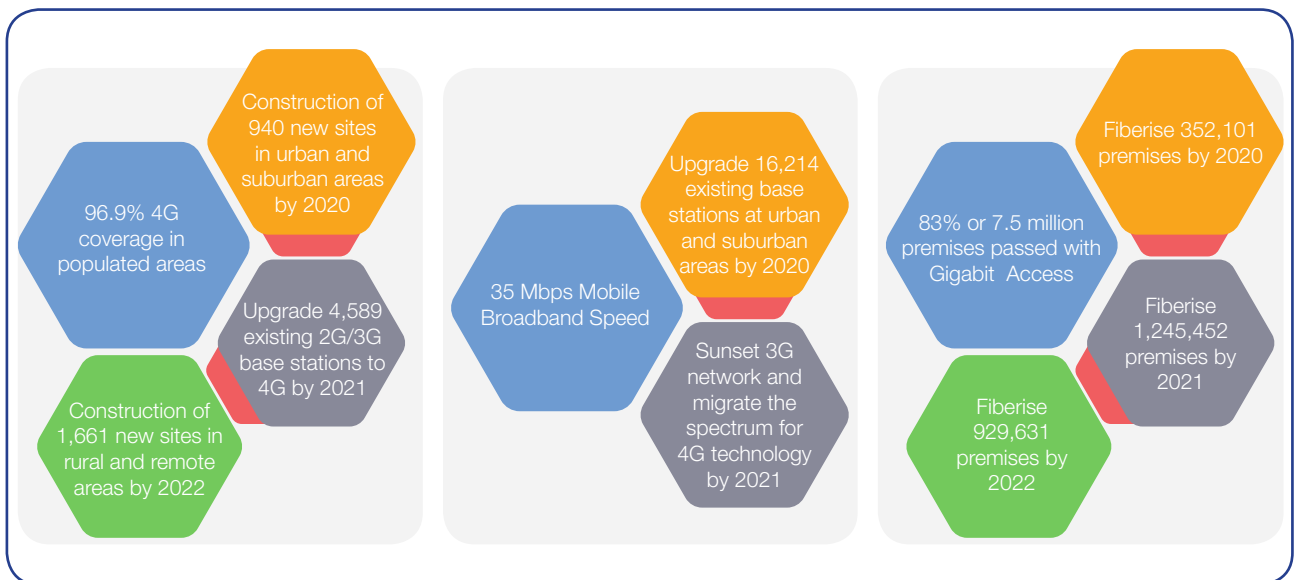


Figure 4: JENDELA Phase 1 targets.

coverage to meet the demands of the Rakyat. JENDELA is also a platform to accelerate the country's digital connectivity through widespread deployment of mobile, fibre optic and fixed wireless access while paving the way to 5G under the 12th Malaysia Plan (2021-2025). JENDELA will ensure all Malaysians will have access to quality digital connectivity and achieve national aspirations which are gigabit access to 9 million premises, 100 Mbps mobile broadband speed and 100% coverage in populated areas by 2025.

To achieve these aspirations, the lab recommended digital infrastructure projects which include mobile and fixed, National Digital Infrastructure Map and other enabler projects that support the delivery of the projects and initiative.

JENDELA was announced by the Prime Minister of Malaysia, YAB Tan Sri Dato' Haji Muhyiddin bin Hj Mohd Yassin on 29 August 2020 and is implemented in phases. The project has two phases with Phase 1 executed from 2020 to 2022 and Phase 2 from 2023 to 2025.

JENDELA PHASE 1 (2020 – 2022):

An accelerated improvement plan for nationwide 4G coverage and gigabit access

JENDELA Phase 1 started in September 2020 and is to be completed by end of the year 2022. Phase 1 will optimise existing resources and infrastructure for both mobile and fixed connectivity to meet the target that has been set. It covers the expansion of 4G mobile broadband coverage from 91.8% to 96.9% in populated areas, increasing mobile broadband speeds from 25Mbps to 35Mbps and enabling up to 7.5 million premises with access to gigabit speeds via fixed broadband services. This will also involve the

gradual shutdown of 3G networks until the end of 2021 and migration of the spectrum for 4G technology use as well as strengthening the foundation for 5G networks.

To achieve the targets, eight (8) mobile and fixed projects have been identified to achieve the targets of JENDELA Phase 1.

KEY POLICIES AND INCENTIVES

To support and expedite the deployment of digital infrastructure, there are also key policies and incentives that contribute to accelerate the project delivery to achieve the aspirations. Regular engagement with the State and Local Governments and relevant stakeholders will be continued to obtain their buy in to facilitate the development of digital infrastructure.

Non-standardisation of telecommunication application processes, fees and exclusivity practices

- Blanket approval from the State Governments and Local Authorities to expedite the infrastructure rollout and premises for the Rakyat to gain the coverage provided.
- Healthy competition that enable the providers to build more affordable services, accelerate digital infrastructure implementation and achieve service as well as operational excellence for benefit of consumers.

Improvement in developers' planning, state planning and development control

- Digital infrastructure to be planned, deployed and treated as public utility.
- Improving developers' planning to make sure communications is part of the plan.
- Ensuring building can accommodate digital infrastructures.

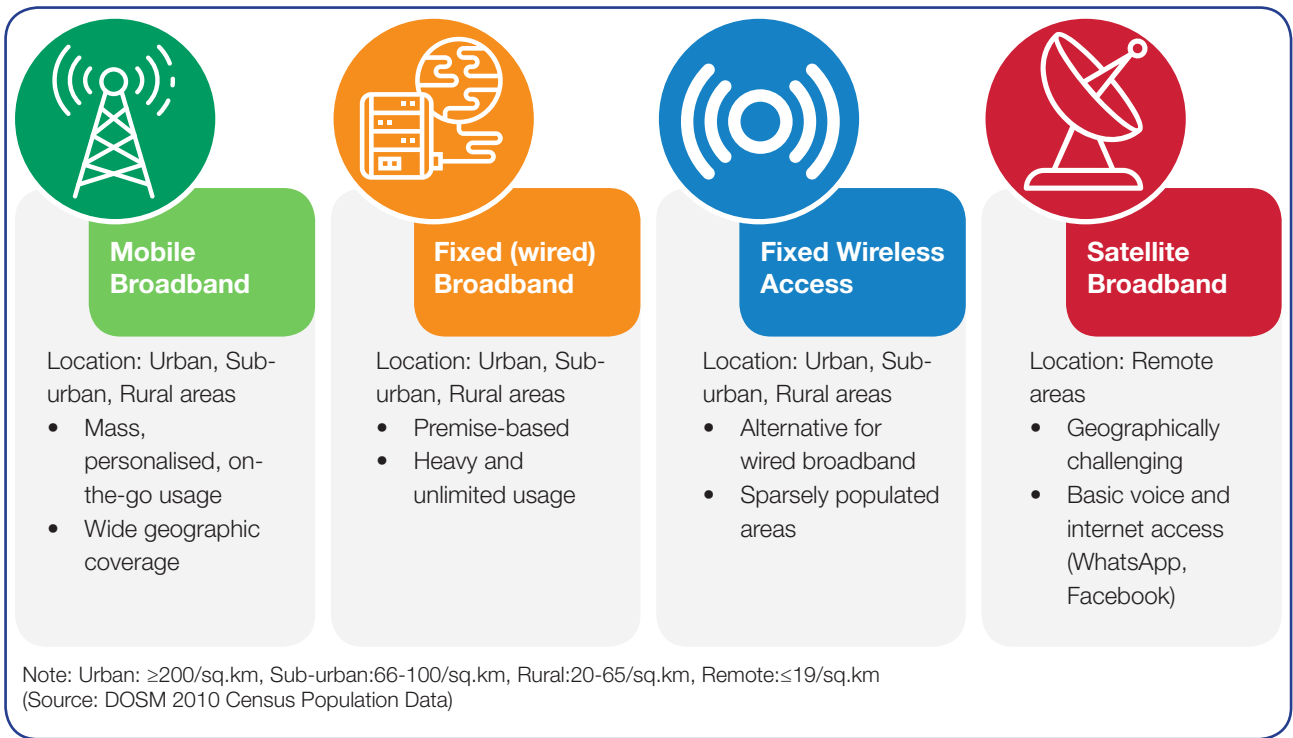


Figure 5: Fit-for-purpose solutions

Lack of guidelines and coordination for private sector to access suitable Federal-owned land and buildings

- Simplified, single window access to Federal-owned lands and buildings to develop digital infrastructure and expand coverage and quality.
- Central coordinator being a Government entity helps in terms of managing government sector entities.
- Lowering rental rate on federal lands and buildings.

Government Assistance

- Standardisation of electricity tariff for communications services based on industrial rates.
- Zero/Lower-interest loans for infrastructure in rural/remote areas.
- Funding for network provider to build international submarine cable at East Malaysia.
- Funding to fiberise State-backed companies (SBC) towers in suburban areas.

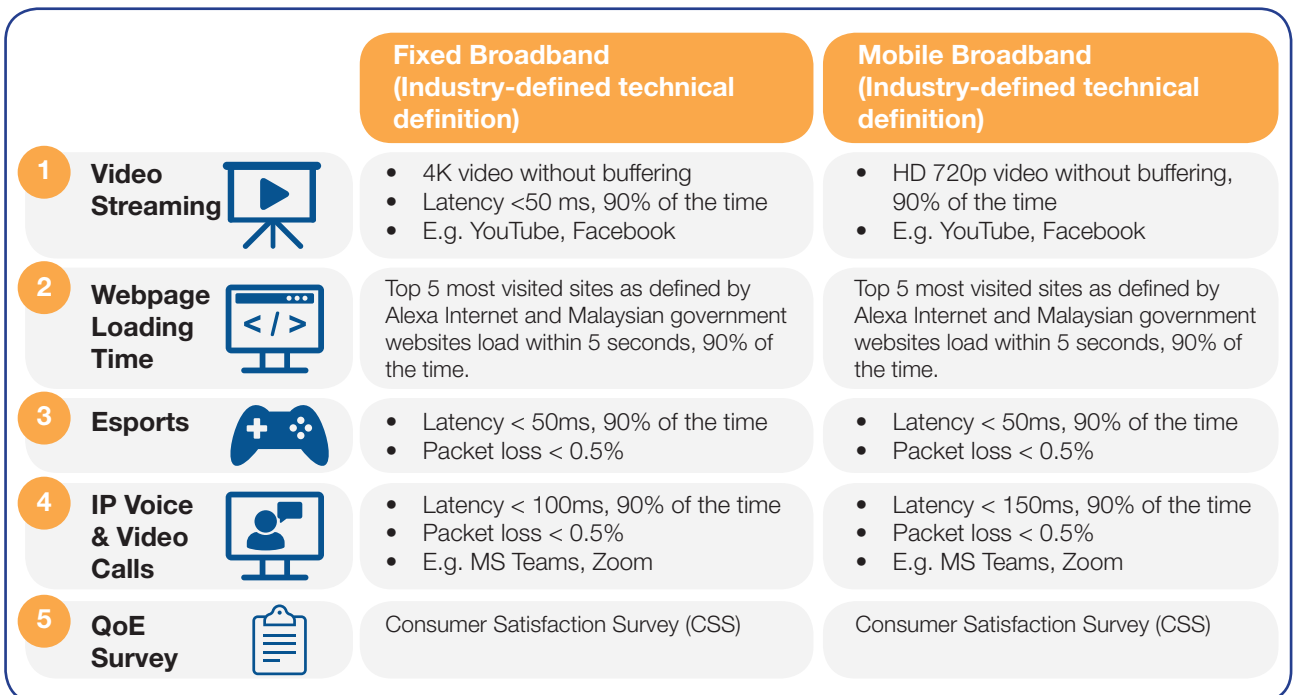


Figure 6: Quality of Experience (QoE)

JENDELA FOCUS:

Expanding coverage and enhancing Quality of Experience

To ensure the Rakyat can get the best experiences with the available technology solutions, fit-for-purpose solutions are planned to deploy in different areas to maximise broadband connectivity.

JENDELA is not only focusing on expanding the coverage but also on ensuring that the Rakyat can experience the improvement in the quality. Quality of Experience (QoE) is important to ensure service providers maintain the expected level of service quality to safeguard user experience and satisfaction.

JENDELA MAP:

A comprehensive view of all existing and planned infrastructure

Having a comprehensive understanding of a network's topology is vital. To ensure proper planning and underpinnings of Malaysia's digital connectivity strategies, a one-stop digital infrastructure databank is currently being established under JENDELA to create insights into the current state of digital infrastructure and availability of digital connectivity for the Government, regulators, service providers and the Rakyat. With the databank, coverage issues and speed gaps for fixed and mobile could be addressed as well as reduce duplication of infrastructure planning by the service providers.

Digital infrastructure mapping is being practiced by other countries such as Australia (Western Australia), United Kingdom and France. These cover comprehensive digital infrastructure data, buildings, economics, and demographics. The public can access the interactive

online map of the locations of digital infrastructure and information on coverage and providers.

With developed nations as benchmarks, the Communication Infrastructure Management System (CIMS) will be further enhanced with inputs from the service providers and local governments. Service providers will provide existing and planned infrastructure mapping and service mapping which include details such as fibre optic routes, node locations, capacity and usage, wireless infrastructure, ground/switch/cable landing stations and other information. Meanwhile, the local governments will provide input on population data, buildings and its addresses, planning and land use, as well as insights and data from related ministries and government agencies.

With the comprehensive mapping, the JENDELA Map will benefit the Rakyat and service providers for better consumer experience and planning. In July 2021, the Jendela Map Portal went 'live' as a one-stop centre for Rakyat to obtain information on the availability of infrastructure in their respective areas.

The Jendela Map Portal will provide a holistic consumer experience on the service coverage availability for fixed and wireless by specific premises, coverage by technology and by service providers and also the demand of service requirement and consumer complaints. With the JENDELA Map Portal, a consumer could check the availability of any fixed or mobile broadband services available at a particular location. The system will be able to show services that are available at the location and who the service providers are. If there is no coverage, the consumer could lodge a request to the service providers and they must update the requester on the status of the request for coverage/network expansion.

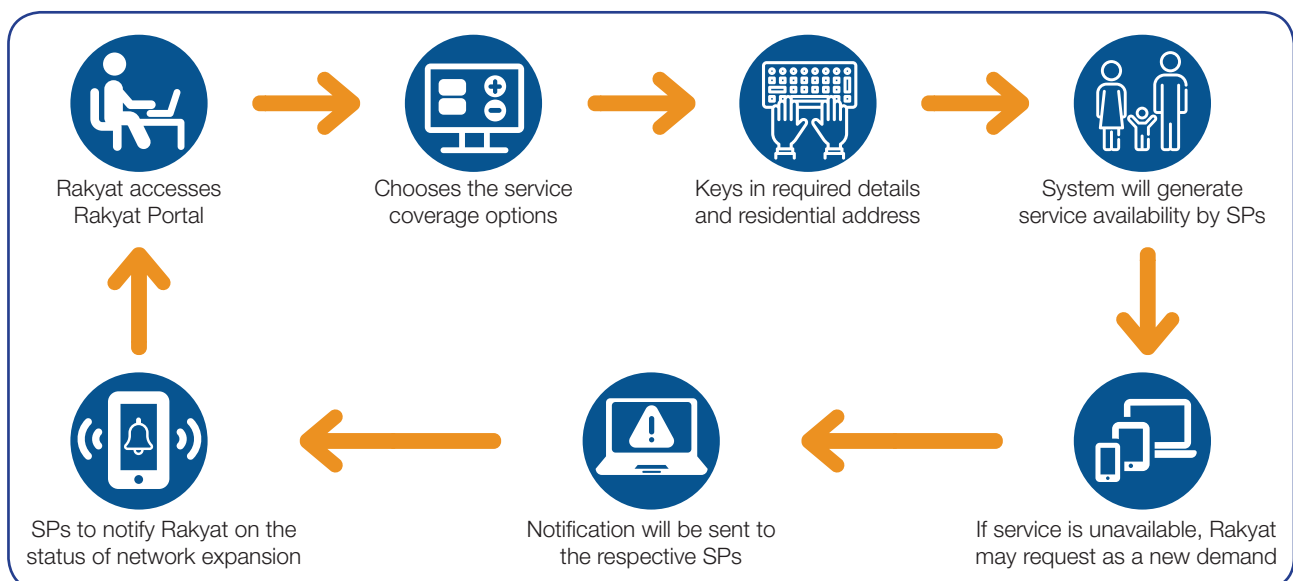


Figure 7: JENDELA Map Portal

JENDELA PHASE 2 (BEYOND 2022):

Address the Digital Divide via Broadband Wireless Access (BWA) and pave the way for 5G

Phase 2 of JENDELA involves utilising Broadband Wireless Access (BWA) and other fit-for-purpose technologies to address further gaps in the digital divide, as well as priming for the nation's eventual adoption of 5G technologies which will take place once action plans under Phase 1 are achieved. It is also in line with the planning under the 12th Malaysia Plan.

In addition, the use of other technologies such as satellite and FWA will also be considered to ensure all people can enjoy access to broadband network across the country. This is especially for underserved areas with challenging geographical surfaces where the cost of providing fibre connectivity as well as the construction of communication towers is very high.

The government and industry will continue to educate the public on the potential of 5G and its capabilities, through use cases applied across verticals such as manufacturing, agriculture, education, healthcare, security transportation, consumer experience, environment and smart city development. These use cases will continue to be explored under the 5G Demonstration Projects (5GDP).

JENDELA ASPIRATIONS:

A realistic and progressive digital connectivity plan to realise Digital Malaysia

JENDELA to ensure that Malaysians have access to quality digital connectivity and further achieve national

aspirations by 2025: 9 million gigabit access to premises, 100 Mbps mobile broadband speed and 100% coverage in populated areas by 2025. This is a shared aspiration for the whole country, driven by the Ministry of Communications and Multimedia (KKMM) and MCMC in partnership with the telecommunications operators, and other agencies at the federal, state, and local council levels. The industry believes that collaboration among all parties is crucial to facilitate infrastructure rollout in a coordinated manner, with minimal impact on civil works, the public, the environment, and all aspects of the ecosystem.

COMMUNICATION

To foster awareness and educate the public about the JENDELA initiatives, a website (myjendela.my) was launched in November 2020 as a platform for the government to interact with the public on the activities carried out under the JENDELA initiative. Various information can be found on the website such as JENDELA activities, target and aspirations, reports, interviews, talk shows and press releases published in the media.

JENDELA GOVERNANCE:

Effective Monitoring and Programme Management

JENDELA governance structure is required to resolve issues and provide direction to service providers on moving forward plans. Program Management Office (PMO) has been established in MCMC to effectively monitor and ensure project implementation within the focus areas. PMO is working closely with project owners and supporting government authorities.

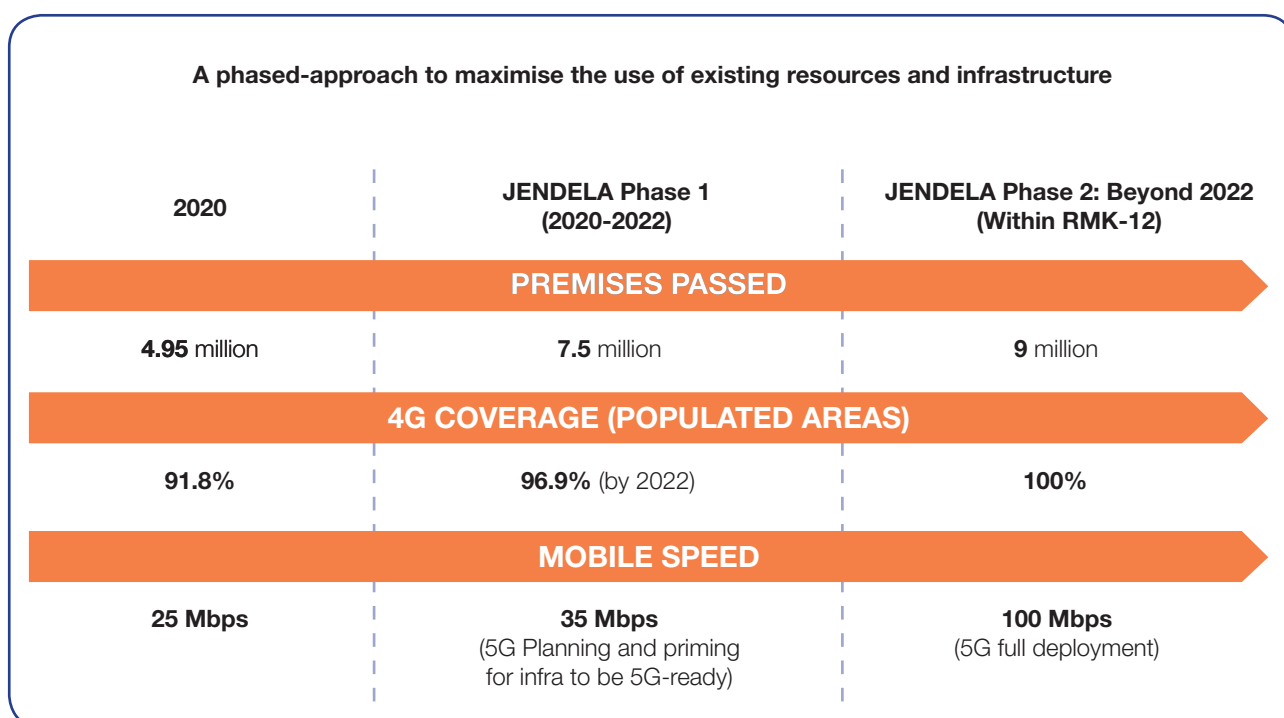


Figure 8: Phased approach

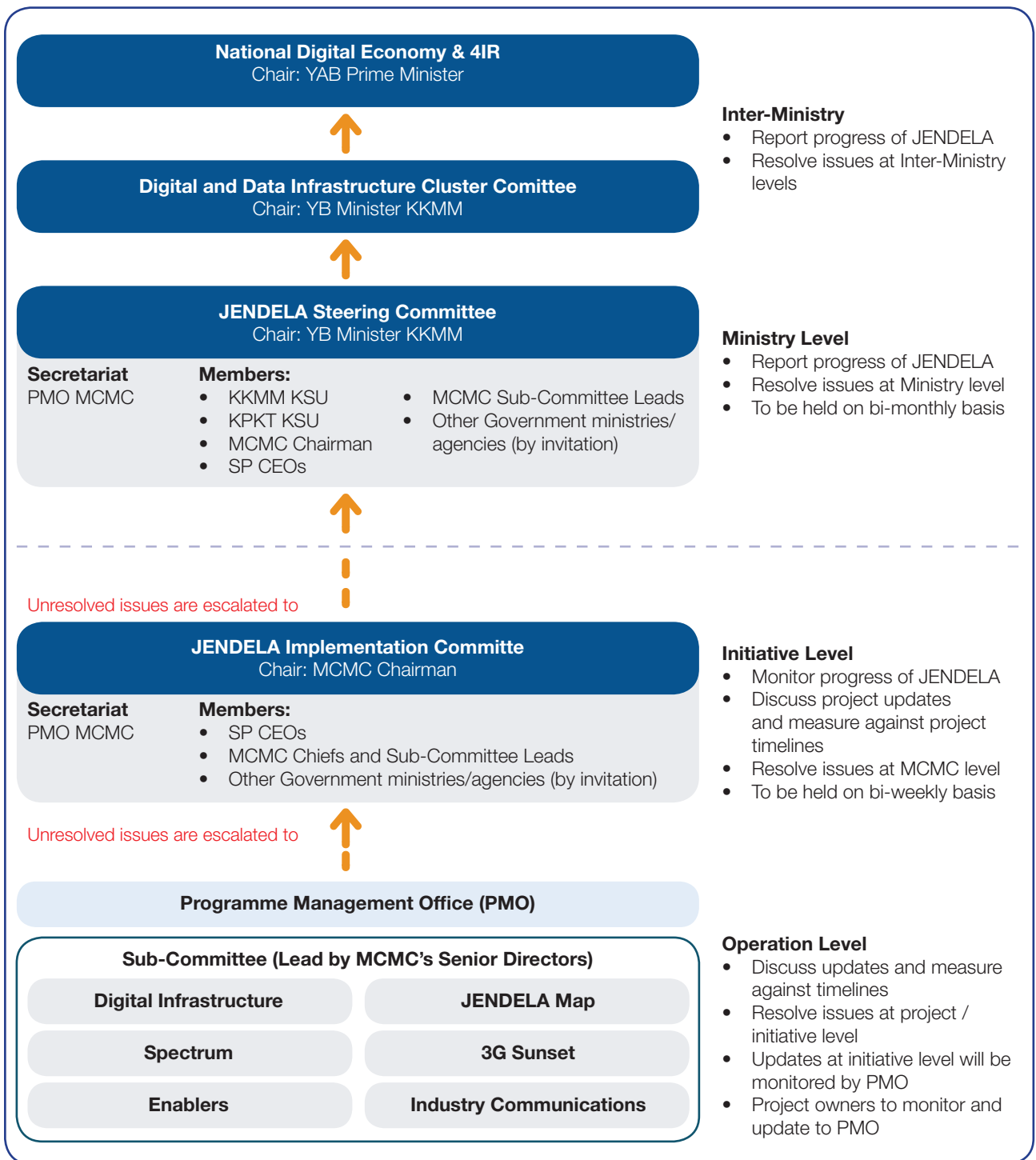


Figure 9: JENDELA governance structure

JENDELA governance structure consist of:

- Six (6) sub-committees led by MCMC's Senior Directors to discuss updates and resolve issues at the project level;
- JENDELA Implementation Committee to monitor the KPIs, projects updates and measure against timelines, resolve issues at MCMC level; and
- JENDELA Steering Committee to resolve issues and provide facilitation at ministry level.

Further escalation required will be channelled up to the National Digital Economy and 4IR Council chaired by YAB Prime Minister. [my](#)



A SAFE AND INCLUSIVE DIGITAL NATION

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Technology and digitalisation have been hot topics for the longest time, but recent developments including the far-reaching effects of the pandemic have accelerated the importance of having a truly digital nation. The implementation of the national digital infrastructure plan, JENDELA, the recognition of internet as the third utility and the recently launched Malaysia Digital Economy Blueprint (MyDIGITAL) puts Malaysia en route to become a digital nation, leading digital economy by 2030 and provide a better living standards for the *rakyat*.

In acknowledgement of the nation's digital aspirations, Digi Telecommunications Sdn Bhd (Digi) as a digital services and connectivity provider believes that connectivity is the core for building a digital Malaysia with equal and safe access to the internet for all. Digi, through its Yellow Heart commitment has already embarked on various efforts to empower every Malaysian, especially the underserved communities, and bridge the gaps that currently exist to ensure that in the long run no one is left behind. Ultimately, it is digital inclusion of the community that form the building blocks that can lead us to realising the vision of becoming a sustainable digital nation.

CULTIVATING DIGITAL AND FUTURE SKILLS

Talent is a country's most precious resource because economies grow when they develop and deploy their people in ways that maximise their productive potential,

more so in the digital economy. To fully reap the benefits of digital technology, Malaysia needs to first and foremost have digital talents and for this, there must be equal opportunities to learning and education. Proper education is a strong element of social change as it can provide knowledge, skills as well as inculcate thinkers that can bring about socio-economic progress.

One of the biggest disruptions brought about by the pandemic is the abrupt shift to e-learning when remote schooling was a previously uncharted territory for many students. Despite Malaysia being recognised as one of the most digitally connected nations in the world with 91.7% of the population being an internet user in 2020¹, students, teachers and parents were caught unprepared with the lack of digital learning resources, connectivity issues and device readiness.

Cikgu Julie Mozianda bt Ahamat, a teacher with 14 years' experience who taught the Basic Computer Science (ASK) and Computer Science (SK) subjects, found the transition difficult at first, but soon realised it was an opportunity for teachers and students alike to expand their digital creativity and familiarity.

She observed that students were more engaged during face-to-face learning as they could directly communicate with teachers and their peers, and they were able to quickly adapt to the different mediums. "The pandemic challenged us teachers to become more creative in engaging with our students and we took the chance to experiment with



Digi's Head of Sustainability, Philip Ling distributes Micro-bits to students at PIK

different digital tools and teaching methods to appeal to students. With e-learning, students are able to learn at their pace anytime they wish, even at night or after hours, but of course all this is only made possible with the availability of devices and strong connectivity.”

In hindsight, it was a timely strategy in 2019 when we launched a digitalisation strategy to support teachers and students in e-learning and especially to nurture interest in future skills since young. Digi embarked on the three-year Future Skills for All partnership with the Malaysia Digital Economy Corporation (MDEC) and United Nations International Children’s Emergency Fund (UNICEF) to digitalise the RBT, ASK and SK modules and conduct teacher trainings to facilitate digital lessons.

Under the programme, Digi has also distributed micro:bit starter kit sets to Pusat Internet Komuniti (PIK) and equipped the centres’ teachers with relevant digital skillsets to guide students and level the playing field for the underserved ones.

Cikgu Julie, having used the micro:bit sets in her classes, said digital tools and hands-on learning allow students to grasp key concepts faster and help them to adapt to newer technology easily. She found that students displayed higher interest in learning new programming languages and were also more creative in attempting new projects such as programming robots or musical instruments.

Cikgu Julie is just one of hundreds of teachers to benefit from this initiative and has expressed the need for continuous support so that students, especially those in underserved groups, are not left behind. While the industry comes together to accelerate e-learning, the plight of underserved students over the past year centered

largely around the lack of internet access and digital devices, hindering their participation.

Digi strongly believes in the power of technology to remove inequalities and develop the next generation of digital talent. In response to these inadequacies, the company has teamed up with the industry for the #MYBaikHati initiative to jointly crowdsource and provide underserved students with refurbished devices that can allow them to access digital education and opportunities to upskill.

PLEDGING DIGITAL INCLUSION THROUGH CONSISTENT NETWORK

A country is only as strong as its most vulnerable members. The pandemic emphasised the urgency to narrow the digital gap and become more resilient, and further highlighted the importance of connectivity in everything we do.

Hence the implementation of JENDELA, an accelerated industry-wide initiative to expand and improve the quality of 4G network and fibre connectivity throughout Malaysia. JENDELA also serves as a bedrock for 5G technology as the country prepares for a digital future.

As part of the team and force driving the government’s targets for JENDELA, we ramped up our nationwide network upgrades which were already well underway and, have achieved 100% of planned new sites in Q1 of 2021. As landscape, demand and consumption continue to evolve, the exercise remains an active task and we are steadfast in maintaining, upgrading and expanding our network as part of our commitment to deliver internet for all.

The pandemic proved to be a stress test for the industry with the surge in connectivity demands and became a stronger impetus for telecommunication companies to ramp up their efforts to connect people to what matters most. Digi, like all connectivity providers, had to increase its network capacity to support online learning, productivity and entertainment



Digi's network team on-site strengthening 4G network

¹ <https://www.bernama.com/en/business/news.php?id=1951263>

while ensuring families, communities and societies stay connected with each other.

To increase accessibility and support Malaysians amid challenging times, the industry rolled out various initiatives to ensure the nation is sustained with seamless connectivity during the various stages of the Movement Control Order to tide over all their now-digital activities. We began with offering free 30GB monthly productivity internet nationwide as well as implemented free 4G WiFi at several People's Housing Projects (PPR) in five states to facilitate online learning and work for the lower income families.

These efforts proved fruitful as we saw the nation achieve 93.51% 4G coverage as reported for Q1 2021 JENDELA report compared to 91.8% before JENDELA kickstarted. With more aggressive plans to improve coverage network and quality of service, Malaysia is on the way to achieving 100% 4G coverage in populated areas by 2025.

IMPROVING ACCESSIBILITY FOR THE DIFFERENTLY-ABLE COMMUNITY

As the nation digitalises, vulnerable groups may find it challenging to keep up. In addition to providing tools and connectivity for the underserved communities, we began to empower the differently-abled community, especially persons with disability (PWD), in granting them opportunities to become digitally-ready so they are not left behind. The PWD community deserves to equally benefit and contribute to a digital nation and as such we made it a point to improve accessibility to technology and to the internet. Greater accessibility to technology enhances their knowledge, creates opportunities and enables them to compete to become active and effective contributors towards nation-building.

The registered figure of those who are impacted by visual impairment currently stands at approximately 400,000, but this does not account for members of the public who may not be aware of their own visual impairment, regardless of how small.



Facilitating e-learning through increased accessibility at PIK for students.



Figure 1: Importance of accessible digital touchpoints infographic

In addressing this matter, we have sought to improve the levels of accessibility of its digital touchpoints (Figure 1) and this includes ensuring that the content, design and technology of the digital platforms are compatible with screen readers, incorporating features to lower barriers to access, presented in a simpler manner and matches the international standards for website and mobile applications.

Through this ongoing initiative, we hope to inspire the next and encourage more corporates to review their touchpoints to make the internet a more accessible place for all. The update on accessibility touchpoints may seem insignificant to the majority, but it goes a long way to help the differently-abled community gain the independence they seek. This in turn makes them digitally-ready to embark on realising their dreams, whether it is becoming small business owners, or simply tackling everyday challenges that the able-bodied take for granted.

RAISING RESPONSIBLE DIGITAL CITIZENS AND STRENGTHENING RESILIENCE

With great power comes great responsibility; and the onus lies on all of us to wield the internet safely and responsibly. Alongside digital skills, we need to push digital resilience and advocate for responsible digital usage – that is to equip Malaysians with the skills to use

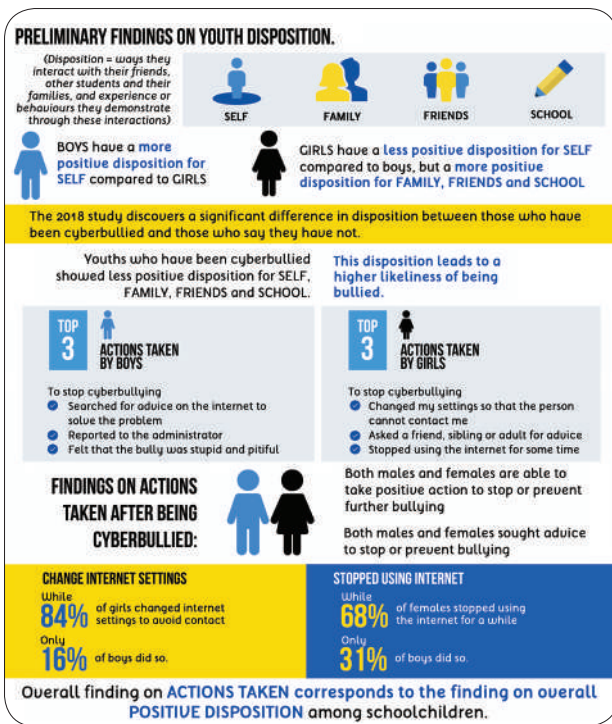


Figure 2: YH Cyberbully Disposition Survey 2018

the internet for good. A digitally-capable community is one that is prepared to navigate the digital space safely and responsibly while possessing the literacy and skills to contribute to the development of the nation.

Digital resilience awareness is especially important for the youth, as Digi's Yellow Heart Cyberbullying and Youth Disposition Survey (Figure 2) found that 20% of youth in Malaysia attested to being bullied online for more than a year, and at least 42% knew of someone who had undergone the same experience.

Youths, who are in their formative years, are subject to influence from external factors, thus it is crucial to educate and create a strong support system for them. Their immediate social environment comprising an ecosystem of parents, teachers, schools, local municipals and federal policymakers are pivotal to effectively identify signs of cyberbullying and equip them with knowledge to protect themselves online.

This year we celebrate our 10 year anniversary in keeping Malaysians safe on the internet as we kickstarted more programmes such as launching our Safe Internet resource site and running a scam awareness campaign reaching out to Malaysians of all ages and partnering with relevant bodies to drive home the message of being discerning, responsible and resilient while using the internet.

SAFEGUARDING DATA PRIVACY

At the same time, the more we embrace digitalisation, the more we have to be mindful of safeguarding data privacy. MyDIGITAL also touches on digital privacy in its blueprint as the pandemic and its resulting data boom has accelerated awareness and scrutiny of data privacy rights.



Figure 3: Simplified privacy notice infographic

The responsibility of safeguarding data privacy lies with both the companies and the consumer themselves. Companies must first be responsible data custodians and ensure they have a culture of data protection in every level of the organisation. For example, our priority is to ensure the security of our customers' data by constantly updating our security measures according to the latest regulatory guidelines and in accordance with our Responsible Business Conduct policies.

Consumers on the other hand should keep their personal and sensitive information safe and secure – and this starts with knowing your rights. Digi maintains transparency by simplifying our privacy notice and creating infographics for easier comprehension (Figure 3). Transparency gives customers the power to share only data they are comfortable in sharing.

In conclusion, investing in people and infrastructure to achieve a digital nation is crucial. Malaysia has made significant progress over the past decade and with the current policies and implementation of JENDELA and MyDIGITAL we are well on track to unlock the full potential of technology in enabling the economy. To keep up with the pace of digitalisation and technological change, leaders, businesses and citizens need to work together to create a resilient and dynamic ecosystem that can push us towards a better tomorrow. [my](#)

MALAYSIAN FIXED BROADBAND MARKET IS PRIMED FOR GROWTH

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Fixed broadband household penetration in Malaysia was only around 33% at end 3Q 2020 which leaves very significant room for growth in forthcoming years. A number of factors can serve to change dynamics in the Malaysian fixed broadband market over time and increase household penetration. Government backed broadband rollouts incorporating FTTP and fixed wireless coverage increases, the longer-term impact of the pandemic and greater diversity of fixed broadband providers will all help shape the fixed broadband market. This article outlines how we see the likely evolution of the fixed broadband market in Malaysia.

Telekom Malaysia's fixed broadband net additions were 149,000 in 2020 compared to -50,000 in 2019. Even in the longer run the pandemic may serve to reinforce the value of having a fixed broadband connection at home and this trend is part of the reason we are bullish about the prospects for fixed broadband growth in Malaysia.

Affordability challenges are unlikely to represent any significant drag on growth in fixed broadband subscriber numbers, thanks to implementation of the Mandatory Standard on Access Pricing (MSAP). The incumbent's entry level unlimited fibre plan with 30Mbit/s speeds costs

EXISTING TRENDS MEAN THAT THE MALAYSIAN FIXED BROADBAND MARKET IS PRIMED FOR GROWTH

We are bullish on the prospects for growth in the Malaysian fixed broadband market and forecast that subscriber number increases will be robust throughout the next few years (Figure 1).

The pandemic has already had an impact on the trajectory of the fixed broadband market. As in many countries fixed broadband net additions increased in Malaysia in 2020, driven by greater home working and schooling. For example,

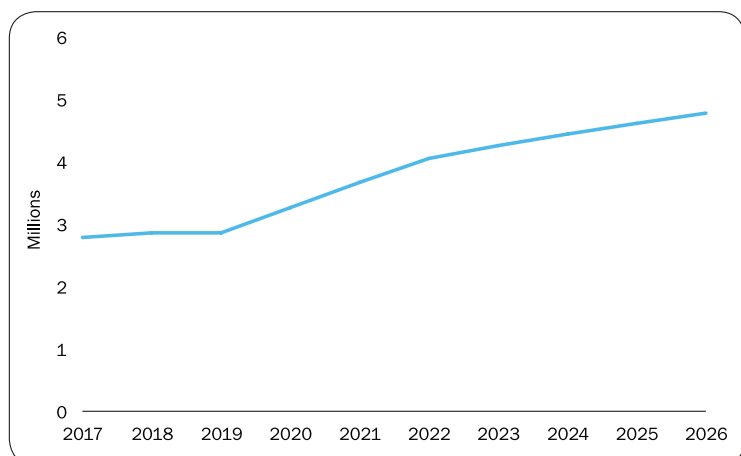


Figure 1: Malaysia, fixed broadband connections, 2017-2026
(Source: Analysys Mason, 2021)

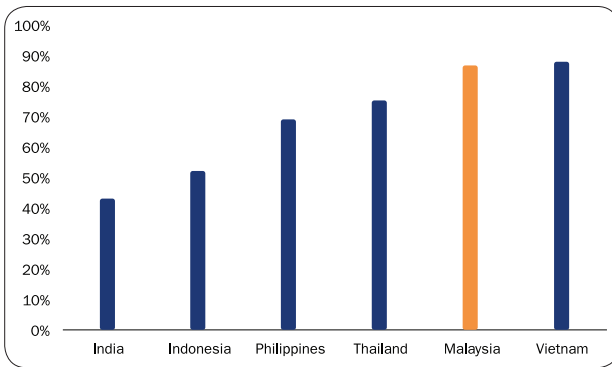


Figure 2: FTTP coverage of total country premises at end 2026, selected countries (Source: Analysys Mason, 2021)

MYR89 (USD21.5). In 2019 the average monthly household income of the bottom 40% of households in Malaysia was MYR3,152 (USD762) according to data from the Malaysian Department of Statistics and so the price of the entry level retail fibre plan only represented 2.8% of average monthly household income for this group. In other markets we see examples where households are prepared to spend 5% or even a slightly higher proportion of their monthly income on a fixed broadband connection.

FTTP COVERAGE INCREASES AND A GREATER RANGE OF FTTP ISPS WILL DRIVE FIXED BROADBAND GROWTH

The Jendela plan means that by the end of the forecast period in 2026 we forecast FTTP coverage of 87% of Malaysian premises. We forecast that this will leave FTTP coverage levels in Malaysia at the same or higher levels than many peer countries (Figure 2).

The more widespread availability of better quality FTTP broadband is likely to tempt some mobile only households to take fixed broadband and this is a trend that has been seen in many countries. There is also an increasing diversity of suppliers offering FTTP in the Malaysian fixed broadband market, for instance, because of the implementation of the MSAP. The desire of MNOs to find a new revenue stream is an important driver for growing competition in the Malaysian fixed broadband market. MNOs may use fixed-mobile retail bundles to drive fixed broadband adoption and this could serve to stimulate growth in fixed broadband subscriber numbers. We forecast that the proportion of fixed broadband subscriptions that are part of FMC bundles in Malaysia will increase from 15% at end 2020 to 38% at end 2025.

FIXED WIRELESS WILL HAVE A ROLE TO PLAY IN THE MALAYSIAN FIXED BROADBAND MARKET

In Malaysia, the Jendela plan is not unusual in

incorporating the use of wireless technologies which will account for the final 13% of premises. National broadband plans in many other countries are making use of fixed wireless and satellite technologies. The NBN in Australia covers the final 7% of premises with fixed wireless and satellite. In New Zealand, the various government-subsidised UFB FTTP roll-outs are planned to cover only 87% of premises and beyond this the Rural Broadband Initiative supplies customers with fixed wireless or upgraded copper. The Rural Digital Opportunity Fund (RDOF) in the USA is another programme that allows for the use of non-FTTP technologies.

Outside of the most rural areas in Malaysia there is also scope for fixed wireless to grow, particularly as ADSL subscribers look to migrate to newer technologies. However, in terms of performance fixed wireless will not match that offered over FTTP networks. Mid-band 5G fixed wireless rollouts have begun to proliferate globally and real-world download speeds are likely to be in the hundreds of Megabits per second, at least with lightly loaded networks, rather than the Gigabits that FTTP can offer. The very high cellular data traffic levels in Malaysia also mean that MNOs may wish to conserve spectrum for mobile applications rather than for fixed wireless and this also helps explain why Malaysian MNOs have increased their focus on offering FTTP. We forecast that fixed wireless will represent 11% of total Malaysian fixed broadband connections at end 2026.

MIGRATING THE VERY LAST DSL SUBSCRIBERS MIGHT PRESENT SOME CHALLENGES

In terms of DSL subscribers we anticipate that all ADSL broadband subscribers in most markets will have been migrated to FTTP or FWA between 2025 and 2028. Demand led migration can serve to significantly reduce the number of remaining ADSL customers but migrating the very last remaining customers could be challenging. For example, Singtel announced in September 2017 its intention to decommission its copper network in April 2018. At the time of this announcement, Singtel's DSL base represented 8% of its overall fixed broadband base. Singtel did not meet its aggressive switch-off target and still had 20,000 DSL subscribers as of the end of April 2018, equivalent to around 3% of its overall base. It was only at the end of 2019 that it reached a total of 1,000 DSL subscribers. In Malaysia we forecast that at the end of 2026 no DSL subscribers will remain. [my](#)

JOHAN ISHAK

WINDS OF CHANGE FOR TV

Johan Ishak is somewhat synonymous with TV and the creative industries. Having gained deep knowledge of media operations and business transformation, he shares his journey and his thoughts on the future of TV.

Tell us a bit about yourself and how you ended up in the TV and creative industry.

I am a chartered accountant by training. Before coming back to Malaysia, I worked in Australia, USA and UK. Then I headed the finance team in Media Prima. From there I became CEO of MyCreative Ventures. Then back to TV as CEO TV 3, TV9, NTV7 and 8TV. Today, I am the Managing Director of Awesome TV.

What was the aim of MyCreative Ventures and please share some of your achievements and projects there?

The Malaysian creative industry faced the problem of

not being able to get loans from the conventional banks. Therefore, as an affirmative action by Ministry of Finance to address the matter, MyCreative Ventures was created to fund creative businesses via loans and equity financing. Later I created two more subsidiaries MyCreative namely R!UH, an arts market and showcase platform for the Malaysian creative industry and Cendana which gave out grants to the creative industry as well as lobbied for change of government policies related to the creative industry.

You were CEO at Media Prima TV. What was the TV industry like then? What were some of the major things you worked and oversaw there?

The TV industry was severely affected by Google and Facebook where 50% of what used to be TV advertising revenue was going to Facebook and Google. I did some restructuring that turned Media Prima TV from a loss of RM200 million to profit in 2020. We democratised TV onto

digital platforms where TV3 Malaysia YouTube became the No. 1 YouTuber in Malaysia garnering 150 million views per month and tonton.com.my became the No. 1 TV streaming platform in Malaysia for the mass market. Also, we pioneered Digital Terrestrial TV together with MCMC and MYTV.

Share a bit about TV and creative industry and the various associations and groups around that you have contributed to.

I was Chairman of Creative Content Association Malaysia (CCAM) from 2018 to 2020. Also Chairman of myFreeview from 2018 to 2020. Also served in the exco at Global Entrepreneurship Movement (GEM) from 2015 to 2017.

On the arts side, under the National Art Gallery, I was the Chairman of KL Biennale from 2017 to 2018 as well as Chairman of Young Arts Entrepreneurs (YAE), 2015 to 2017.

I also served as Lecturer at Film, Theatre and Animation Faculty (FITA) at UITM from 2015 to 2017.

You're now at Awesome TV. What is this venture all about? How is it going? What can viewers look forward to?

Awesome TV is a new free-to-air TV station that is available on Astro Channel 123 and MYTV Channel 112. It is also available on digital at awesomeTV.my. It is just into 8 months of operation and we have managed to reach the ranking of No. 2 Station for mass Malay audience nationwide.

The DNA of our content includes genres such as drama, movies, comedy, talk shows, Islamic and kids. Content is both locally produced as well as from Hollywood, Bollywood, Korea, Thailand, Indonesia and many more.

Over the years, you have witnessed the changing landscape of TV, globally and especially in Malaysia. What has changed over the years, where do you see it going and what are your thoughts on how TV in Malaysia can continue to play a part of Malaysians' viewing time?

TV viewership has increased by 40% in the past couple of years achieving 22 million eyeballs residing in 7 million households nationwide. Research shows that even millennials are joining their older family members to watch TV despite the popularity of digital devices. This shows that content is king. However, TV advertising has diluted whereby 50% has gone to Facebook and Google.

Facebook and Google record their revenue outside Malaysia hence depriving the government of necessary tax collection for the nation. This is also having a detrimental effect on the economics of the local TV industry. The


TV viewership has increased by 40% in the past couple of years achieving 22 million eyeballs residing in 7 million households nationwide. Research shows that even millennials are joining their older family members to watch TV despite the popularity of digital devices. This shows that content is king. However, TV advertising has diluted whereby 50% has gone to Facebook and Google.

Government must emulate what other countries have done to protect the local industry, similar to the steps taken by Singapore, Australia, Korea, China and many more.

Piracy is also a big issue where 40% of the legal content economy has been plundered by pirates. The Government must take action or else piracy will become a deadly cancer to the industry.

How can local content producers remain relevant?

Firstly, TV industry players need to identify new sources of revenues. They must embrace technology not just because of customers' sake, but also for the sake of revenue. Secondly, there needs to be a lean cost structure. Processes must be nimble and workforce must be without wastages. The last thing a business needs is having fixed costs that are too huge to be recovered from any contribution margins of its portfolio of projects.

In the TV sense, what this means is that advertising revenues less programme costs must be adequate to cover fixed costs as well as acceptable profit margin. If outsourcing functions are cheaper, then, difficult but honest decisions must be made to replace existing workforce with an outsourced partner. Other options would be automation and shared services. Thirdly, there needs to be a pragmatic approach in targeting the audience that matters as far as making money is concerned. Values in the eyes of the customers may not be the same as values in the eyes of the suppliers. TV channels cannot produce programmes that they like. They must produce programmes that the viewers want even if the TV stations disagree with it. 

A REGIONAL POST PANDEMIC DIGITAL INFRASTRUCTURE SOLUTION TO REVIVE ASEAN'S DIGITAL ECONOMY

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With the steady rollout of Covid-19 vaccination programs, countries around the globe are priming themselves for a post-pandemic economic recovery. One crucial aspect of the recovery process is the deployment of vaccination passports -- a document attesting that the bearer has been vaccinated, tested negative, or had just recovered, and therefore unlikely to catch and spread the virus.

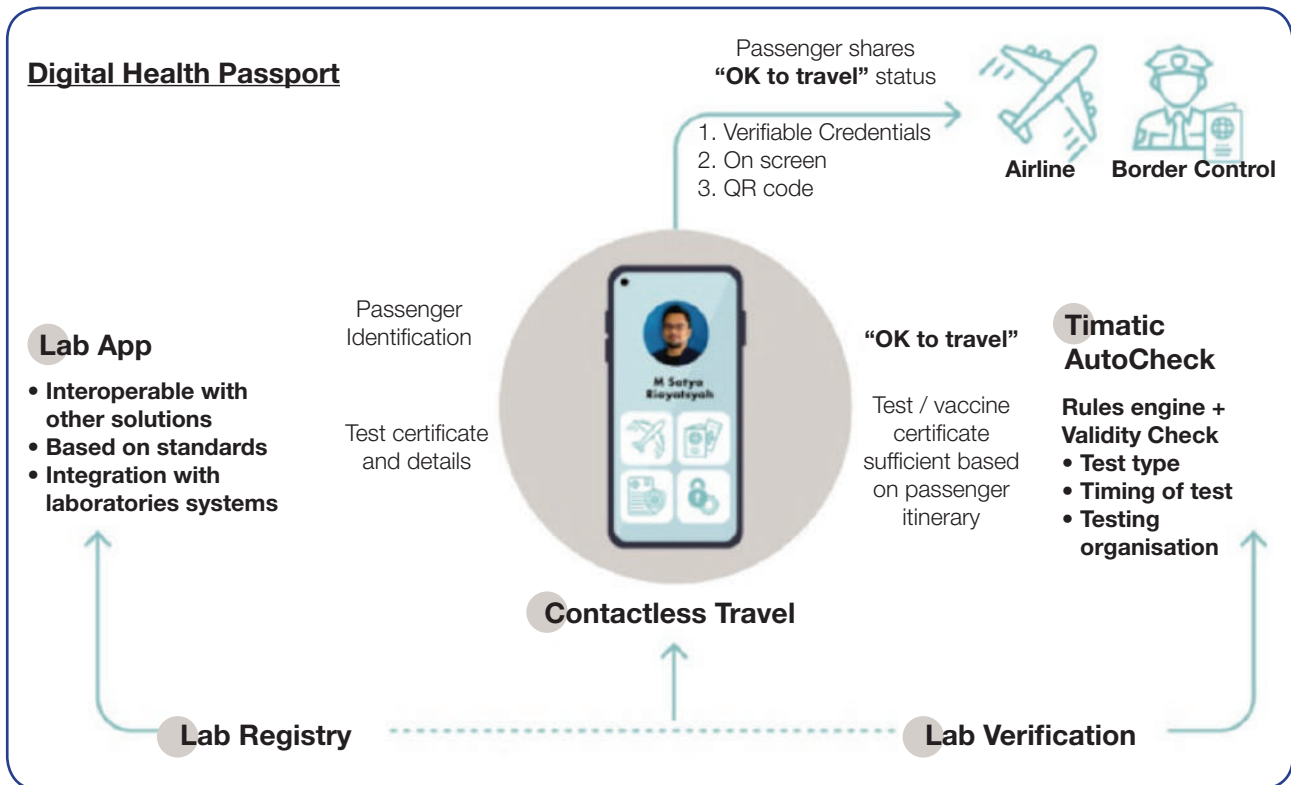
Physical passports, however, are no longer suitable in this post-pandemic era. Why? Because vaccination documents have limited time validity. Those who have tested negative or recovered can just as quickly catch the virus soon after. It would be far more sensible to develop a digital inoculation-record system that is easily updateable in real-time. Then there is the fact that paper documents can be easily forged or falsified; Thomson Reuters Foundation reported a “booming market for fake Covid-19 vaccination passports”. Hence, governments worldwide are considering adopting a digital equivalent of a vaccination passport, also known as a Digital Health Passport (DHP). Singapore, Japan, Germany, and China are just some countries already issuing DHPs to enable international travel. Unlike traditional passports, DHP information is relatively hard to tamper with, up-to-date, and accessible anytime and anywhere via an internet connection.

In ASEAN, members are currently weighing on DHPs for regional use. During an ASEAN Economic Ministers meeting held on 3rd March 2021, representatives from the ten ASEAN member states stressed the need for a smartphone application that would store updated inoculation records for travel. The action plan was part of the effort to revive the region’s ailing tourism sector hit hard by the pandemic. Reuters reported losses of as much as 100 billion ringgit in 2020 for Malaysia alone. The government is already kick-starting its 10-year recovery plan for the industry that signifies that DHPs are required fast.

Consequently, the development of DHPs has been relatively rapid. This April, the Malaysian health passport app *Immunitie* successfully validated its first live passenger traveling from Kuala Lumpur International Airport to Changi Airport Singapore. Once the passenger has tested for Covid-19, the results are then electronically stored directly onto a public blockchain, which the Immigration department in Singapore then accesses through QR codes.

DATA SOVEREIGNTY AND DIGITAL INFRASTRUCTURE

By design, DHPs store medical records and sensitive information. For DHPs to achieve their intended purpose, however, the system needs to securely transmit and



The Digital Health Passport scenario in air travel

store highly confidential personal data from different countries. At best, users are concerned about the privacy and protection of their data as it passes across borders. At worst, it poses a significant national security risk. This issue has far-reaching implications; affected are medical privacy laws, cross-border healthcare providers, immigration departments, and foreign relations.

Such circumstances have prompted discussions around data sovereignty and data localisation. Data sovereignty is a concept where personal information is subject to the laws and governance structures within the nation it is collected. Data localisation refers to a regulatory requirement for any entity that processes the data of any given country's citizens to store that data on local servers within the country's borders. Recently, discussions surrounding data sovereignty have taken a new note catalysed by the Covid-19 pandemic. As of March 2021, approximately 100 countries have some form of existing data sovereignty laws. In Malaysia, they are the National Policy Objectives of Communications and Multimedia Act 1998, the National Cyber Security Policy (NCSP) 2006, and the Personal Data Protection Act 2010. Collectively, they encompass a comprehensive cross-sectoral framework to protect personal data in commercial transactions while at the same time ensuring information security, network reliability and integrity, and secure and resilient infrastructure. It is interesting to note that some of our ASEAN neighbours implement some of the strictest data sovereignty laws in the world. Brunei, Indonesia, and Vietnam have specific requirements for data to be stored on servers within the country itself.

While existing policies are sufficient in serving as a framework for local organisations and corporations, it did not anticipate a transnational initiative on a scale as large as a region-wide DHP program. If an intra-ASEAN travel bubble were to establish, the circumstances would require each ASEAN member to organise its data localisation center in each foreign country to obtain the health passport of the citizen of interest.

While this method strictly adheres to the existing data sovereignty policies, it is an inefficient and potentially dangerous way to store and share sensitive data. **Every single pull request or connection established between two sovereign data centers is a potential vulnerability that can be subject to cyberattacks.**

One way to address this issue is to establish a collectively-owned ASEAN digital infrastructure recognised by all ASEAN members. Therefore, each citizen's data is maintained within the borders of their respective country and managed and handled by a single neutral third party. That third party must have the best interest of each nation in mind. One solution would be a consortium of the region's ICT solution providers working together on a single platform. It would be the means of the establishment of a highly secure cross-border digital infrastructure. But forming such a consortium would take a considerable amount of time and effort. Added is the inevitable bureaucracy issues and red tapes -- in every nation involved--using an established platform would be the best strategy in managing the race for economic survival. One such platform that already exists is ACASIA Communications Sdn. Bhd.

CONNECTING ASEAN AND BEYOND

Moving forward, the establishment of a single platform will provide three distinctive benefits compared to the status quo:

1. Better data protection and security

Data breaches and cyberattacks are increasingly prominent global issues. A 2020 IBM Security report stated that the average cost of a security breach per organisation in ASEAN had reached an all-time high of US\$2.71 million, with the time taken to identify and contain the attack being 287 days. Both figures are steadily increasing every year.

A unified digital infrastructure limits the number of parties involved in the data management process, thus reducing the risks of internal leaks or data breaches. It is also easier to establish a secure and stable connection between digital infrastructures set up and managed by a single entity, thus reducing downtime risks and improving data security.

2. Faster speeds and improved efficiency

Despite being part of the same regional body, each ASEAN member state has unique requirements and challenges when setting up digital infrastructures. It is essential to tap into the expertise of each leading provider of each ASEAN member to ensure that the

infrastructures adhere to regional standards while fulfilling local regulatory requirements.

Having a unified body overseeing the installation of digital infrastructure will also ensure that the components of the system are standardised and compatible from one country to the next. It will help reduce technical and bureaucratic inefficiencies resulting in a much more streamlined operational workflow, faster connectivity speeds, higher savings, and infrastructure longevity.

3. Higher security due to private blockchain

Having sensitive data managed by a single entity makes it easier to secure the data using private blockchain technology. Unlike a public blockchain where the data stored is transparent and immutable, a private blockchain is an invitation-only blockchain governed by a single entity.

The participating parties (ASEAN members) require exclusive permission to read, write or audit the blockchain, making it difficult for nefarious parties to access highly confidential data illegally. Private blockchains also have several levels of user authentication, which ensures a higher level of security, privacy, and performance.

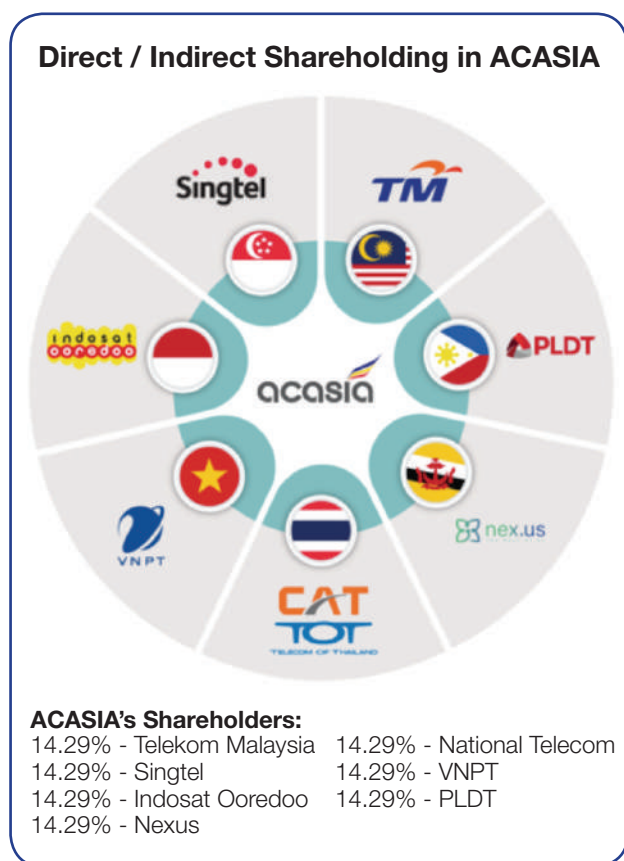
The opportunities stemming from a unified region-wide digital infrastructure are not just limited to specific projects such as DHPs, but potentially unlock further commercial and social opportunities that were previously unimaginable. Such a digital infrastructure would be the backbone in a region-wide open financial data repository, the center that houses confidential data used by international organisations, or the leader in driving sustainability projects within the region. For example, companies that require data recovery centers at strategic locations outside of their respective country but within ASEAN borders would greatly benefit from the system. This contingency step seems quite wise now in the advent of Covid-19. The ASEAN Digital Masterplan 2025 has explicitly stated two desired outcomes (DO) associated with this venture:

DO 5: Increase in the quality and use of e-government services

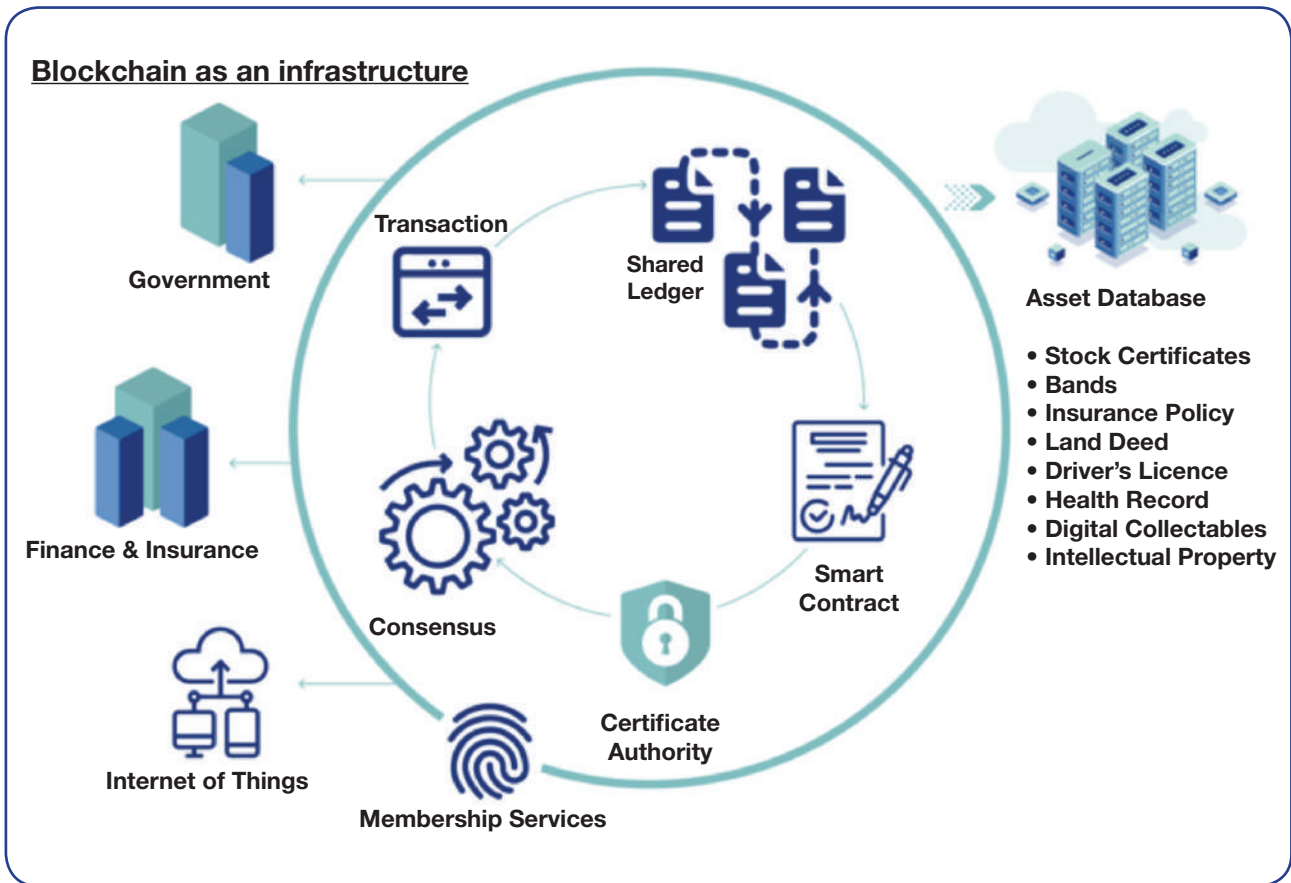
DO 6: Digital services to connect business and to facilitate cross border trade

Before the pandemic, ASEAN members had already acknowledged the value of digitalisation and the significant role digital infrastructure plays in enabling any large-scale digital transformation efforts. The myriad of digital blueprints being launched in recent years, e.g.

- (i) Thailand's Digital Economy and Society Development Plan;



ACASIA is a collaboration of 7 telecommunication giants across ASEAN.



Private blockchain is permissible using ACASIA's platform

- (ii) Indonesia's 2025 Payment System Blueprint, and;
- (iii) Malaysia's MyDIGITAL Blueprint,

all places emphasis on the digital infrastructure as the core competency in driving most digital initiatives forward.

DIGITAL INFRASTRUCTURE FOR DHPS: A COLLABORATIVE EFFORT

The World Economic Forum projected ASEAN's digital economy to grow significantly over the next ten years, adding an estimated US\$1 trillion to regional GDP. A unified regional digital infrastructure will allow ASEAN nations to leverage faster on the digital economy and shed its "developing region" status.

THE DHP MAY BE THE CATALYST TO ALL THIS

A project of this scale ultimately relies on the collaboration between investors, vendors, and government stakeholders. Cooperation from the government, specifically from the Ministry of Science, Technology, and Innovation (MOSTI), Ministry of Health (MOH), Ministry of Foreign Affairs (MOFA), and the Immigration Department, along with the respective counterparts from each ASEAN member state is crucial.

The latest Malaysian health passport, *Immunitie*, operates on a public blockchain and partners with the Qualitas Medical Group of clinics and laboratories in Malaysia and across ASEAN. It utilises the Affinidi universal verification system and focuses on overseeing a smooth travel experience between Johor Bahru and Singapore residents, although it plans to expand its services globally. In an article published by BERNAMA on the subject on 15th April 2021, CEO of *Immunitie* Datuk Dr. Nik Boden also stresses the importance of the security of confidential data. The bottom line: no DHP system will succeed if the privacy and security of personal data are not guaranteed. It is common knowledge that public blockchains lack privacy and user anonymity. It is also trustless, decentralised, and responds slower due to the unlimited number of users. What better way to achieve high-level security, low latency, and centralised storage other than a single dedicated regional platform operating on a private blockchain?

ASEAN must work together to face the challenges brought on by the pandemic. Speed, meticulous planning, regional cooperation are keys to the rapid implementation of the DHP on an international scale. Once achieved, the outcome will be tremendously beneficial: such an infrastructure will serve as the pioneer and prototype for future region-wide initiatives and assist in propelling local businesses beyond ASEAN. [my](#)



WHERE THE PANDEMIC MEETS THE INFODEMIC

MANAGING COVID-19 INFODEMIC IN MALAYSIA

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The Covid-19 pandemic has brought about a nervousness, anxiety, and concern among the public. Much uncertainty has surrounded the Covid-19 coronavirus since it was first discovered in December 2019. From then until now, the public craves information that would help them to be safe and healthy.

What is regrettable however, is that the pandemic has created a situation where there is an overabundance of information – some accurate and some not. The World Health Organisation (“WHO”) has termed the overabundance of information as “infodemic”¹, a reference to the epidemic of misinformation, with effects that can be worse than the illness itself.

With the internet, the infodemic is now propagated through social media platforms and other channels, and, in the context of the COVID-19 pandemic, it is intensified

by the global scale of the emergency. While the infodemic also affect other countries, there are nuanced issues and challenges in managing the infodemic in Malaysia.

EXISTING INITIATIVES

Strategic communication & Fact-checking

During epidemics, more so than in normal times, people need accurate information to adapt their behaviour to protect themselves and their families and communities against infections.

Therefore, interventions and messages must be judiciously crafted based on science and evidence. There are two main overarching challenges in this matter: the need to manage the creation and dissemination of trusted information so that it is not excessive, overwhelming, or confusing; and the need to counter misinformation.

¹ <https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200202-sitrep-13-ncov-v3.pdf>

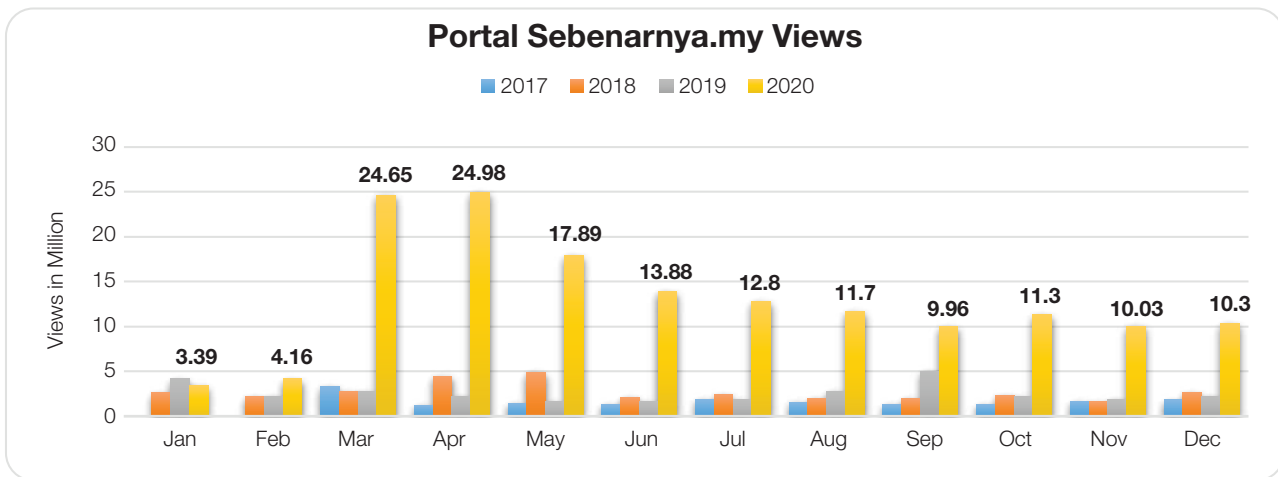


Figure 1: Page views of Sebenarnya.my portal (Source: MCMC)

In Malaysia, the Ministry of Health (“MOH”) and the National Security Council (“NSC”) are using the MySejahtera application as a centralised application to distribute updated information related to COVID-19 in real-time. They are also using their respective verified Telegram channels to distribute official messages and information to the public.

In the fight against Covid-19 misinformation, the Sebenarnya.my portal plays the important role of a trustworthy and fact-checking service to vet through unverified information. The portal has a specific COVID-19 tab that contains more than 490 fact-checks of COVID-19 related false information, which peaked in March 2020.

Inter-agency coordination

As part of the response to the infodemic, a Rapid Response Team was established within the Ministry of Communications and Multimedia (KKMM), with active participation from the various Ministries or Government agencies that will issue public statements explaining, clarifying, or refuting any false or misleading news. This will then be fed into the Sebenarnya.my portal.

Collaboration and cooperation from foreign platform providers

Foreign platform providers also played an important role in weeding out misinformation and unverified rumours about Covid-19 on their platforms. 13 million pieces of COVID-19 misinformation were removed by Facebook between March and Oct 2020. Twitter removed more than 22,400 tweets for violating its policies against COVID-19 misinformation since the beginning of the pandemic.

ISSUES AND CHALLENGES

Despite the abovementioned initiatives, the challenge to manage the Covid-19 infodemic in Malaysia remains. The following are the issues and challenges faced by the government, the social media platform providers, as well as the affected parties, especially the consumers.

Misinformation vs Disinformation

There is a distinct difference between the two:

Misinformation is a broader classification of false or inaccurate claims shared largely unwittingly and without the intention to deceive. Disinformation is a specific subset of misinformation created with deliberate intentions to deceive. Both have caused significant and real harm throughout the COVID-19 pandemic.

Misinformation, for instance, happened in the early days of the pandemic, when people were scared and craving information that would allow them to stay safe and healthy. As a result of their panic, all information received was just accepted as is and was forwarded to friends and families with the aim of asking people to be careful, without any ill-intention to deceive.

However, as we now know, both misinformation and disinformation are difficult to fight once they are out in the digital wild. The pace at which unverified and often false information travels make any attempts to catch up with, retrieve, and correct it an ambitious endeavour. Viral information tends to stay in circulation longer because repeated misinformation is more likely to be judged as true, and people often continue to believe falsehoods even after they have been debunked.

While misinformation may not violate any laws nor breach the platform providers’ rules or standards, it could still cause harm in some communities, where the information bounces around in an echo chamber.

Low awareness (sharing hearsay)

People tend to love being the first to share a piece of information. Unfortunately, many will not care if the news is factually true and will distribute it to other people without proper checks and verification.

Most of the false news-mongers would typically disguise themselves under certain phrases such as “hearsay”, “I heard such and such”, or “seeking clarification”. However, when wrong information is conveyed from one to another and repeated many times over, such unverified information turns into something factual and become actual news, which would then be a challenge to manage.

Social stigma

In distributing messages to the public, on the one hand, it is best to provide transparent, real-time and updated information to the public. However, on the other hand, providing information in a highly transparent manner could also have some negative impact in a high-context culture. That is the reason all actions need to be nuanced within the context of the communities that we are living in.

For instance, providing information publicly on a website of names or details of people infected and places where COVID-19 infection took place may not be effective as others think it may. It may also lead to people and places being stigmatised or labelled, which may lead to the unsuspecting individual's privacy being violated and shops losing customers.

Opinion loophole makes fact-checking even harder

Opinion includes content that advocates certain fixed ideas and draws conclusions based on the interpretation of facts and data and tells the public what the author or contributor thinks about an event or issue. For example, it is difficult to draw the line on social media postings that contain people's personal experiences with vaccines. However, they may result in vaccine hesitancy (delay in taking or refusing to take vaccines) among readers of such postings.

Opinion content is generally excluded from false information because we do not interfere with individual expression or debate. However, the definition of "opinion" is not meant to give a free pass to spread false information, solely based on how it is presented.

Enforcement gap

As of 21 March 2021, a total of 293 investigation papers have been opened by PDRM and MCMC regarding false news related to Covid-19. A total of 119 cases are still under investigation, while 51 cases have been prosecuted in court, 30 have been found guilty, 20 are in the process of trial, and 12 have been given warning notices.

The Movement Control Order (MCO), which was enforced since mid-March 2020 to curb the spread of COVID-19 has significantly increased the use of the internet for both social and business communications. This has presented a challenge in terms of enforcement despite the various awareness campaigns that the MCMC has launched to remind the public about the Covid-19 infodemic.

TRANSFORMING CHALLENGES TO OPPORTUNITIES

Deterrence

While cultivating new norms in managing information overload with self-regulation through the "Click Wisely"

advocacy and awareness programs, fact-checking empowerment through the Sebenarnya.my Portal, and the enforcement of existing laws, the government has also stepped up its efforts through the introduction of the Emergency (Essential Powers) (No. 2) Ordinance 2021, which aims to increase the effectiveness of enforcement in curbing the spread of false news related to COVID-19 and declaration of emergency. This effort is to re-emphasise the seriousness of spreading false information which can affect the national security and harmony.


CONCLUSION

Information overload can impact citizens in every country and addressing them is a new and important challenge in the response to disease outbreaks. As offbeat as it sounds, the current COVID-19 infodemic is an opportunity to find and adopt new preparedness and response tools. Tackling this will not be a straightforward business as it is linked to people's beliefs and behaviour. A multi-pronged approach will be needed to holistically manage the issue.

While trying to level the COVID-19 pandemic curve by following physical distancing orders, we cannot allow the infodemic to rise and spread. The fear is that it will become a cancer in our society. An unhealthy culture could develop and eventually be accepted as a norm in society. We do not want this to happen in Malaysian society, which is known for its gentle and polite attitude.

We should also try to level the infodemic curve and one of the ways is to be more selective and sensitive when communicating on social media. We can choose to stop following individuals or groups who are fond of sharing unauthentic information or frequently uploading negatively mingled content.

While various advocacy and awareness programs will continue, the users' responsibilities as digital citizens require more than just being informed. They must also be vigilant in verifying information before posting it on social media. Being able to use their discretion in evaluating the accuracy, perspective, and validity of digital media and social posts is one of the competencies that one should have to become a force for good. Furthermore, users must have the right moral values of creating appropriate and correct content.

Everyone has a responsibility to combat the scourge of fake news and disinformation. This ranges from the promotion of strong norms in professional journalism, supporting investigative journalism, and improving digital literacy among the general public. Taken together, these steps would promote quality discourse and weaken the environment that has propelled misinformation and disinformation around the globe. 



ENFORCEMENT ACTIVITIES UNDER THE PANDEMIC

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Enforcement activities are included in the many functions that MCMC carries out when regulating the converged telecommunications industry in Malaysia. MCMC is charged with ensuring that all enforcement activities have been implemented effectively and efficiently in accordance with the provisions of the Communications and Multimedia Act 1998 (CMA '98), the Digital Signature Act 1997 (DSA '97), the Postal Services Act 2012 (PSA 2012) and the Strategic Trade Act 2010 (STA 2010) and its ancillary laws.

The Enforcement Division (ED) of MCMC conducts thorough investigations of all complaints to ascertain if there were any offences committed within the four facets of regulation under CMA '98, namely economic regulation, technical regulation, consumer protection and social regulation. Section 68 of the CMA '98 empowers the MCMC to undertake an investigation on any matter pertaining to the administration of the Act or its subsidiary legislation. The investigation process conducted by ED is illustrated in Figure 1.

The First Information Report (FIR) is the receipt of a complaint in the form of a written document containing information related to the commission of an offence under the communications and multimedia laws. The offence is then classified under the appropriate legal provision under the relevant Act. An Investigation Officer

(IO) is then appointed, and an Investigation Paper (IP) opened. Information is gathered from the complainant, witness(es), suspect(s) and person(s) relevant to the case. This may be done through online platforms or field surveillance.

Evidence relevant to the case is seized from the suspect through a search warrant or assistance from the police. MCMC enforcement teams follow set procedures. An Authorised Officer (AO) of MCMC is appointed in writing by the Minister (section 245 (1) of CMA 98). The AO may apply for a search warrant from the magistrate if he has reasonable cause to believe that offence is being or has been committed on any premises, or that any evidence or thing which is necessary to the conduct of an investigation into an offence may be found in any premises. Upon obtaining the search warrant, the authorised officer may enter the premises to search for and seize any such evidence or thing (section 247 of CMA '98). The AO may also apply for assistance from police officers not below the rank of Inspector to enter the premises and exercise all the powers referred to in section 247 CMA 98 if he has reasonable cause to believe that the investigation would be adversely affected, or evidence of the commission of an offence is likely to be tampered with, removed, damaged or destroyed, by reason of delay in obtaining a search warrant under that section (section 248 CMA '98). The field activities are important in identifying and tracking down



Figure 1: Investigation process

the suspect in turn seizing the crucial evidence relevant to the case under investigation. The seized evidence will be tagged as exhibits and sent to expert(s) for analysis.

The IP, when finalised, contains all information, evidence and analysis of the case. It is then submitted to the Deputy Public Prosecutor (DPP) for deliberation and a decision on whether to proceed with prosecution. After reviewing the IP and considering the evidence gathered, the DPP may instruct to proceed with prosecution, offer a compound, issue a warning or to take no further action (NFA) on the case.

PDRM-MCMC COVID-19 TASKFORCE

To support the government's efforts in combatting the dissemination of fake news through internet and social media platforms, Polis Di Raja Malaysia (PDRM) and MCMC established the PDRM-MCMC Covid-19 Taskforce in January 2020. Its mission is to deliver successful prosecutions of Covid-19 fake news cases through rapid coordinated efforts and resource sharing. The taskforce thus far has initiated 293 investigation papers with 51 offenders charged in court and 12 individuals served with warning letters.

ENFORCEMENT ACTIVITIES DURING THE PANDEMIC

Enforcement activities are pretty much restricted during this pandemic due to the implementation of the movement control order and additional guidelines from the government and MCMC management to prevent further transmission of the virus. As field activities involve a high amount of risk to the authorised officer, organisation and the public, ED had to come up with a balanced approach for this unprecedented event, based on the movement control orders, as follows:

- **Movement Control Order (MCO):** In this category, ED to proceed with the investigation and

field activities for cases classified as High Profile (Covid-19 Fake News and 3R - Race, Royalty, Religion). Other cases will be postponed.

- **Conditional Movement Control Order (CMCO) & Recovery Movement Control Order (RMCO):** ED to proceed with the investigation and field activities for the cases classified as High Profile and with other cases in green and yellow zones.
- **Enhanced Movement Control Order (EMCO), Targeted Enhanced Movement Control Order (TEMCO), Administrative Enhanced Movement Control Order (AEMCO):** ED to postpone the investigation and field activities for this type of movement order due to high risk and limited access.

The AO must dynamically adapt and embrace the new norms to ensure that critical enforcement activities are not interrupted during the MCO period. Systematic safety precautions are practiced throughout the field surveillance activities and raiding operations to prevent the operation personnel from contracting the virus.

A crucial decision taken by ED was to minimise the number of AO in the raiding team without jeopardising the overall operation. Apart from that, additional personal protective equipment were prepared for the raiding team. Also, all personnel's health conditions were observed before conducting any fieldwork activities.

The raiding team had to execute multiple roles and functions to keep the number of personnel to a minimum without jeopardising the whole operation. The process of gathering digital evidence by the digital forensic department was done remotely with the assistance from the officers at the site. Where necessary, team members had to take swab tests after the raid to ensure that they had not been infected.

The raiding team will continue to self-monitor their health for at least 3 days after a field operation. They will be advised to work from home. If any of the personnel

COVID-19 CASES INVESTIGATED			
	PDRM	MCMC	Total
Investigation Paper (IP)	237	56	293
• Active	109	10	119
• Charged in court	45	6	51
• Warning letter / notice	-	12	12
• No further action (NFA)	83	28	111

Table 1: Investigation status on Covid-19 fake news as of 20 April 2021 (Source: MCMC & PDRM)

COVID-19 CASES CHARGE IN COURT			
	PDRM	MCMC	Total
Charged in Court	45	6	51
• Guilty	25	5	30
• Not Guilty	0	1	1
• On trial	20	0	20

Table 2: Prosecution status on Covid-19 fake news as of 20 April 2021 (Source: MCMC & PDRM)

are tested positive for Covid-19, they will isolate and quarantine themselves in the quickest way possible and inform the Crisis Management Team (CMT) of MCMC. ED will also adhere to CMT instructions and advice on maximum office attendance and workplace controls to reduce transmission among employees and team members. Enforcement team members are well aware of the need to adhere to SOPs.

ENFORCEMENT STATISTICS

Throughout 2020, ED executed 111 raiding operations and 232 surveillance activities (Figure 4). Almost 50% of raiding operations were conducted in Selangor, followed by Pahang and Perak (Figure 5). More than 50% of the activities were conducted during the RMC0 period (Jun-Dec) where the Covid-19 situation was more relaxed and 30% of the activities were conducted in August 2020.

COLLABORATION WITH OTHER LAW ENFORCEMENT AGENCIES

Despite the MCO, the collaboration and joint operations with other Law Enforcement Agencies (LEAs) are ongoing, especially those which require MCMC's assistance and technical expertise. Among the agencies the ED collaborated with during this pandemic are Jabatan Imigresen Malaysia (JIM), Suruhanjaya Tenaga (ST), Bank Negara Malaysia (BNM), Polis Di Raja Malaysia (PDRM), Kementerian Perdagangan dan Hal Ehwal Pengguna (KPDNHEP), Lembaga Hasil Dalam Negeri (LHDN), local authorities, and Tenaga Nasional Berhad (TNB).

The operations joined by ED MCMC are:

- **OPS Back for Good (B4G)** – Led by JIM, with other agencies, focusing on illegal immigrants and online gambling offences.
- **OPS Spider** – Led by PDRM, with KPDNHEP involvement to curb the fraudulent use and sales

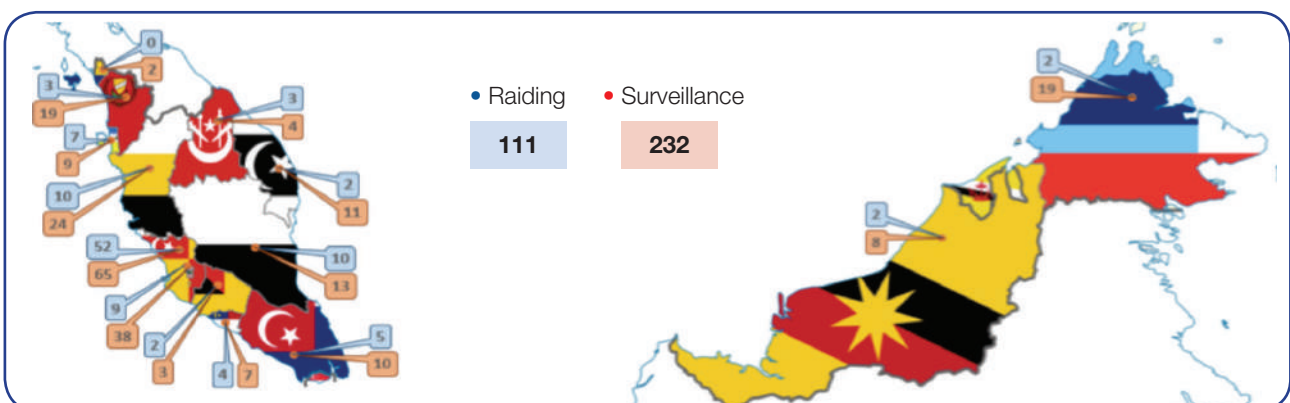


Figure 2: Raiding and Surveillance Activities, 2020 (Source: MCMC)

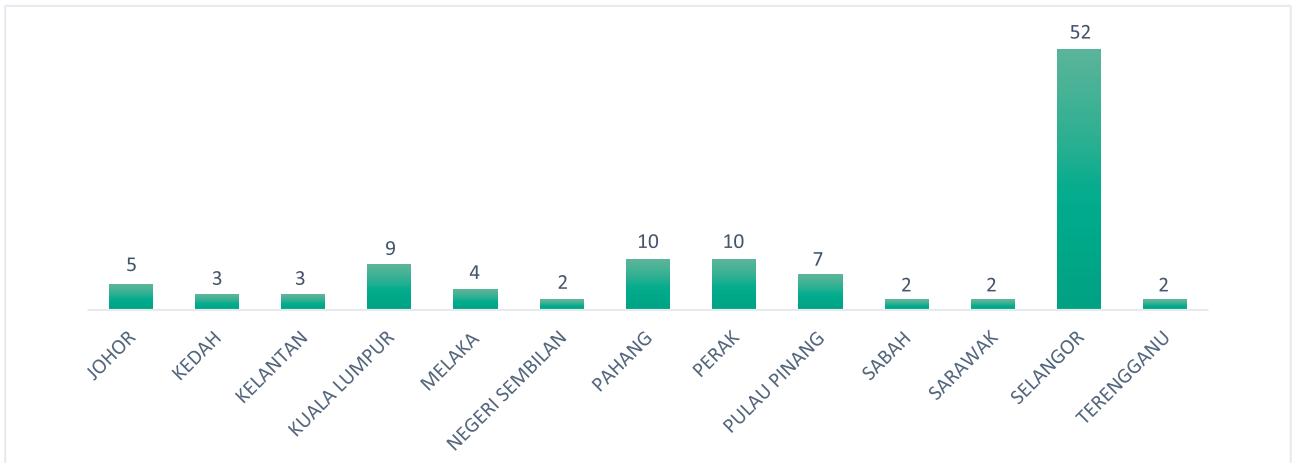


Figure 3: Raiding Operation in 2020 by States (Source: MCMC)

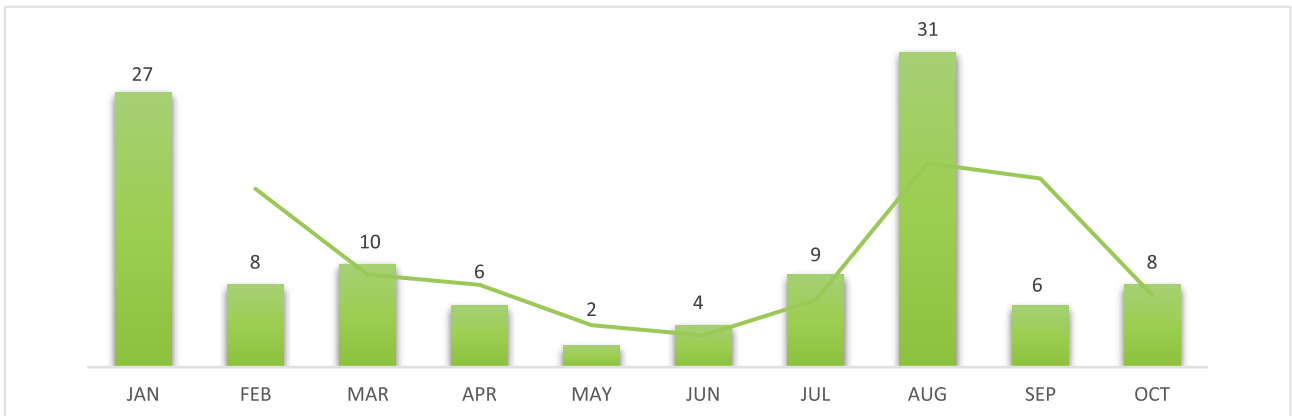


Figure 4: Raiding Operation in 2020 by months (Source: MCMC)

of illicit streaming devices (ISD).

- **OPS Pelican** – Led by PDRM and joined by telcos to combat telecommunication fraud online.
- **OPS Bitcoin** – Led by ST, with involvement of PDRM, TNB and local authorities to curb the fraudulent use of electricity for bitcoins mining activities.

workload that, in the long run, can result in fatigue and have an impact on health.

Public concern is another challenge. Members of the public encountered during the search might become anxious and uneasy as they are fearful that they might contract Covid-19 from the team. Conversely, the risk of contracting Covid-19 from civilians is high.

CHALLENGES

There are challenges to be embraced when enforcing the law in the pandemic. The main challenge is to ensure that raids are executed smoothly with a reduced number of field personnel. Less personnel also leads to additional

In addition, interstate travel during the MCO phase required different processes. Interstate travel permits had to be obtained and, as a result, in some instances there were some delays.



Raiding team conducting a search in the premise



Raiding team checking the suspect's devices and peripherals



Raiding team conducting a search with assistance from PDRM



Raiding team conducting a search on the suspect with assistance from PDRM



Integrated OPS with other LEAs – OPS Bitcoin



Integrated OPS with other LEAs – OPS Bitcoin

CONCLUSION

Regardless of the challenges, ED manage to fulfil 232 surveillance and 111 raiding operations within the prescribed timeline. Additionally, ED also collaborated with other LEAs. This achievement is due to the dedication and teamwork of each team member and strong leadership support. On a related note, it is everyone's shared responsibility to follow all the SOPs that have been announced so that COVID-19 virus infections can be diminished, and the curve flattened. [.my](https://www.mca.gov.my)



NATIONAL POSTAL AND COURIER INDUSTRY LABORATORY

RESPONDING TO THE NATION'S
FUTURE FULFILMENT DEMAND

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The rapid growth in the e-Commerce services sector has shown that the digital economy will be one of the drivers of the world economy. It will impact Malaysia's economic growth. Accordingly, the country's postal and courier industries have important roles in supporting this new growth. The country's postal & courier industry must take the necessary steps to ensure that they can provide world/first-class services to the people from the perspective of service quality, access and coverage.

The Ministry of Communications and Multimedia through the Malaysian Communications and Multimedia Commission (MCMC) as the national postal and courier service industry regulatory body has the role of formulating strategic plans to improve and empower the industry to face various current and future possibilities and challenges in line with technological changes, trends, emerging markets as well as new consumer trends.

To pave the way for the postal and courier service industry transformation plan, the Ministry of Communications and Multimedia has set a moratorium period of two (2) years effective from 14 September 2020 to 15 September 2022 during which the government will review the postal and courier service licensing framework to ensure the postal and courier service industry remains competitive, inclusive and relevant to current global developments. The moratorium is intended to enable industry players to redesign their business models in a sustainable manner while ensuring customer satisfaction for the services offered. Applications for new licences and renewal of licences are temporarily disrupted during this period to enable the government to review the relevant laws and regulations in line with the rapid advancement of technology, especially in the era of digitalisation.

Findings from the latest industry performance review conducted by the Ministry of Communications and

Multimedia through MCMC also found that delivery services need to improve their Quality of Services (QoS) through the application of accurate real-time delivery data systems. This is especially important as the nation faces the challenging situation of addressing the new norms as well as meeting the rising demands of the economic and consumer expectations. The demand for delivery services clearly became more pronounced during the implementation of the Movement Control Order (PKP) during the COVID-19 pandemic. There was a sharp increase in the delivery of essential goods via courier services.

The rapid growth of the digital economy has stimulated the development of the global economy which has a direct impact on Malaysia and its strategic partners at the ASEAN and global levels. There are significant industry growth and projections which indicate that it will continue to grow in the future. The courier service industry with its projected compounded annual growth rate (CAGR) of six (6) percent until 2025 will play an important role in supporting the growth of the e-Commerce sector which is projected to expand at a rate of twenty four (24) percent in five (5) to ten (10) years to come.

NATIONAL POST AND COURIER TRANSFORMATION

The Ministry of Communications and Multimedia through MCMC had organised the National Postal and Courier Industry Laboratory (NPCIL) involving a total of 108 participants comprising industry players and relevant stakeholders over a period of eight (8) weeks from 12 October to 4 December 2020. The objectives were the formulation of an action plan and the development of a framework for the strategic transformation of the country's postal and courier service industry.

The NPCIL aims to improve industry performance through the 4R Strategy, namely:

- a) Reliability;
- b) Reachability of services;
- c) Relevancy though aligning the services with the growth of the industry in the digital economy; and
- d) Resiliency.

Its focus was on ensuring that the postal and courier service industry can take the necessary steps towards offering world class/first class services to the people from the perspective of quality, access and service coverage. The fact is that consumer satisfaction is core to the sustainability of the industry.

The NPCIL came up with strategic national aspirations in terms of increasing the performance and capacity of the postal and courier industry in line with its 'True North' which is **"Delivering Quality of Service and Seamless**

Coverage to all Malaysians sustainably to support the projected e-Commerce Industry growth from 14 parcels per capita to 30 parcels per capita by 2025".

NATIONAL POST AND COURIER INDUSTRY LABORATORY

The NPCIL had engaged the postal and courier service providers in addition to several relevant Ministries and government agencies. More than 20 stakeholders from the public and private sectors were interviewed to obtain feedback on issues, challenges and constraints related to the postal and courier service sectors. Meanwhile, the entire activities of the NPCIL spanned across more than 100 stakeholders representing more than 30 organisations and companies from the public and private sectors.

During the course of the laboratory, industry participants worked closely with the government to formulate improvement initiatives from the perspective of licensing, quality, access and coverage of postal and courier services, as well as planning investments in high potential areas to enable more people to benefit from the availability of comprehensive and quality delivery services.

NPCIL was implemented to obtain comments, views and inputs from the industry pertaining to operating costs of delivery of goods, tariffs, increase in the number of licenses, level of competition, service digitalisation initiatives, last mile delivery and penetration into rural and inland areas.

Its main objectives include the following:

- a) Coordinate the scope of project objectives with administrators and other stakeholders at the Federal Government, State and Local Government levels;
- b) Obtain commitment from the top management of postal and courier service providers as well as industry movers;
- c) Implement a syndication process involving all stakeholders and relevant parties;
- d) Assess the funding required for the implementation of the NPCIL's recommended initiatives; and
- e) Obtain agreement and commitment on the Final Report of the NPCIL which incorporates the recommended initiatives and implementation plans between the project owners and other binding parties.

The findings from the Final Report will be utilised to formulate the strategic roadmap for the national postal and courier service industry known as the National Courier Accelerator Plan (PAKEJ) (Figure 1) aimed at delivering the following:

- a) Improved and flexible access and coverage of postal and courier services for the consumers and

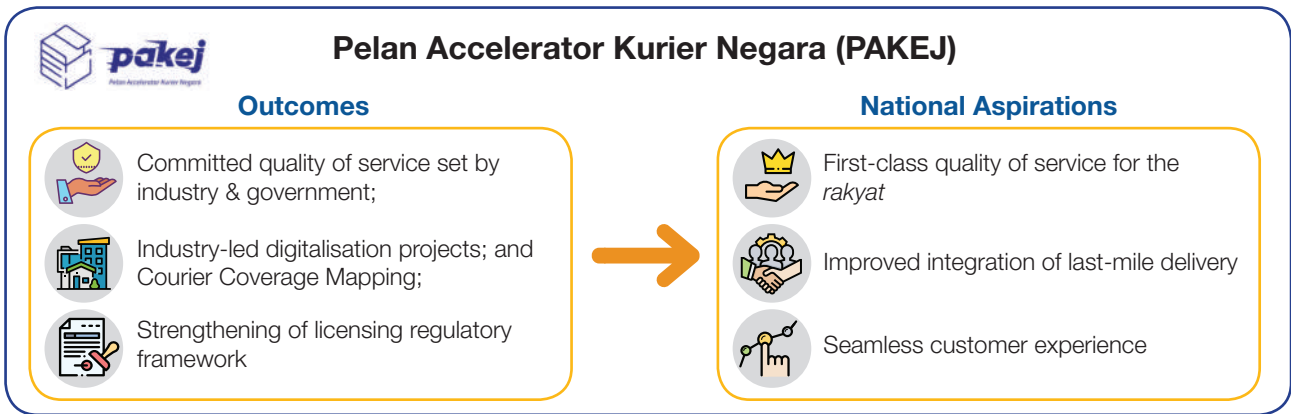


Figure 1: NPCIL's ambitious aspirations

- merchant communities through the integration of end-to-end delivery systems up to the last mile delivery points; and
- b) Improved courier services through the setting of industry benchmarks and guidelines on Quality of Service (QoS) that ensure consumers and business communities would receive world/first class services.

Following the findings from NPCIL, eight (8) initiatives have been identified in line with the key outcomes areas (or Pillars) as shown in Figure 2.

SUMMARY OF THE STRATEGIC INITIATIVES UNDER PAKEJ

PAKEJ-Initiative 1: Parcel Point Network (PPN)

The Parcel Point Network (Figure 3, next page) is one of the key initiatives that provides greater flexibility and accessibility to consumers. It is a collaboration between e-Commerce players or the marketplaces, couriers and parcel locker providers to provide an inter-operable platform available for use by all courier service players to improve the adoption of Pick-up Drop-off (PUDO) points.

A PUDO point is a location, often a local shop or retail outlet, that offers a parcel pick-up and drop-off service as part of a wider network of PUDO points. It allows parcels to be picked-up or dropped-off at locations where a trusted member of a PUDO network receives them.

PAKEJ-Initiative 2: Asset Sharing and Collaboration with Posmen Komuniti

In rural areas [especially in Sabah and Sarawak], the postal service coverage is low compared to urban areas. For example, an industry player shared coverage in West Malaysia is >80%, however it is only around 66% in East Malaysia. The low coverage is due to the inadequate infrastructure in East Malaysia such as internet connectivity as well as physical infrastructure [i.e. access roads, energy, etc.], which requires heavy investments.

As such, cost of delivery to East Malaysia is high, with many relying on delivery agents to deliver parcels. Pos Malaysia (POSM) currently operates the Posmen Komuniti (PK) Programme, with 600 riders servicing rural communities in Sabah & Sarawak. An option for delivery asset sharing and collaboration initiative between POSM and courier service companies under the Program Perantis Posmen Komuniti (3PK) will help lower cost of delivery and expansion of network coverage to East Malaysia. In

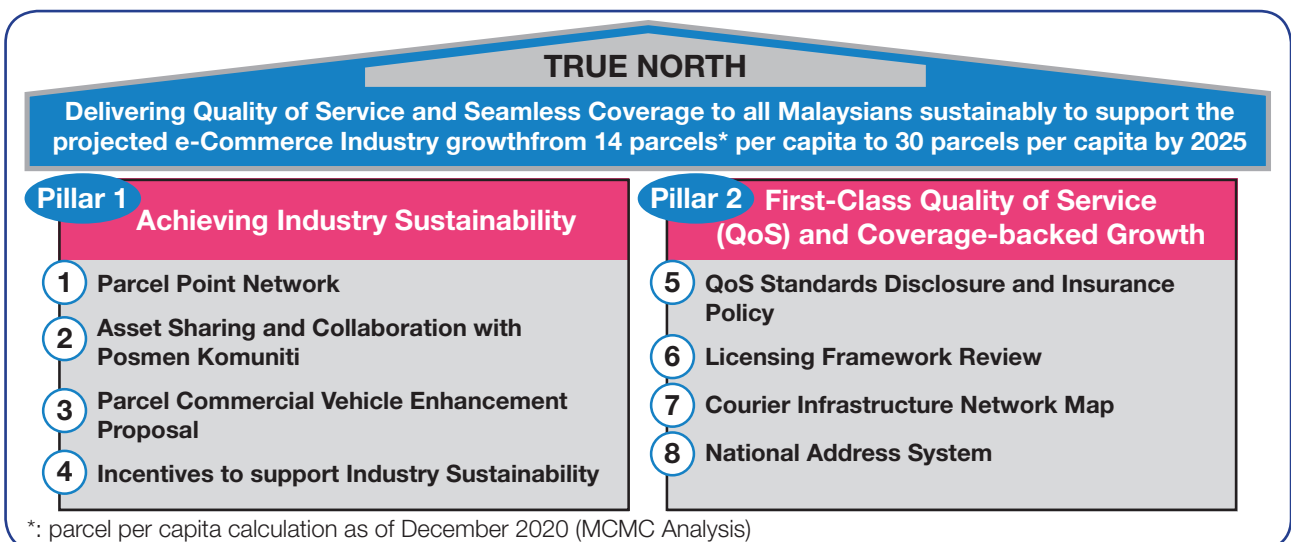


Figure 2: Eight (8) initiatives under PAKEJ

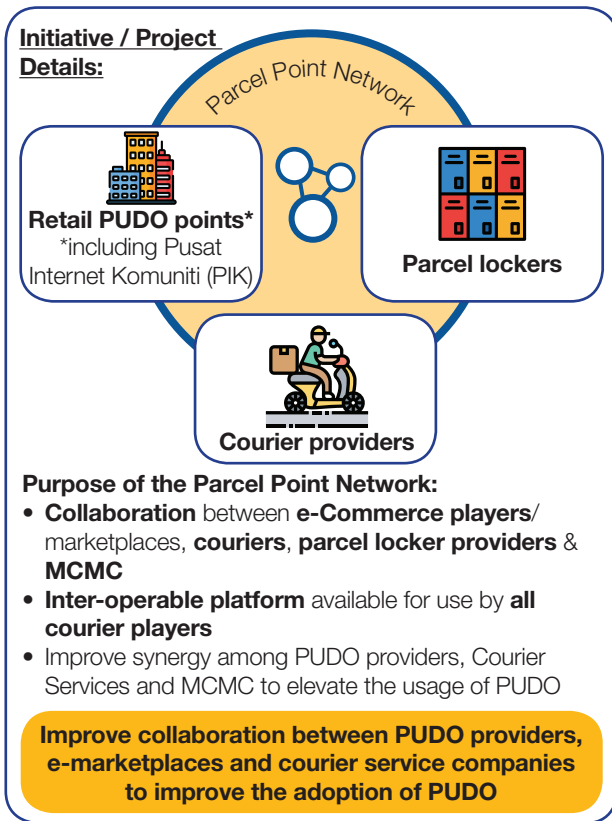


Figure 3: Parcel Point Network (PPN)

In addition to this, the initiative will improve the utilisation of PKs as well as providing additional income to the riders to compensate for the declining mail volumes. In addition, value-added features embedded into 3PK scheme could improve the livelihood of PKs such as mobile reload/bill payment (Figure 4).

PAKEJ-Initiative 3: Postal Commercial Vehicle (PCV) Enhancement Proposal

Courier service companies around the world have been looking into alternative modes of transportation in courier delivery to boost delivery and lower costs. Commercial delivery vehicles are essential assets in the operations of the courier service industry. However, existing commercial vehicle regulations may restrict the potential growth of the courier service industry, particularly for specialised

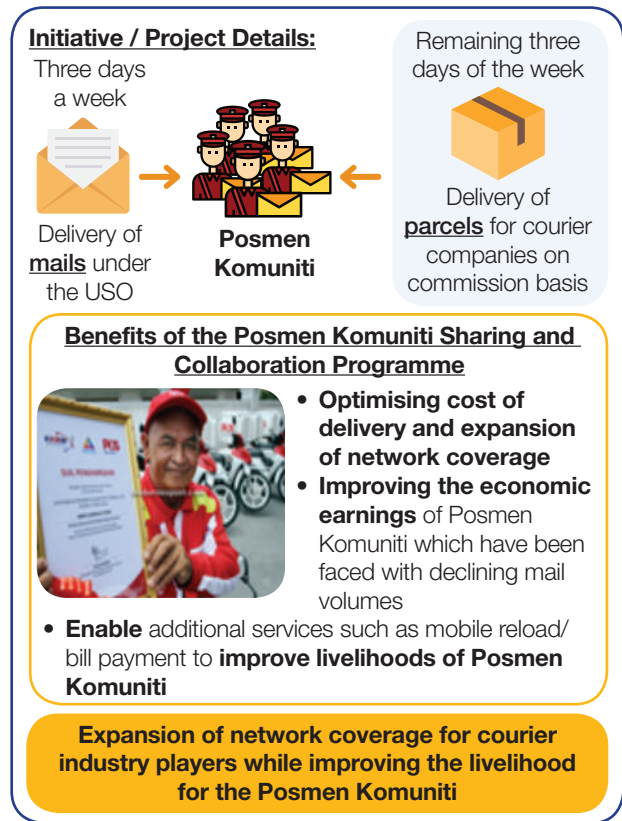


Figure 4: Collaboration with Posmen Komuniti (PK)

vehicles that may fulfil niche requirements. Alternative mode of transportation such as three-wheelers (3W) in other countries increases productivity and delivery capacity for courier drivers. Logistics providers in China and Germany have been using 3Ws in urban delivery to increase delivery efficiency.

The Association for Malaysian Express Carriers (AMEC) comprising courier service licensees has been tasked to conduct an assessment to justify the cost benefit of introducing an alternative mode of commercial transportation to the courier service industry should the industry decide to pursue it. AMEC shall submit collective proposal on behalf of the industry to seek consideration from MOT and JPJ to allow 3Ws to be utilised for commercial purposes in Malaysia (Figure 5).

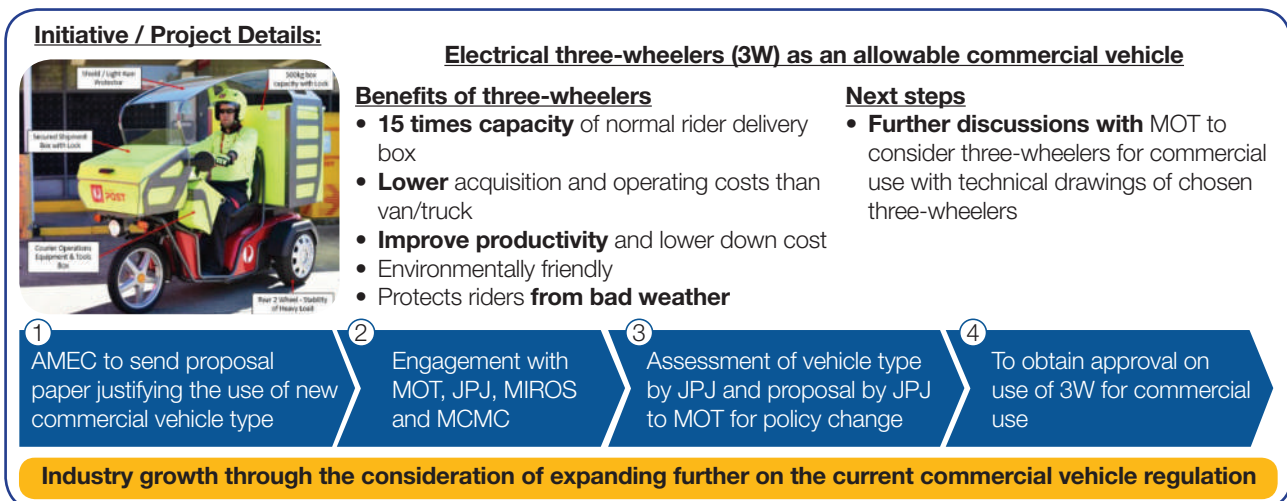


Figure 5: Postal Commercial Vehicle (PCV) Enhancement Proposal

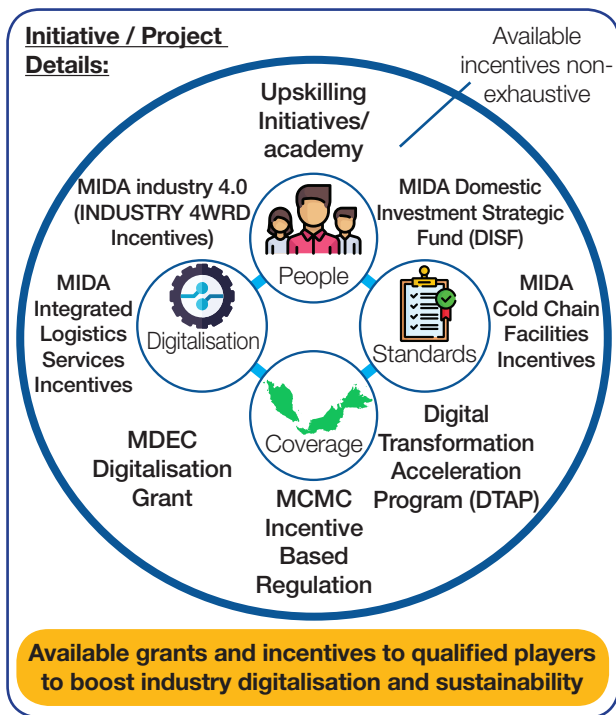


Figure 6: Incentives to support industry sustainability

PAKEJ-Initiative 4: Incentives to support industry sustainability

Digitalisation is one of the key enablers in transforming the courier service industry through operational efficiency and cost saving measures. The courier service players have yet to fully embrace digitalisation despite many incentives made available by the government in order to improve productivity and service to end consumers mainly due to high investment expenses. Thus some form of incentives/grants from the Government in this area would be necessary to ensure that the underserved in Malaysia get to enjoy courier service and access to e-Commerce.

However, some information on the available incentives do not reach the industry sufficiently despite past efforts, resulting in low utilisation of incentives among courier service players, in particular the local players [e.g. digital improvement, network coverage expansion, cold-chain logistics, etc.]. Such limitations has hindered the courier service industry from pursuing a collective vision on where the industry is heading. It is imperative to stimulate concerted efforts within the industry to promote the adoption of digital services, which can come via public-private sector collaboration to ensure sustainability (Figure 6).

PAKEJ-Initiative 5: Quality of Service (QoS) Standards Disclosure and Insurance Policy

Consumer service satisfaction is determined by the level of complaints on the ground, which shapes the perception on Quality of Service (QoS). Majority of the courier service industry players currently only publishes rates for delivery by localities, however the consumer does not have an overview on delivery schedules [unlike commercial

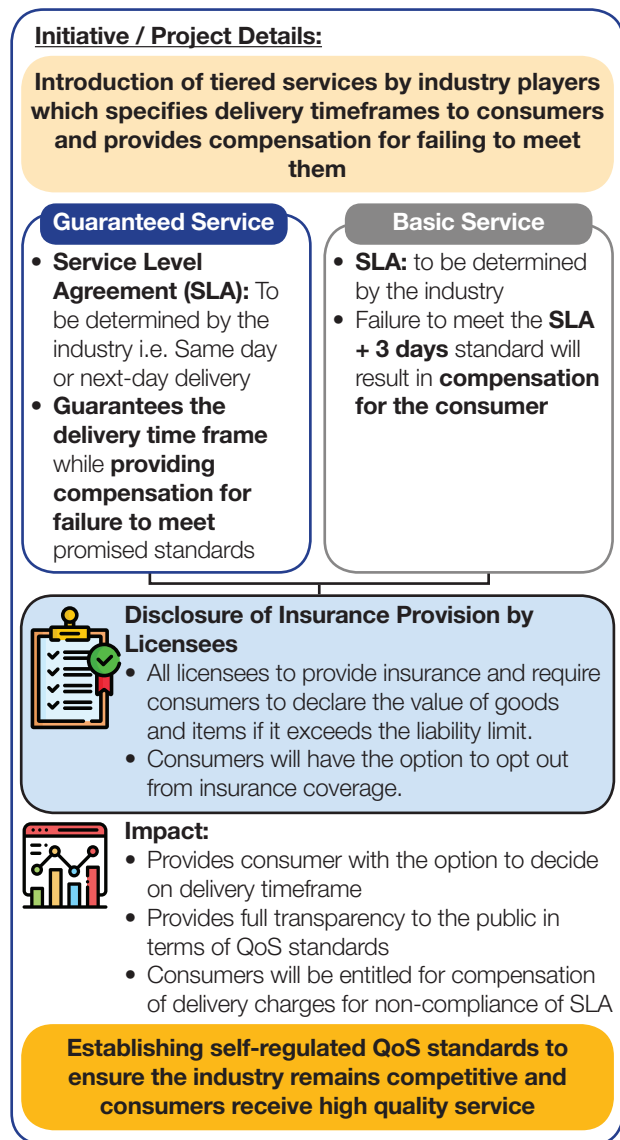


Figure 7: Quality of Service (QoS) Standards Disclosure and Insurance

clients such as e-Commerce players who do publish a delivery date because they have pre-agreed Service Level Agreement (SLA) with the courier service providers]. A lack of SLA makes it difficult for consumers to claim compensation as there is no commitment to delivery times unlike international players such as DHL.

QoS and coverage improvements are further hampered by a lack of linkage between categories of complaints and locations contained within the complaint's database system. In reality, technological savvy customers are demanding better and faster delivery services, with increased control over their delivery experience and expectations. Technological enhancements can streamline core businesses and increase QoS through strategic partnerships between courier service providers and acquired customers. Further, a more transparent approach from the industry will provide a consumers better overview on QoS hence constitutes a touchpoint to the Rakyat (Figure 7).

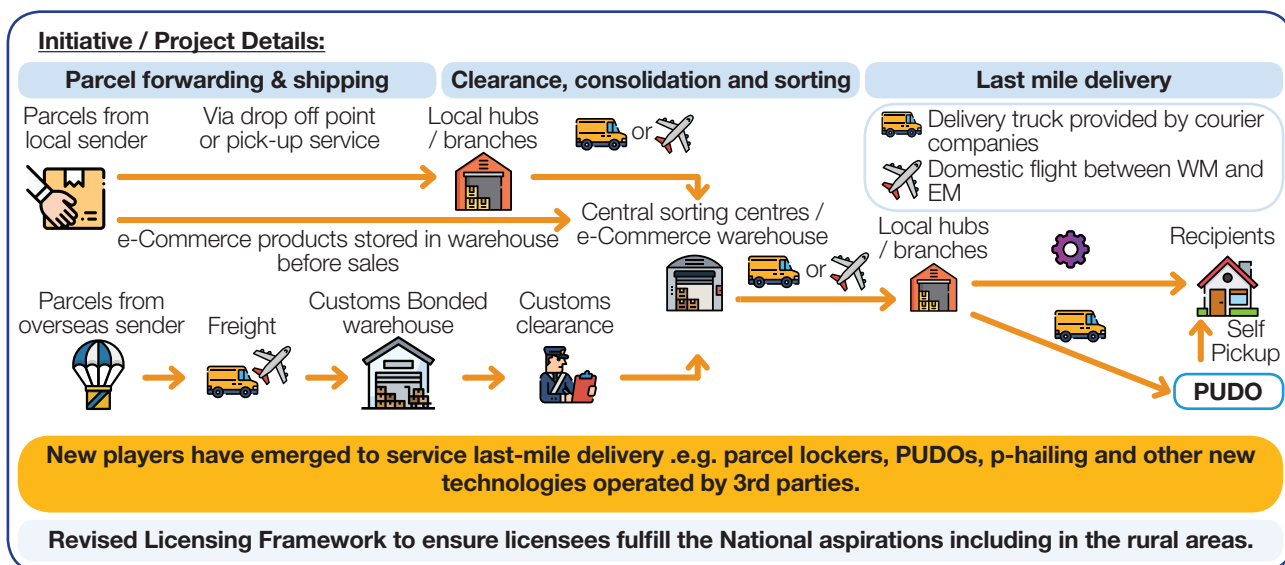


Figure 8: Licensing Framework Review

PAKEJ-Initiative 6: Licensing Framework Review

The rationale for reviewing the current licensing framework is the urgency for Malaysia to address the ‘new norm’ and to cater for future demand driven by situational changes, development and evolution of the industry at regional and global level. The current licensing regulation will need to review new players that have emerged to service last-mile delivery [e.g. parcel lockers, PUDOs, p-hailing and other new technologies operated by 3rd party logistics (3PL)].

The new licensing approach would necessitate some mind-set shifts in terms of regulating the courier service in particular since it has emerged as an essential service for social and economic development. As such, MCMC needs to review the existing licensing framework to ensure these new entrants adhere to quality of service and coverage expectations of the industry. The focus of the newly proposed courier service licensing framework is to achieve first-class service through the 4R Strategy namely Reachability (seamless coverage), Reliability (delivery times and customer service), Resiliency (sustainability) and Relevancy (growth in digital economy) (Figure 8).

PAKEJ-Initiative 7 & 8: Courier Infrastructure Network Map and National Address System

Majority of courier service licence holders are competing mainly in urban and sub-urban areas to ensure profitability of its business. However, to date, there is insufficient coverage view of its licensees in order to further develop forward looking policies. To date, there are no visibility on the gaps of infrastructure requirements and coverage areas, which hinders collaboration for a network infrastructure sharing model. Integration of courier service assets and delivery data with MCMC database will allow seamless communication and end-to-end services between customer and delivery companies. Extra emphasis

will be placed on network infrastructure information and delivery performance monitoring for courier service company and regulator. Starting 2020, MCMC has initiated the process of collecting courier infrastructure assets declaration from its licensees aimed at establishing an integrated Courier Infrastructure Network Map updated quarterly with infrastructure location.

Under the Postal Services Act 2012, MCMC has been tasked to develop, control, manage and maintain postcode and addressing system. However, areas defined within the addressing system are inconsistent and thus creating difficulties for courier service companies to do the last-mile deliveries. The industry has raised the need to have accurate address list along with associated geocodes (latitude and longitude coordinates). Pos Malaysia has also been assisting in developing accurate geocodes under the Address For All (AFA) initiative to enhance rural connectivity.

CONCLUSION

The implementation of the National Postal and Courier Industry Laboratory is important to ensure Malaysia remains competitive in the global and ASEAN digital economy through the empowerment of the industry to meet current and future challenges in line with technological changes, market trends and new consumer trends.

The new approach formulated through the laboratory syndication approach has provided the necessary feedback for the government to review the corresponding legislations related to the postal and courier service industry to ensure a competitive industrial environment in line with rapid technological advancements, especially in the digitalisation era. www.mcm.gov.my



PARCEL LOCKERS

THE SOLUTION FOR A SMART FUTURE

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An e-Commerce boom is inevitable. e-Commerce has changed the way customers today shop, prompting businesses to redefine their business models and operations in order to stay relevant. In Malaysia alone, the e-Commerce market has grown so rapidly that it's now estimated to be worth US\$ 4.3 billion¹ (as of 2019, Malaysia's Gross Domestic Product achieved a value of USD364.7 billion²). By 2024, e-Commerce in Malaysia is expected to be worth double the current amount.

Driven by the rise of the internet and smartphone penetration, growing middle class population and tech-

savvy millennials, Malaysia remains the fastest growing e-Commerce market in Southeast Asia.³ In today's pandemic-stricken world, the fear of the COVID-19 virus spreading through cash handling and visiting physical stores has further accelerated this growth.

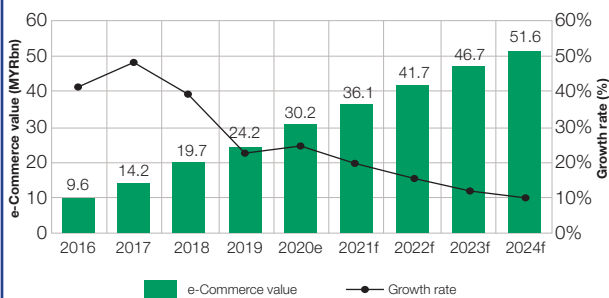
Despite the rapid growth of e-Commerce, delivery continues to be a challenge when it comes to Southeast Asia, with surveys showing that the majority of customers in Southeast Asia are still not happy with their overall e-Commerce experience.⁴ Of these countries, Malaysians top the list as the unhappiest group⁴, with "late delivery" being the highest cited problem (over 90%).⁴ Malaysia

¹ <https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200202-sitrep-13-ncov-v3.pdf>

² World Bank

³ <https://www.globaldata.com/covid-19-accelerates-e-commerce-growth-malaysia-says-globaldata/#:~:text=According%20to%20GlobalData%27s%20E-Commerce,14.3%25%20between%202020%20and%202024.>

⁴ <https://iprice.my/trends/insights/consumers-are-still-not-happy-with-their-e-commerce-delivery-experience-a-new-survey-by-parcel-perform-and-iprice-group-reveals/>

**Malaysia: e-Commerce Value (MYRbn)
2016-24f**


Note: "e" refers "estimated", whereas "f" refers "forecast"
Global Banking and Payments Intelligence Center. www.globaldata.com

Figure 1: Malaysia has observed a steady growth in e-Commerce in the past few years, mostly attributed to the rise of the internet and tech-savvy millennials. (Source: Global Data)

also reports the longest transit time in the region, with deliveries taking an average of 5.8 days versus a regional average time of 3.3 days.

With delivery being the biggest logistical pain point in the entire ecosystem, most e-Commerce professionals spend many sleepless nights thinking of new ways to deliver a superior customer experience to meet the ever-evolving customer expectation that demands for speed, convenience, and optionality. This led to the implementation of parcel lockers.

KEEPING UP WITH THE CUSTOMERS

With over 109 courier service licensees of various categories operating in the country, the Malaysian Communications and Multimedia Commission has recently imposed a two-year freeze on courier service licences from 14 September 2020 to 15 September 2022, a decision that was made to allow the Government along with existing postal and courier companies to strengthen their plans for a sector that sees various challenges due to the changes in technology and market trends.⁵ This new reality means that logistics players must now sharpen the performance and quality of their last-mile services to stand out in an already saturated market, especially when studies show that a growing group of consumers expect faster home delivery yet remain highly price sensitive.⁶

In countries like China, the United States, and Europe, logistics players have been using parcel lockers to meet customer satisfaction in last-mile delivery. In addition to convenience (most lockers will be available 24/7 for parcels pick-up and drop-off), parcel lockers also present an alternative and cheaper solution for customers. This has captured the attention of giant corporations such as Walmart, Alibaba, and Amazon that emerged as the early adopters of the parcel lockers. This new concept of last-mile delivery also works well for a small subset of customers who spend a considerable amount of time away from home or for those who travel for a living and may not have a fixed home address.

As e-Commerce parcel volumes grow, so have the challenges associated with delivery. Take China for example. The country is known to be dominating the global e-Commerce market but e-Commerce players in the country have also seen the issues of failed deliveries, and consumer concerns with home delivery reach a new high. This has led to industry players and customers alike to perceive parcel lockers as an alternative to all their problems.

Hive Box – China’s largest smart locker company – is a great case study. Founded in 2015, it didn’t take long before it grew to have over 14,000 parcel lockers to their network.⁷ By 2020, the network was up to 170,000 banks of lockers, making it the biggest player in China’s parcel locker market.⁶ Today, Hive Box is valued at over \$3 billion USD.

What is it about Hive Box that made it so successful?

For one, Hive Box made diversification a priority and ensured that their product caters to different groups of customers. Besides the usual storage for parcels, the company also developed lockers specifically designed to provide secure storage for sensitive files to businesses. Additionally, their lockers and app interface are also designed in such a way that they can also be used as billboards, with advertisements appearing on the locker screens and in Hive Box’s WeChat accounts.

In China, the e-Commerce market is increasingly driven by shoppers from lower-tier cities, mostly those living outside of their provincial capitals.⁶ In such cases, parcel lockers serve as the bridge connecting sellers to buyers, and vice versa.

A VIABLE AND SUSTAINABLE SOLUTION

Last-mile delivery is the costliest part of the ecosystem,

⁵ <https://www.mcmc.gov.my/en/media/press-releases/pembekuan-moratorium-pemberian-lesen-baharu-perkhi>

⁶ https://www.mckinsey.com/~media/mckinsey/industries/travel%20transport%20and%20logistics/our%20insights/how%20customer%20demands%20are%20reshaping%20last%20mile%20delivery/parcel_delivery_the_future_of_last_mile.ashx

⁷ <https://www.doddl.com/blog/2021/03/29/hivebox-case-study-how-lockers-became-essential-to-chinese-ecommerce/>

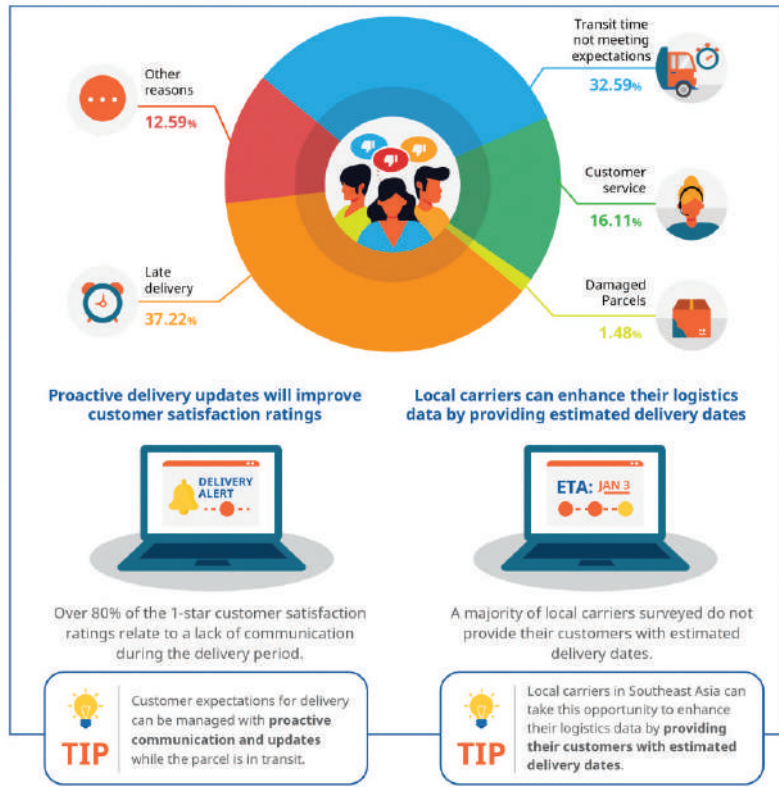
DELIVERY

The Biggest Pain Point in E-commerce in Southeast Asia



Over 90% of customer complaints and negative feedback are tied to transit time and late delivery

Common across the region, positive feedback is usually shorter, with some customers using emojis to communicate. Conversely, negative feedback is more comprehensive and emotional. Bulk of the complaints relate to late delivery and transit times not meeting expectations across the region.



SOURCES: Data for this infographic is from 80,000 e-Commerce consumers across Singapore, Malaysia, Vietnam, Thailand, and Indonesia between April 2018 to October 2018. Data is gathered through Parcel Perform's B2C parcel tracking service Parcel Monitor and analysed by Parcel Perform and iPrice Group.

Figure 2: "Late delivery" is the most cited problem when it comes to overall e-Commerce experience in Southeast Asia. Customers also cite "transit time not meeting expectation" and "customer services" as the other major problems. (Source: iPrice)

when looking at the end-to-end delivery process.⁸ Today, delivery vehicles take up so much space on crowded roads and a delivery process often has to be repeated when customers are not available to receive their parcels physically. Ergo, companies end up spending more on fuel and labour. These are all factors pushing companies to rethink and develop new and sustainable solutions to relieve both sellers and customers from logistical pain points.

Parcel lockers help to save time and mileage with a more efficient routing and fewer failed deliveries. In Poland,

the Department of Robotics and Mechatronics at the AGH University of Science and Technology found that logistics companies using parcel lockers can deliver 600 parcels in a single day, with a travel distance of about 70 kilometers, in comparison to 60 parcels and 150 kilometers in the conventional delivery system.⁹

A similar pattern of increased efficiency was also observed in Seattle, one of the most congested cities in the United States. In the first demonstration of a parcel locker being operated (specifically the Seattle Municipal Tower), it was discovered that drivers were able to reduce their time spent driving to and from the tower by 78%.¹⁰ In the long run, these reduced trips will also result in lower CO2 emissions thus making parcel lockers a more sustainable and environmentally-friendly option for all.

With this new system, drivers had only one location to go to drop off parcels – many of which are located in public areas with high traffic such as transit stations and retail outlets – and customers are also provided with control and predictability, in the sense that they are able to choose where, when, and how they would like to receive their parcels.

Closer to home, Ninja Van has installed over 300 parcel lockers around the country. Covering both Peninsular and West Malaysia, the network encompasses 100% of urban and suburban areas, and 95% of rural areas.

Furthermore, over 98% of LRT, BRT and Monorail stations in the country are also equipped with parcel lockers to meet the demands of modern customers today regardless of where they live.

CREATING NEW BLUE OCEANS WITHIN THE SATURATED RED OCEAN

For a while now, a business strategy is often formed based on the notion of "do what the competition does, but do it

⁸ <https://www.smartcitylab.com/blog/mobility/the-last-mile-issue-how-can-we-solve-urban-delivery-problems/>

⁹ <https://hub.beesmart.city/en/solutions/smart-mobility/last-mile-delivery-solutions-in-smart-cities>

¹⁰ <https://www.washington.edu/news/2018/10/12/lockers-in-transit-stations/>

better.” In today’s world, the notion sounds more like “do what the competition does, but do it *differently*.” This is where parcel lockers come into the picture as a means for businesses to adopt the blue ocean strategy to stand out from the competition.

Although the implementation of parcel lockers has seen much improvement in terms of enhancing convenience and customer satisfaction, there is no denying that there are still certain issues relating to the experience of end customers in the supply chain that have to be defined. In Malaysia for example, rural areas present its own set of unique challenges mainly due to its topography. On top of that, poor infrastructure, such as faulty roads and lack of highways, lead to poor mobility within and into these regions – which is often the primary cause of delays when attempting doorstep deliveries.

In such cases, consolidating deliveries to a nearby pick-up / drop-off (PUDO) point, or parcel lockers, for self-collection can be faster and more efficient. A prominent retail outlet or convenience store, which is frequently visited by locals, may also address the factor of accessibility. An ideal flow would be the consumer visiting the convenience store to stock up on supplies, while simultaneously collecting his or her parcels. This is exactly what Ninja Van envisions, and this is why we have partnered up with over a thousand retail outlets such as 7-Eleven and Tedboy Bakery. Through these partnerships, we have observed firsthand how the implementation of parcel lockers benefit the operator as they get compensated for every parcel collected from their outlet, as well as the increased footfall.

With a set of stringent requirements for all retail partners to comply with when operating a PUDO point, these parcel lockers not only entails the safekeeping of their parcels, but also the customers’ overall experience within the premises of the retail outlet.



Over 98% of LRT, BRT and Monorail stations in Peninsular Malaysia are equipped with the Ninja Box – Ninja Van’s parcel lockers.

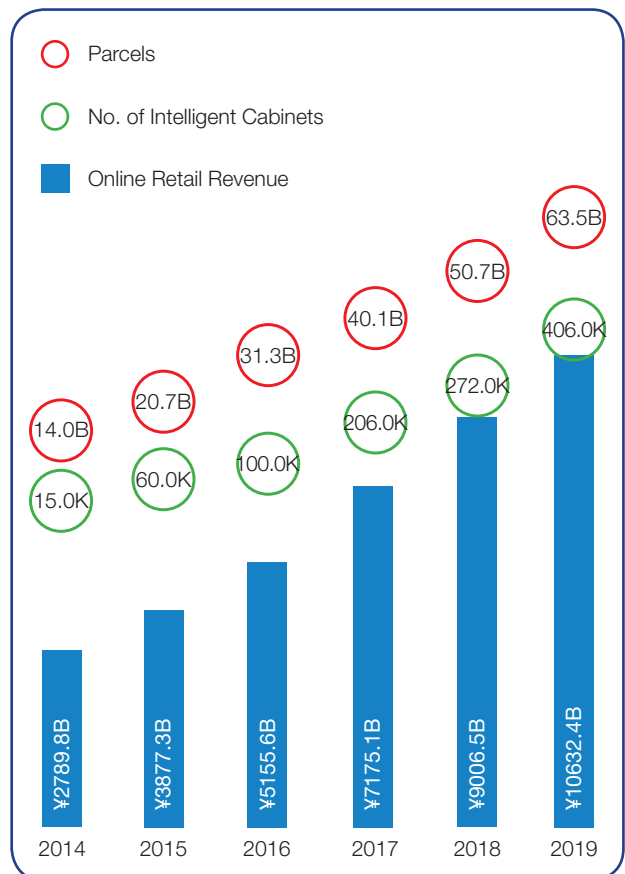


Figure 3: Over the past few years, China has observed the steady growth of e-Commerce revenue, parcel volume and parcel locker installations. (Source: Duddle)

SMART SOLUTIONS FOR A SMART FUTURE

While country-specific transport regulations and safety concerns may present potential barriers to the wider acceptance of parcel lockers, industry players cannot disregard the fact that innovation in last mile freight and parcel delivery solutions could yield significant benefits for all by improving overall customer experience and satisfaction, reducing traffic congestion, and support the ways in which retail outlets diversify their business operations.

The future of logistics is driven by smart solutions, and parcel lockers need to be a part of the equation for a more livable future. Time and again, parcel lockers have proven to be a convenient, flexible, and safe alternative in addition to being recognised as one of the many applications that will be relevant for cities through 2025.¹¹

Unquestionably, parcel lockers are here to stay.

¹¹ <https://www.mckinsey.com/-/media/McKinsey/Industries/Public%20and%20Social%20Sector/Our%20Insights/Smart%20cities%20Digital%20solutions%20for%20a%20more%20livable%20future/MGI-Smart-Cities-Full-Report.pdf>



DIGITAL RESILIENCE CAPABILITY

A CRITERION FOR PERPETUAL DIGITAL TRANSFORMATION

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Digital transformation is inevitable and happening at different scales and scopes. At a higher-order level, digital transformation proliferates changes in society and industries through agile customer experience and enhanced business capabilities. It is not merely about technology adoption and use but also entails a strategic mindset to reimagine and reinvent the core business.

Undoubtedly, the transformation process is not a one-off event but rather a recurring phenomenon. In most cases, digital transformation happens based on pull factors, i.e., the requirements of an organisation. However, certain 'push' factors can also drive digital transformation, such as a crisis. A different level of digital transformation occurs regardless of whether it's a pull or push environment. The basic form of change encompassing the adoption of technologies and tools such as cloud and software-defined networking occurs. At the higher end of the spectrum,

transformation involving advanced technologies such as the Internet of Things (IoT) and comprehensive business analytics is a common phenomenon. As an organisation is settling down with one level of transformation, a re-transformation agenda sets forth, involving the next level of transformation. The critical element that perpetually facilitates the upward re-transformation is the intensity of digital resilience capability, defined as the ability of an organisation to grow and survive in a changing environment by implementing continuously evolving strategies.

CONTEXT OF DISRUPTIONS LEADING TO TRANSFORMATIONS

The year 2020 was certainly a year to remember as it shook humanity to its core. Digital transformation became unavoidable, suggesting that digital transformation is associated with inevitable disruptions emanating

from two sources: information and communication technologies (ICT) and crises-driven disruptions. ICT encompasses both the infostructure (including data and knowledge structures) and the infrastructure (from 5G to IoT) components which affect the competitive potential of a business either with peers in its industry or other companies. The comparisons reflect the extent of differences in terms of the value creation and value delivery capabilities. A case example is the digital twin technology adoption by Newport News Shipbuilding, a subsidiary of Huntington Ingalls Industries in the US¹. This business is regarded as one of the only companies able to design, build, refuel and inactivate nuclear aircraft carriers for the US Navy. The entity has revolutionised its shipbuilding process by incorporating real-time visual management and artificial intelligent diagnosis as part of the smart manufacturing process. These technologies allow simulations when building the new ships, enabling real-time modifications and simulating the final performance before completing the building process. The automation has enabled accurate material requirements and reduced wastages associated with overestimations. Incorporating such integrated digital shipbuilding has also extended to a collaboration with Newport's suppliers, 3D design systems. This is a 3D printing company that uses 'deep material science' to produce additives at a period 75% shorter than the traditional cast methods, an indication of enhanced supply chain efficiencies. These ICT advances are thus a source of disruption to which Newport News' competitors have to respond.

The other disruption source is crisis-driven which seems to be frequently happening in recent times. The global financial crisis in 2008 and the current Covid-19 pandemic showcase the increasing severity of the contagion effect due to the increased interconnectedness of the global value chains. The result has been a severe impact on businesses, sometimes extending over very long periods. So, one may not know the nature of the next crisis or when it will strike, but we know that it will undoubtedly affect businesses and society in general when it does. McKinsey has reported the complicated nature of work-from-home arrangements from business response to the Covid-19 pandemic, yielding mixed outcomes². They observed one company (undisclosed) with two workgroups. The first group had small but highly distributed members in Cape Town, Los Angeles, Mumbai, Paris, and other big cities. The second and more concentrated larger group had a shared office in downtown Chicago. At the start of the pandemic, the business' new leader hastily centralised operations to the on-site group. The new arrangement

worked as remote working began. The smaller group became invisible even when, the larger group began working remotely as well. The larger group was assigned much of the work while the distributed smaller group was left with less or nothing to do. The result was dissatisfied and underperforming employees. The implication is that in crisis circumstances, the business has to find a talent management approach that works. Thus, remote working is only part of the crisis responses. For other companies, responses extend to different extenuating scenarios. For example, in-dining companies had to jump onto online delivery platforms as they found themselves with less to nil revenues due to the strict adherence to minimal physical contact with customers.

DIGITAL RESILIENCE CAPABILITIES

Given these two primary disruption contexts, a business's digital resilience determines an organisation's capacity to absorb the shocks that will affect its existing and future transformations. While there is an argument that digital resilience is about having a good cybersecurity platform and measures, the truth is, the resilience is beyond this. Raguseo et al. (2018)³ recognised essential sets required to facilitate digital transformation, as follows:

1. mindset (*the digital entrepreneurship culture*)
2. toolset (*digital technologies and platforms*)
3. skillset (*digital skills*), and
4. the dataset (*the data ecosystem*)

The interplay of these sets characterises the digital resilience capabilities which embodies preparedness to bounce back after some form of failure. Together these aspects interact to create, deliver and preserve business value. They also determine the likelihood of success for any digital transformation or re-transformation journey.

The **mindset** of digital entrepreneurship culture denotes the strength of the enterprise wide digital savviness, which enables a fail fast, fail a lot, and learn fast mentality. Such a mindset builds a boldness to develop new technologies with a culture of high tolerance for experimentation. Experimentation culture fosters a benchmarking practice - from vertical as well as horizontal perspectives. For example, as a digital lifestyle company, AirAsia Digital can benchmark Amazon for its e-commerce and logistics business. Being struck by the pandemic, AirAsia moved quickly to rebuild and extend its business model by experimenting using existing resources. Such a mindset outlines the digital resilience capability of AirAsia.

¹ Digital Engineering 247 March 26th, 2021. 3D Systems and Huntington Ingalls Industries Collaborate on Metal Printing <https://www.digitalengineering247.com/article/3d-systems-and-huntington-ingalls-industries-collaborate-on-metalprinting/digital-thread>

² A. Alexander, A. De Smet, and M. Mysore (2020) Reimagining the postpandemic workforce. McKinsey and Company, <https://www.mckinsey.com/business-functions/organization/our-insights/reimagining-the-postpandemic-workforce>

³ E. Raguseo, F. Pigni and G. Piccoli. (2018) Conceptualization, operationalization, and validation of the Digital Data Stream Readiness Index. Journal of Global Information Management. 26 (4). pp. 92-112.

Toolset, outlined by digital technologies and platforms, is deployed for any level of transformation. With more technologies advancing, the functional capacities of the customer enabling devices such as mobile phones are constantly changing implying that a digital platform's architecture should be resilient enough to support expanding data structures and its sources. For example, big data promotes the need for advanced storage and analytics, including agile technology and secure computing systems. Such a need enables higher resilience capabilities for potential data acquisition, storage or realtime analysis and insights generation.

In terms of the **skillset**, a business should have a sufficient number of relevant experts whose resilience is built on their continuous skills upgrade, pioneering, and learning. This may also extend to the ability of the business to understand what constitutes the current workforce demands and forecast the company skills by managing the evolving clusters of skills. If a business considers its part-time and full-time employees as its only workforce, it runs the risk of having a narrow perspective of the workforce creating and delivering its value. The contribution of this set to resilience is in managing the workforce ecosystem and the collective evolution of the interactions. For example, research by MIT and Deloitte found the existence of two conflicting realities of digital transformation⁴. The first reality is that every business is increasingly reliant on an external workforce. However, the management practices and processes are built for internal employees.

An efficient skillset organisation should flawlessly manage the value creation and value delivery processes by both the internal and external workforce. For instance, Applause, a United States-based software testing company, has 400 employees but relies on 700,000 crowdsourced software testers in 200 countries which it considers as a testing community. Such a skillset built as a community implies that the resilience capability should enable an effective coordination of these complicated overlapping software user testing projects.

Dataset infers the continuous extraction of relevant data and the insight generation models, and the need for agile storage capabilities. Such a phenomenon is also known as the creation of a data ecosystem. AirAsia is a local example of a business that has prioritised the creation of a data ecosystem. The 20-year-old airline business has evolved its data assets tremendously, driving customer understanding much better than arguably most of its competitors. For them, customer understanding seems to have been at the heart of the most significant business decisions. The re-transformation exercise of Redbeat Ventures to AirAsia Digital demonstrated AirAsia's agility by swiftly rearranging resources to utilise emerging opportunities emanating from the logistics and e-Commerce business⁵. AirAsia's story suggests that a business with an excellent architectural view of the data ecosystem can also shape the business realignment to attain new strategic outcomes.

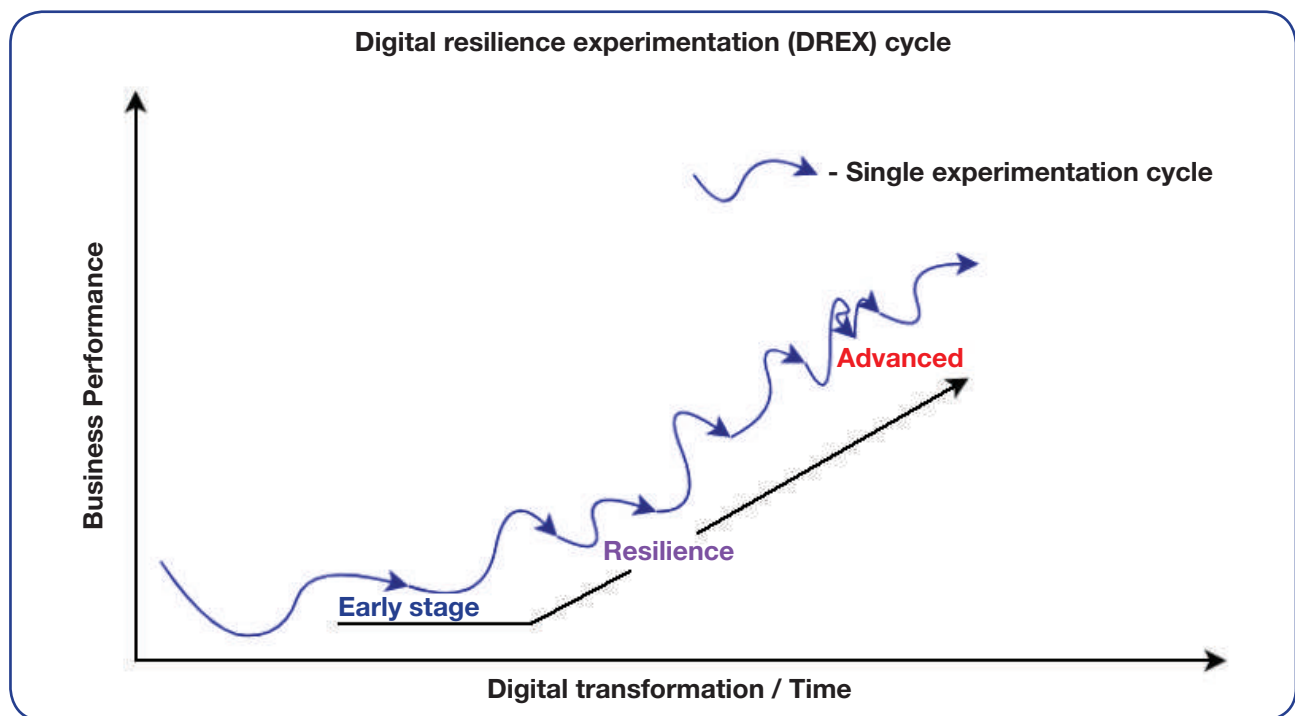


Figure 1: Digital Resilience Experimentation Cycle

⁴ E.J. Altman, J. Schwartz, D. Kiron, R. Jones, and D. Kearns-Manolatos, (April 2021). Workforce Ecosystems: A New Strategic Approach to the Future of Work. MIT Sloan Management Review and Deloitte.

⁵ D. Schaal, (October 12, 2020) Skift AirAsia's Tony Fernandes Talks Digital Transformation in Exclusive Skift Interview. <https://skift.com/2020/10/12/airasia-groups-tony-fernandes-talks-digital-transformation-in-exclusive-skift-interview>

ADVANCING THE RESILIENCE FOR PERPETUAL DIGITAL TRANSFORMATION

The interaction of these four digital resilience elements underpins the capacity for an organisation to respond to disruptions, paving the way for a perpetual transformation agenda (Figure 1). However, the nature of the interaction is dependent on the transformation journey that the business has undertaken. For example, a company with an early-stage transformation will face many hurdles. Much of the transformation activities may happen in a silo characterised by cultural and departmental tensions. Such businesses are failing to build agile systems with many legacy issues hindering the attainment of successful outcomes. The priority, therefore, is to remain resolute so that the organisations reach mature transformation with tangible benefits realised. As per the experimentation cycle, the departmental and cultural tensions weigh in on the change projects resulting in protracted and fruitless experiments.

As the transformation journey advances, the business learns to overcome tensions, resulting in better processes for coordinating digital innovation experiments. The experiments become more frequent as the culture also embraces digital entrepreneurship adopting, for example, agile methodology practices allowing the collaboration of multi-functional teams and several similar projects. The period to optimal process roll-out or new product enhancements becomes faster. With such businesses, the outcome is preparing for the perpetual transformations. This process can culminate in working out a broader number of scenarios, resulting in preparedness for external and internal disruptions. The responsiveness to technological changes becomes swift, with many such organisations determining what technologies are to be adopted and which business models to make the most of the adopted technologies. Such businesses have thriving competitiveness.

THE DIGITAL RESILIENCE AND TRANSFORMATION MODEL

We have determined two contexts of the sources of disruption the ICT and the crisis-driven disturbances (Figure 2). Every business can agree that technological advancement has become consistent and expected, with every enterprise always running some testing or app or platform upgrade. It is either the company is doing it, or the competitors are. On the other hand, while it is challenging to determine when the next crisis is coming, the consequences have been severe every time one has hit. In essence, every business will have to prepare for both scenarios. The level of preparedness depends on

the interplay of the digital transformation and the digital resilience capabilities it has built.

A business with advanced transformation can absorb external disruptions effectively, primarily because of the seasoned experimentations and the learning experience. When the context of disruption is ICT-driven, the business' dynamicity and extensive simulations enable it to reduce the negative impact. For a company with basic or early-stage transformation, the response is different. The business will require time to assess the impact areas and to determine the appropriate response. As the company is figuring out the alternatives, the answer is slow, resulting in a moderate to severe impact on business performance.

On the other hand, when the disruption is crisis-driven, the uncertainty always renders everyone insufficiently prepared. The difference is that the business with advanced transformations has shorter experimentation cycles. This leads to the realisation of a quick re-organisation which provides a digital resilience capability regarded as an adaptive reconfiguration that can either facilitate minor to significant structural business changes. The response of these businesses is akin to the fluidity of river water which has an exceptional adaptive capacity, finding the alternative routes to avoid any obstacles – sometimes circumventing or triggering a flow-around or flow-over depending on the height of the obstruction. The bottom line is that it keeps flowing. This adaptive reconfiguration results in a moderate business impact even in the most severe of circumstances. An example of such a business is AirAsia, which swiftly reconfigured its group business model amid the crisis.

The company is anticipating its e-commerce business (AirAsia Digital) to make the most considerable contribution to the group earnings in the next five years potentially capacitated by AirAsia's fleet, which can run a cross-border logistics arm. The re-organisation facilitates a significant shift of the digital outcomes, from a successful low-cost carrier to a digital travel and lifestyle company.

While this is true for businesses with advanced transformations, entities with fundamental changes are usually heavily damaged if they ever make it. The severity of crisis-driven disruptions is potentially high, but the resilience of these businesses is low because of their low tolerance for experimentations. The lower-level learning capacity results in long rebound or recoveries as the response is mainly reactive. These businesses have no starting point in finding a way out during and post the crisis period. The bulk of Malaysian companies fall under this category, with 34% of companies that participated in the IDC 2020 survey admitting their intention to start implementing transformation in 2021, and 46% have

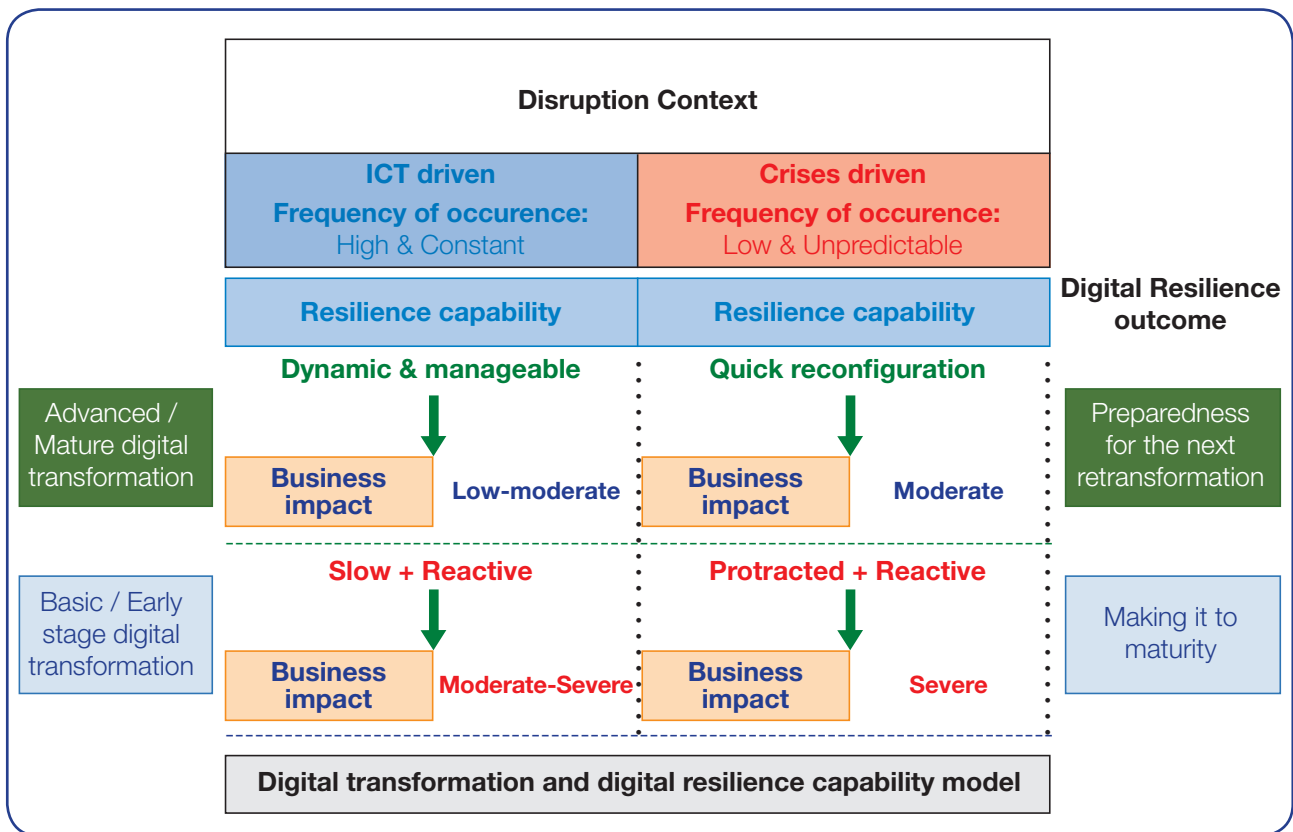


Figure 2: Digital Transformation and Digital Resilience Capability Model

implemented “some” form of digital transformation. Knowing that the success rate of change is still a meagre less than 30% globally, it is reasonable to assume that Malaysia companies have not gone above the global success rate⁶.

Regardless whether the outcome is transformation or perpetual transformation, organisations constantly explore agile options to optimise operations. This happens through series of experimentations comprising of the business units as the customers and the technology experts. A bank may pose a process transformation to reduce the account opening process from 3 working days to 15 minutes⁷. With it will come all the required financial, talent, and technological support. In doing so, the business insulates the teams from structural and cultural tensions by granting them full autonomy when running the experiments. The “fail fast, fail so many times and learn quickly” is a reality with such groups. This model overcomes innovation silos and ensures continuance and

constant monitoring of tasks such that the resilience is in keeping the momentum of the experiments alive.

CONCLUSION

Today’s business environment poses various needs for change, with resilience being at the forefront of digital transformation. Disruptions caused by ICT and crisis (e.g., the Covid-19) foster the role of resilience capabilities across the different magnitude of digital changes.

Organisations experienced in a smaller-scaled transformation display a slow, protracted but reactive response to a disruption, thus moving up the transformation value. When a crisis hits an organisation with a matured level of digital transformation, it will have a dynamic, manageable, and swift reconfiguration resilience capability. Such an organisation is ready to embrace perpetual digital change. [.my](#)

⁶ IDC (2020) Digital Transformation in Malaysia 2020: An IDC infobrief <https://www.gsmathrive.com/wp-content/uploads/2020/10/Maxis-Whitepaper.pdf> (In collaboration with Maxis).

⁷ S. Khanna, N. Konstantynova, E. Lamarre, and V. Sohoni. (2020) Welcome to the Digital Factory: The answer to how to scale your digital transformation. <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/welcome-to-the-digital-factory-the-answer-to-how-to-scale-your-digital-transformation>

STRATEGIC FIT BETWEEN LEADERSHIP CAPABILITIES AND TYPES OF DIGITAL TRANSFORMATION

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For eons, businesses have been evolving, both in their dynamics and in speed, fueled primarily by technological advancements. The emergence of intelligent, digital, and meshed representations of technology is worldwide (Panetta, 2018). Advanced business technologies, such as the Internet of Things (IoT), virtual human-machine interfaces, and Artificial Intelligence (AI), bring forth a significant level of growth to businesses (Brynjolfsson, Hui, and Liu, 2019; Briggs and Buchholz, 2019). However, the optimal effect of technology-driven growth on businesses is not possible if the company is not digitally structured and transformed for this purpose. Thus, digital transformation is about an enterprise integrating its information, infrastructure, processes, and people with digital elements and mechanisms to achieve better efficiency and productivity. Digital transformation is also about the enhanced values that the organisation can provide to its stakeholders deployed through a digital portfolio. The cases of LEGO and Starbucks present an excellent example of digital transformation. LEGO moved up the value chain post restructuring and digital transformation with a new revenue channel from movies, mobile games, and mobile applications. Starbucks focused on building a digitalised customer experience by focusing on their loyalty. Mobile Order and Pay App became their primary digital transformation agenda by providing a convenient and

easy buying experience (Petersen, 2016). In essence, companies such as LEGO and Starbucks experienced new business value exchange and competitive advantage (IDG, 2018) facilitated by digital transformation.

It is essential to understand that digital transformation is necessary for both conventional and digital-native enterprises. For a traditional business, push factors (e.g., technological changes and dynamics in consumer preference, needs, behaviours) foster digital transformation, such as the digitalisation of legacy structures and processes. For a digitally native business, change occurs through its supply chain's advancement (Atluri et al., 2018). For example, companies such as Amazon and Tencent are no longer in a single domain but instead play in the mixed and integrated supply chain funnel. It is important to note that most consumers of digital-native enterprises are also digital natives, with the newness of product or service being the consumption appetite.

Such a scenario is already happening in most countries. In the released 2018 Digital Transformation Index (Newman, 2018), 800 companies indicated a strong affiliation with technological advancement and were willing to embrace changes. In another context, Deloitte Insights (2019)

reported that 45% of corporations had good business growth post-digital transformation, while only 9% of companies planned to cut or defer investments because of COVID-19 (PwC, 2020). The consensus is that most surveyed companies' leaders were actively engaged in digital transformations, with the budget not being used as an excuse for non-participation.

A similar perspective applies to Malaysia, with JENDELA's (Malaysian Connectivity Action Plan) 100 Mbps mobile broadband, 5G connectivity, Gigabit access to 9 million premises, and recent announcement by the PM of Malaysia on MyDigital and Malaysia Digital Economy Blueprint, underpinning the catalysing effect of digital transformation in the country.

The absence of strong leadership would curtail the pursuit of digital transformation. Digital transformation converges technology, architecture, and people together, thus require a new leadership approach and style. Nintex (2018) revealed that nearly 800 US firms lacked the necessary leadership skill to navigate their digital transformation journey. The nature of digital transformation incorporating new business models, innovative value offering, and embracing change requires a continual amalgamation of unique leadership traits. Various management consulting and industrial reports suggested that digital transformation-based leadership entails a different form of leadership traits, inculcating digital congruence, hiring change agents, recruiting & retaining digital-savvy talents, breaking departmental barriers, investing in innovation and engaging in disruption.

TYPES OF DIGITAL TRANSFORMATION

Three types of digital transformation have been identified as characterised by the scope, focus, and scale (Annacone, 2019):

Domain

Domain transformation is about re-defining business value creation by grabbing the opportunity offered by new technologies to serve beyond the existing domain. Uptake of e-commerce platform to capture an extended market by a traditional business is an excellent example of appreciating e-commerce technologies' value creation possibility. The Amazon Web Services (AWS) launch signaled Amazon's foray into Microsoft's previously owned domain and making it a profitable segment. Amazon's entry into this domain was facilitated strongly through its possession of digital assets and capabilities (such as networks and databases), making it more than a mere extension but an entirely different market space.

Business Model

The business model transformation entails transforming

the legacy business model by re-examining the building blocks of value creation and delivery to the market. Such change happens to expand business verticals during a status quo environment or when the situation arises. Companies such as Netflix (on-demand video distribution), Apple (I-tunes music delivery), and AirAsia (teleport logistics and Santan food & beverage franchise) have reinvented their core business model through vertical transformations. Business model transformation requires strategic leadership that delineates the legacy business model with the new model.

Organisational

Organisational digital transformation infers a complete change encompassing structure, mindsets, processes, talent, and capabilities for the digital environment. Organisational transformation entails agile workflows, experimentations, learning via failure culture, decentralisation, and a connected ecosystem. The example of Experian Consumer Credit Agency Company prevails here. The company has undertaken successful digital transformation through agile development and collaboration, enterprise wide. Ideally, organisational digital change is about being a digital enterprise rather than creating value from digital. Organisational transformation requires the agility of making a holistic change and reaping the benefits of such modification.

DIGITAL TRANSFORMATION AND LEADERSHIP

The debate on the value of digital leadership has become significant in recent times due to the impending failures of digital transformation attempts by businesses. The dynamics within the digital environment may sometimes lead to the execution of inappropriately designed leadership strategies leading to digital transformation failure cases. Morgan (2019) outlined examples of General Electric, Ford, and Procter & Gamble failing in their digital transformation efforts due to a lack of efficient leadership toward the quality of transformation, provision of integrated digital solutions and surface-level understanding of business competitiveness. The digital transformation thus requires an evolutionary leadership process. Organisations experience successful digital transformations with committed top management, which deals with cultural and legacy issues. In such cases, the strategic leadership takes the required responsibility in addressing the tensions between resources and culture in fulfilling the transformation strategy. Digital transformation leadership nature, roles, and accomplishments are tied to adaptive transformation, aiming to position the business for perpetual adaptation.

TRANSFORMATION TYPES AND LEADERSHIP

Using data from 645 Malaysian corporations, profiled as

318 private limited and 327 enterprises of micro (21%), small (30%), medium (24%), and large sized corporations (25%), leadership capabilities required across the digital transformation phases were examined. Findings are that the role of varying leadership capabilities seems to be pivotal across the different phases of digital transformation journey.

Domain Transformation and Leadership

Successful domain transformation requires leaders who possess **hybrid skills, know-how, and agility**. A hybrid skill and know-how permeate business-related experience and knowledge, as well as being technically savvy. As Kornferry (2016) pointed out, digital talents with a good skill mix are crucial in leading a digital transformation, although such talents are scarce and in demand. Further, a leader who hails from the millennial timeline may display different hybrid skills than the older generation leader. While a millennial leader may have a better grasp of technological views, their business know-how may not be up to mark, and vice-versa. The reality then is that the inclusion of the leaders with the right hybrid skillsets and knowledge is paramount for domain transformation. Agility, an organisation's capability to adapt to changes in the market, including responsively handling operations and resources to maximise business value, is also paramount for domain transformation. According to Jeanne Ross, a MIT Sloan researcher, agility is significant in a new organisation venturing into the digital transformation realm (Altexsoft.com, 30 Oct 2020). In addition, Forbes Insights 2018 Survey (Forbes Insight, 2018) suggested top leadership's importance in maintaining organisational agility during changes. As the domain transformation is about re-defining business value and its dimensions, the critical leadership capabilities of hybrid skills and agility fit the new business value strategically.

Business Model Transformation and Leadership

Business model transformation is inclusive of making fundamental changes to building blocks of value propositions and creation. For this to happen, digital leadership includes **digital savviness and value creation capabilities**. Leaders for business model transformation need to be digital-savvy entrepreneurs. According to Randstad US 2020 report entitled "Workplace 2025: The Post Digital Frontier" (Williams, 2020), nearly 94% of employees recognised the importance of being at the forefront of the technological curve to lead digitalisation successfully, although 30% of the respondents thought leaders lagged by at least five years behind the arc. Such perspective highlights the importance of digital savviness in pursuing the transformation frontier. Digital savvy leaders can align and configure the fit between technology and business strategy better than the opposite. Notably, such leaders are competent in data-driven growth, thus can view the market innovatively.

The role of value creation capability offers new insight into the evolution of leadership in the digital environment. In a conventional leadership environment, embracing change is about physical asset-driven value creation. An enterprise must invest in buying and storing tangible assets used as sale commodities, depicted as providing value to the market. In the digital environment, however, things are no longer in this way. Airbnb owns no real estate but has created an innovative service value to the market by providing on-demand accommodation. Netflix, on the other hand, owns no cinemas but offers on-demand digital movies. So is Alibaba who owns no inventory but is the largest retailer in the world. Leaders of these organisations have created alternative values by possessing nothing tangible but merely relying on digital business models. Lee and Teo (2016) denominated the value creation possibility using the LASIC principles, i.e., Low margin, Asset-light, Scalable, Innovative, and Compliance easy. Organisations with business model transformation direct their leadership efforts within the LASIC parameters. Such change requires a low-margin business with asset-light operations. The model should be scalable based on growth and innovative enough to sustain the business model for several years. Notably, the business model should comply with regulatory requirements. Cases exist where the innovative business model does not fit into an existing regulatory framework, thus challenging the growth. For business model transformation, compliance with the current regulatory framework is essential to safeguard sustainability

ORGANISATIONAL TRANSFORMATION

Organisational transformation is the higher-order digital transformation integrating all elements, including structural, process, cultural, resource, and technological. In this transformation, digital entrepreneurship capability proliferates a highly evolving and diverse leadership trait entrenched in digital opportunities. Leaders of this nature capitalise on digital opportunities by embracing digital transformation (Antonizzi and Smuts, 2020). Digital entrepreneurship is entrepreneurial opportunities created and pursued through technological platforms (Giones and Brem, 2017). When organisational transformation occurs, digital entrepreneurship capability becomes crucial as a leader needs to balance between being a supplier and a buyer within the digital environment (Hull et al. 2007). A leader with digital entrepreneurship traits would strategically lead in the context of digital knowledge base, digital business environment, finance accessibility, digital skills, and business culture. Organisational digital transformation requires positioning the knowledge base to support digitalisation-learning journey while enabling expansion of the digital supply chain.

TRANSFORMATION IS ESSENTIAL FOR BOTH CONVENTIONAL BUSINESSES AS WELL AS DIGITAL NATIVES (PUSH VS PULL) WHICH CREATES THE NEW BLUE OCEAN WITH INNOVATIVE DIGITAL SERVICES, WHICH IN TURN CREATES THE NEW DIGITAL ECONOMY



For the above, the digital transformation process becomes dependent on a concise and clear digital strategy understood and backed by the organisation strategic leadership team (Matt et al., 2015; Mhlongu et al., 2019). They need to (i) quickly understand the customer and reimagine offerings (Bongiorno et al., 2018), (ii) understand the appropriateness of enabling technology (Kane et al., 2015; Mhlongu et al. 2019) and (iii) cut implementation time (Govindrajana and Immelt, 2019)

Figure 1: Transformation is essential for all businesses

Furthermore, a digital leader deploys the appropriate strategy to facilitate and maintain accessibility to operational and growth funds. Financing options are complemented by the presence of the right digital skillsets within the organisation. For this purpose, both external hiring and internal training exercises will take place. Ultimately, digital leadership for organisational transformation tackles the seamless evolution between legacy and new order business culture. Such positioning is vital to ensure minimal hick-ups and a quick adaptation to the change.

SUMMARY

Various anecdotal and scholarly works of literature are available on digital transformation & digital leadership, especially in recent times. The accelerated digitalisation during the Covid-19 pandemic boosted the extent of research on this topic. However, research about digital transformation has relegated to discussion about the types of digital transformation. The scale, requirement, scope, and identity of a business operation determines the type of digital transformation, be it domain, business model, or organisational. Every kind of change requires a different set of leadership traits and capabilities to achieve before and post-transformation success. There must be a strategic fit between the leadership capabilities and the type of digital transformation. After all, transformation failure is not an option. [my](#)

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WHAT DOES IT TAKE FOR A CITY TO BECOME SMART? PEOPLE!

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The year 2007 marked a significant milestone in modern urban living. It was the year that the number of city dwellers tipped the number of those living in rural areas. And this number is not expected to slow down anytime soon, with almost two-thirds of population expected to live in urban areas by 2050.

This mass migration to the cities has inevitably put a strain on city resources (water, energy, space etc) and gave rise to social issues (congestion, job scarcity, health care, education, etc). City authorities, developers, town planners, and all those tasked with providing city dwellers with a better standard of living are forced to find solutions that are better, cheaper and more efficient. Thankfully, the advancement of information and communication technology (ICT) supporting these services are at such an advanced stage that the stakeholders can leverage on these technologies to ensure a better quality of life for its inhabitants. These are already visible in many cities globally today, such as digitalisation of city services, GPS tracking of public buses, digital control of city traffic, electronic transactions for city-related transactions, as well as the usage of Artificial Intelligence (AI) and Internet of Things (IoT) technology, to name just a few.

Hence the term “smart cities” is coined where authorities and vendors alike embark on initiatives that leverage on ICT and technology to provide city dwellers a better quality of life. An early paper describes it as a city that is independent, self-decisive and aware of its citizens. Industry players soon followed, with service providers such as IBM and Hitachi all joining into the foray to attempt to define what a smart city is.

BUT WHAT EXACTLY IS A SMART CITY?

Is a smart city a city filled with flying cars, teleportation capabilities, hologram pets and service robots? Or are smart cities merely a natural progression of urban progression? Perhaps smart cities are no more than just corporate business plans or corporate storytelling perpetrated by the smart city vendors for their own benefits? Are cities that declare themselves “smart” being “self-congratulating” with no actual tangible positive benefits? Early literature indicate that smart cities were initially very focused on futuristic utopian hi-tech cities. However, literature also shows that this technology-driven approach is not the most ideal.

The Songdo project in South Korea is an example of how a technology-driven smart city can potentially fail. It started with the noblest of intentions: Songdo International Business District aimed to “banish the problems created by modern urban life”. Today, often dubbed as a “Chernobyl-like ghost city”, this mega billion dollar project has failed to attract investors and inhabitants. It seemingly had all the ingredients needed to make up what was thought to be a smart city: sensors built into city infrastructures, neighbourhood connected via video connectivity, traffic autonomously managed, etc. But with all its technology advancement, Songdo was deemed as a failure, and could not attract “normal” people, hence the sterile feel to the city.

Following the lacklustre performance of Songdo and other similar technology-led smart cities, many cities have instead adopted a more city-led approach. This is where the city itself defined what is required in their respective cities, with technology as an enabler instead of a leader. An example of a city-led smart city is Seoul, South Korea, where there are many top-down initiatives and city-driven programs that capitalise on technology.

Then of late, many cities have begun to become smarter from a more bottom-up approach, with the needs of the citizens as the starting point. Smart services are co-created by the citizens and the market, most times independent from any city-driven initiatives. Citizen participation and public inclusivity are paramount in this type of smart city.

In a 2015 article, Cohen B. described the three generations of smart cities, summarised as follows:

- Smart Cities 1.0: Technology Driven
- Smart Cities 2.0: City Driven, Technology Enabled
- Smart Cities 3.0: Citizen Co-Creation

A TALE OF MANY CITIES

Many cities around the world have embarked on their own smart city initiatives. The Seoul Metropolitan Government issued the 2030 Seoul Masterplan, which aims to provide a “Happy City of Citizens with Communication and Consideration”. In Moscow, the “Smart Moscow 2030” strategy is based on six main areas: development of social and human capital, digital mobility, smart economy, comfortable urban environment and digital government.

Malaysia is also actively embarking on our own smart city initiatives. The Kementerian Perumahan dan Kerajaan Tempatan (“KPKT”) issued the Malaysia Smart City Framework as a guide for local authorities. Individual states and cities have also initiated their own smart city plans to realise the smart city dream. The Selangor Smart City Blueprint, Kuching Smart City Masterplan, Kementerian Wilayah Persekutuan’s My Smart Wilayah 2030 are but just some of the many examples.

What can be deduced from the many examples of smart city initiatives around the globe as well as on our own shores is that: all these different smart city initiatives have their own unique approaches, addressing their own unique challenges. Each city has its own set of unique problems, and hence its own set of unique needs. Furthermore, each city is at its own stage of urban development, which in turn will determine its own set of priorities.

Hence there should be no generic theme when approaching smart cities. There should NOT be a one-size-fits-all cookie-cutter approach to building smart cities. What works in Seoul would not necessarily work in Selangor, and the problems in Moscow needs a different set of resolutions from the problems in Istanbul.

PEOPLE FIRST

However, what is common among all cities around the world is: a city is made up of its people. It is the citizens of the city that define the city, its uniqueness, its idiosyncrasies, its quiriness, that make the city different from the rest of the world.

A city is about the people, their pains, their worries and their everyday lives. Hence, any smart city project must first and foremost take into consideration the needs of the people in the city, over and above any other considerations.

Additionally, the people in the city comprise of multiple personas, e.g. the citizens themselves, the office workers, students, municipal workers, retailers, tourist etc. All of them, in their different personas and capacities, would face different sets of problems that require different sets of resolution on different types of business models based on different types of affordability. Trying to adopt a cookie-cutter approach across all types of users without considering the different personas’ needs would be a recipe for disaster.

Identifying the user needs as a basis of any smart city project is crucial because it is through this exercise that the smart city practitioners can understand what the users actually need, what they are thinking about, what their pain points are, how they behave, and what their motivations are.

Furthermore, it’s the people and city community itself that can propel the success of their city. Organic participation from within the city would foster a higher sense of belonging that would in turn increase the sustainability of any city initiative. On this note, another important element towards ensuring the sustainability of any smart city venture would be to involve as many existing players within the community ecosystem, including local vendors, system providers and operators. This way, the entry barrier is considerably lowered as there is less disruption to the existing balance. The sense of inclusivity will encourage better adoption and less resistance.

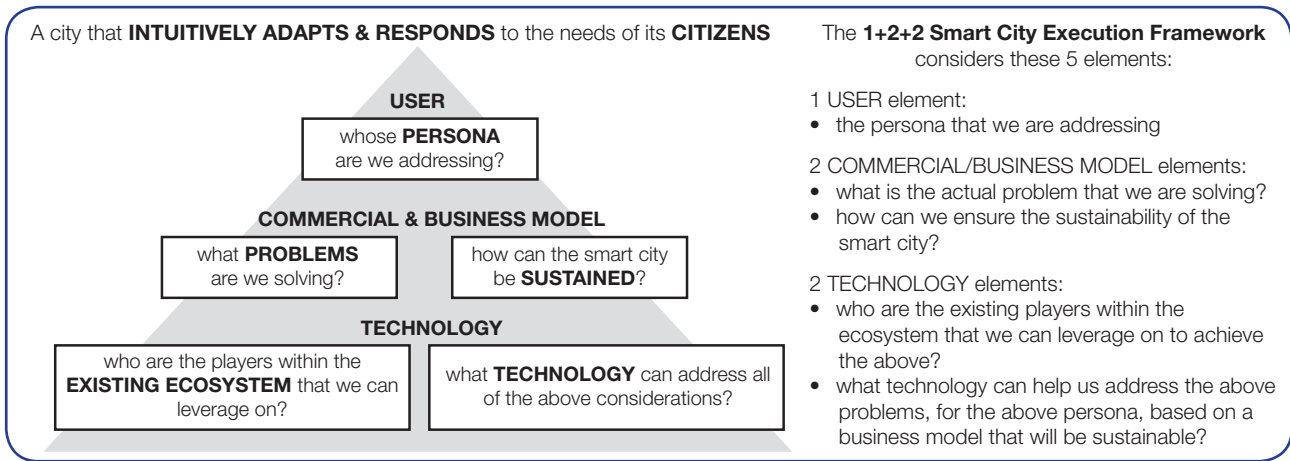


Figure 1: 1+2+2 Smart City Execution Framework

TECHNOLOGY SECOND

The technology that is to be introduced to any smart city project should be identified only after the actual problems and the respective persona above have been identified, not the other way round. The technology should address the specific needs of the user, within the affordability of the city. Though this may seem rather obvious, we have often seen smart cities built around technology, supposedly the latest most advanced gadgets and machineries that will propel the city into the next century. Unfortunately, when these machines were deployed without thorough consideration of the city's actual needs, many of the machines became white elephants. Or even if the city found some benefits out of them, they turned out to be too costly for the city to maintain and the cost far outweighs the returns that the city can hope to achieve, thus making those solutions unsustainable.

SMART CITY KEY SUCCESS FACTORS

Although there are different approaches to smart cities that are adopted by the different cities around the world, there were nonetheless a few common elements observed. These are:

- Connectivity**
 Any smart city is dependent on the ability of the city to interact with its citizens. And this can only be done if the connectivity infrastructure is in place.
- Availability of services**
 Ample smart city services must be made available to its citizens. Sufficient applications must be available for the citizens to run their daily tasks, and the services must be made available to them easily, through devices that they already own.
- Data sharing**
 Any smart city needs to have sufficient data for it to be able to effectively and efficiently understand the needs of its citizens. It is imperative that different players and stakeholders share all relevant data with the relevant members within the smart city ecosystem, so as to enable them to come up with even more meaningful city services.

- Inclusivity**

The higher the level of public participation, the higher the chances are for the smart city to be sustainable and successful. When citizens feel more engaged, they feel more ownership towards the smart city initiatives. Similarly, the more the smart city includes the existing players within the city, the less resistance there would be to any new initiatives being introduced.

Additionally, from the case studies conducted, most cities seem to be somewhat in agreement that technology should NOT be the starting point to a smart city. Instead, the starting point of a smart city should be the needs of its people. Technology should merely be an enabler to meet those needs!

CONCLUSION

Based on all the above, the following description of a smart city is submitted:

a smart city is any city that **intuitively adapts and responds to the needs of its citizens**

This description breaks down the smart city into three characteristics:

- The city must be able to **act intuitively**, with minimum human intervention;
- The city must be able to on its own **adapt and respond**; and
- The city must be able to address the **specific needs of its citizens**.

The approach presented above can be summarised in the following practical 5-element 1+2+2 Smart City Execution Framework.

When all 5 elements above are fully considered, then the city would be able to achieve the three desired smart city characteristics: intuition, adaptability/responsiveness, citizen needs. And when a city successfully achieves all three of these characteristics, only then can it be considered a "smart" city.

Therefore, a city is only smart, if the citizens perceive that it is smart. 

5G

RECENT DEVELOPMENTS IN 5G EMF POLICIES, GUIDELINES, RADIATION MEASUREMENT AND MONITORING

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The fifth generation of mobile networks (5G) is a significant evolution of the fourth generation (4G) networks. 5G has been designed to meet the extensive growth in data and connectivity of today's modern society, the Internet of Things (IoT) with billions of connected devices. The deployment of 5G cellular technology will see the evolution and expansion of current 4G networks and the introduction of new radio access networks at higher frequencies, up to the millimetre wavebands. Due to the use of these higher frequency ranges, the number of 5G base station installations will substantially increase as compared to 4G for the same required coverage area. The installation of these networks includes a range of deployment such as small cells and advanced antenna technologies. Massive multiple input multiple output (MIMO) antennas will allow the use of very narrow beams that will follow the user with an impact on the surrounding exposure level different from the current system (as shown in Figure

1). It is recommended that an impact analysis of 5G mobile systems implementation with respect to the exposure level of electromagnetic fields (EMF) around radiocommunication infrastructure is conducted prior to the launch of 5G deployment.

ELECTROMAGNETIC RADIATION CONCERN IN 5G

5G and the associated new technologies such as beamforming and frequencies above 3 GHz have raised a large number of discussions among the population. As illustrated in Figure 2, beamforming is applied to almost all 5G signals, in particular on data channel related signals (PDSCH etc.) and synchronisation signals (SSB).

3GPP defined new bands such as the frequency bands of 3200 MHz to 4200 MHz, as well as in the mmWave range, raise health concerns, in particular with regard to

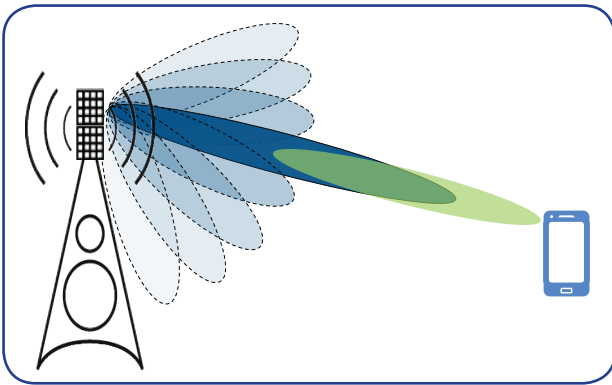


Figure 1: 5G base station multiple input multiple output beamforming antenna

increased electromagnetic radiation resulting from higher frequencies combined with beamforming. Consequently, the 5G rollout is slowing down in several countries until it is proven that the radiation is below a certain country-specific threshold. The radiated power is also increasing, and operators and governments have to ensure that the total radiated power (and electromagnetic pollution) is below these thresholds.

MEASUREMENT OF ELECTROMAGNETIC POLLUTION

Measurements which demonstrate that electromagnetic pollution is below a certain threshold are called electromagnetic field (EMF) measurements. On-site measurement shall be performed to analyse and confirm the actual EMF exposure at site and its surrounding areas. Measurement or evaluation shall be made in the areas, which are known to be accessible to public and workers, and shall be performed at one location or area, known as the measurement area.

There are two established measures for EMF measurements:

- Electric flux density in W/m^2 (denoted as S_{inc})
- Electric field strength in V/m (denoted as E_{inc})

Both measures are based on power measurements (in dBm unit). By applying the antenna factor (in dB/m) and/or the

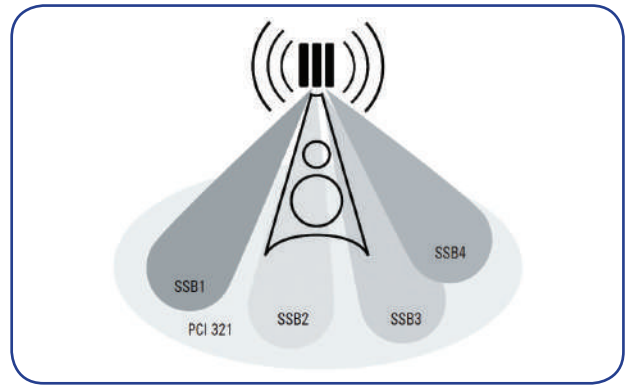


Figure 2: 5G cell with PCI 321 is divided into several synchronisation beam areas (SSB)

antenna aperture (in m^2), power measurements can be converted into either electric flux density or electric field strength.

The antenna aperture is measured in m^2 . It can be visualised as an increasing antenna surface with increasing antenna gain. The larger the antenna surface, the more electromagnetic energy is captured. A passive receiver measures the received power in dBm based on signal-specific Reference Signal Received Power (RSRP) values, which can easily be converted into W by removing the logarithmic scale. The relation of both parameters is in W/m^2 and is called electric flux density (S_{inc}) and electric field strength (E_{inc}).

With air being the propagation medium for electromagnetic waves in this case, the corresponding characteristic wave impedance Z of 377Ω can be used in order to convert into electric field strength in V/m by a square root operation.

DEVELOPMENT OF 5G EMF EXPOSURE POLICIES, GUIDELINES AND STANDARDS

The standardisation work on 5G EMF is currently ongoing in many international bodies including ITU, ECC, ETSI

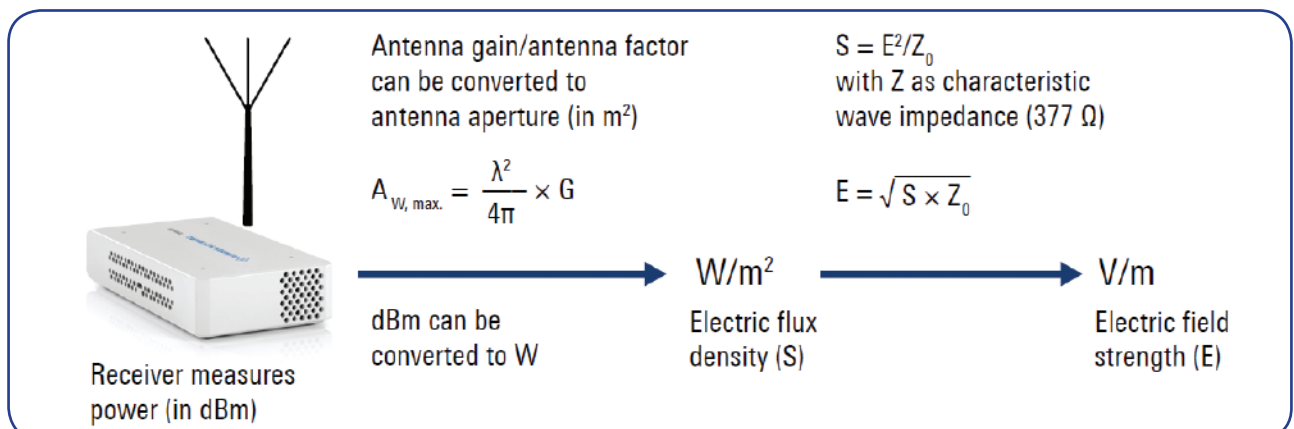


Figure 3: Relationship of power, electric flux density (S_{inc}) and electric field strength (E_{inc})

Exposure scenario	Frequency range	Incident E-field strength, E_{inc} (V m ⁻¹)	Incident H-field strength, H_{inc} (A m ⁻¹)	Incident power density, S_{inc} (W m ⁻²)
Occupational workers	0.1 MHz - 30 MHz	$660/f_M^{0.7}$	$4.9/f_M$	N/A
	> 30 MHz - 400 MHz	61	0.16	10
	> 400 MHz - 2 000 MHz	$3 f_M^{0.5}$	$0.008 f_M^{0.5}$	$f_M/40$
	> 2 GHz - 300 GHz	N/A	N/A	50
Public	0.1 MHz - 30 MHz	$300/f_M^{0.7}$	$2.2/f_M$	N/A
	> 30 MHz - 400 MHz	27.7	0.073	2
	> 400 MHz - 2 000 MHz	$1.375 f_M^{0.5}$	$0.0037 f_M^{0.5}$	$f_M/200$
	> 2 GHz - 300 GHz	N/A	N/A	10

Table 1: Summary of ICNIRP 2020 reference levels for EMF exposure from 100 kHz to 300 GHz

and 3GPP. Two international bodies, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and Institute of Electrical and Electronics Engineers (IEEE) have developed exposure guidelines and defined exposure limits in terms of specific absorption rate (SAR) and electric and magnetic field strength and power density in the 5G frequency band. These exposure limit guidelines form the basis of policy and regulation in many countries. However, exposure limits differ in some countries and in some cases are more restrictive. ITU recommends that for the case of the radio frequency (RF) EMF limits do not exist (i.e., the signal does not cover the frequencies of interest), then ICNIRP limits should be used. The World Health Organization (WHO) concluded in its review that EMF exposures below the limits recommended in the ICNIRP international guidelines do not appear to have any known consequences on health. The summary of the exposure limits to EMF (100 kHz to 300 GHz) from ICNIRP latest guideline (May 2020, Volume 18) is shown in Table 1.

Exposure guideline limits for EMF workers are higher than for the general public because workers are adults who are generally exposed under known conditions and are trained to be aware of potential risk and to take appropriate precautions. Sufficient information or signs should be provided to ensure that other workers who have not received specific EMF training can take measures to avoid exposure above the relevant limit.

Even though ICNIRP provides the EMF exposure limit with respect to frequency range and exposition time, it does not include the technical methods on the exposure

determination based on modulation, technology, radiation pattern and wireless services. For base stations with massive MIMO systems, the evaluation method requires the appropriate RF exposure assessment approaches based on actual maximum transmitted equivalent isotropically radiated power, taking into account time averaging as defined in the international exposure limits. Massive MIMO antennas produce a number of simultaneous narrow beamwidths directed to individual users to optimise communications. The power fed to the antenna is therefore split between users and the instantaneous directivity adjusted; i.e. massive MIMO antennas have different directivity for each individual communications channel. Therefore, if the RF field strength is evaluated in one fixed position near the base station, the measured value will vary significantly from time to time.

The International Electrotechnical Commission (IEC) is an international standards organisation that prepares and publishes international standards for all electrical, electronic and related technologies. This include the technical details for determining the RF EMF exposure limit based on the characteristics of the signal technology, and to be benchmarked against the country or ICNIRP limit. The IEC published the documents IEC 62232:2017 and IEC TR 62669: 2019 which specify the RF exposure evaluation methods to be used for product compliance, product installation compliance and in-situ RF exposure assessments. These documents take into account the specifications for performing RF exposure assessment based on the actual service of a base station, as well as the radio antenna technology including Massive MIMO beamforming of the 5G base station.

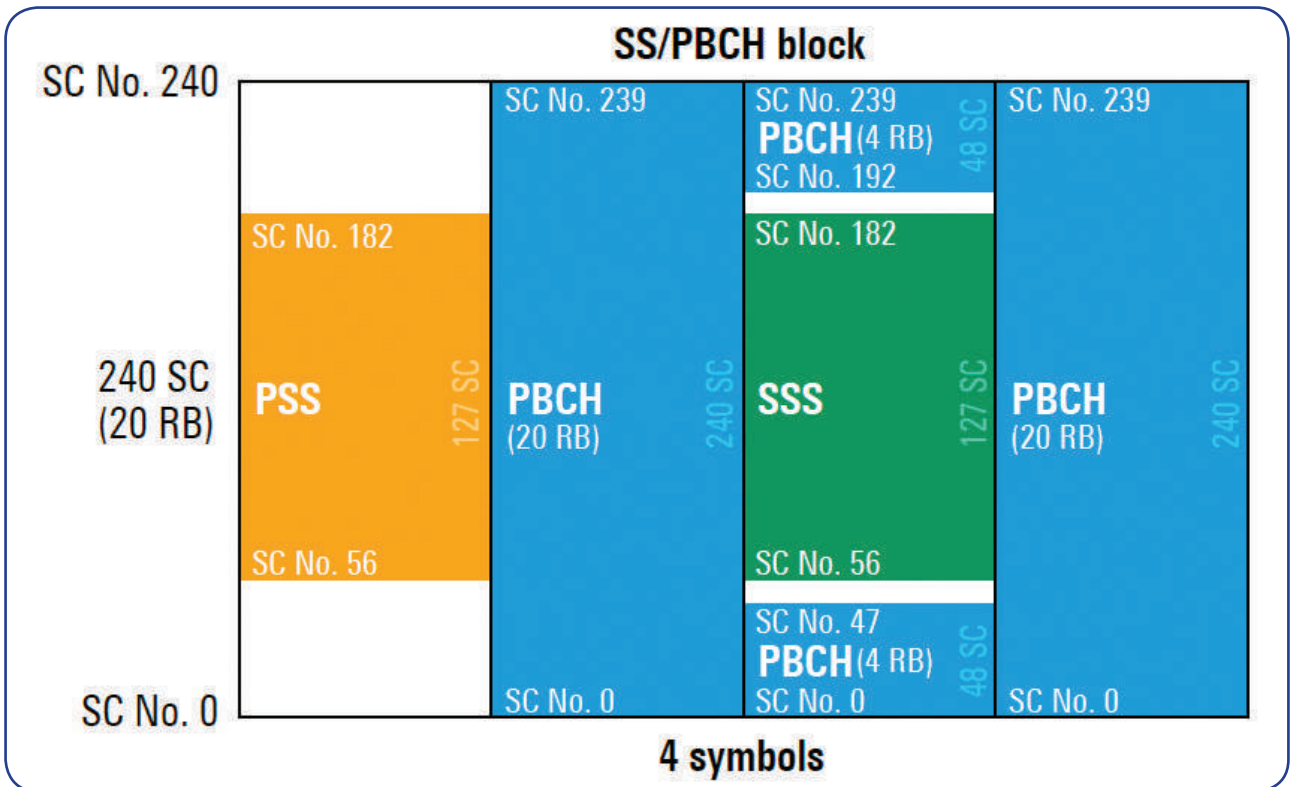


Figure 4: 5G signal synchronisation signal block

5G SIGNAL STRUCTURE AND CHARACTERISTICS CONSIDERATION FOR EMF EXPOSURE DETERMINATION

In previous cellular technologies (4G LTE), cell-specific synchronisation and reference signals were used. The always-on reference signals were spread over the entire spectrum for precise channel estimation. The 5G cell-specific signals have a completely new approach. 5G base station only broadcasts a minimum amount of cell-specific signals with a known sequence that can be measured by a calibrated measurement receiver. All other signals are UE specific; their appearance in the frequency and time domain is related to data traffic.

The only always-on signal in 5G is the synchronisation signal block (SSB). As shown in Figure 4, each SSB occupies 240 subcarriers (frequency domain) and 4 symbols (time domain). It contains primary and secondary synchronisation signals (PSS and SSS) and the physical broadcast channel (PBCH). As in 4G LTE, the PSS and SSS in 5G NR represent the physical cell identity (PCI), and the PBCH carries the master information block (MIB) plus a few additional payload bits.

Zooming into the subcarriers would show the demodulation reference signals (DM-RS), as shown in Figure 5. The DM-RS are used by the UE for channel estimation to demodulate the PBCH. The positions of the DM-RS signals across the PBCH are determined by the PCI.

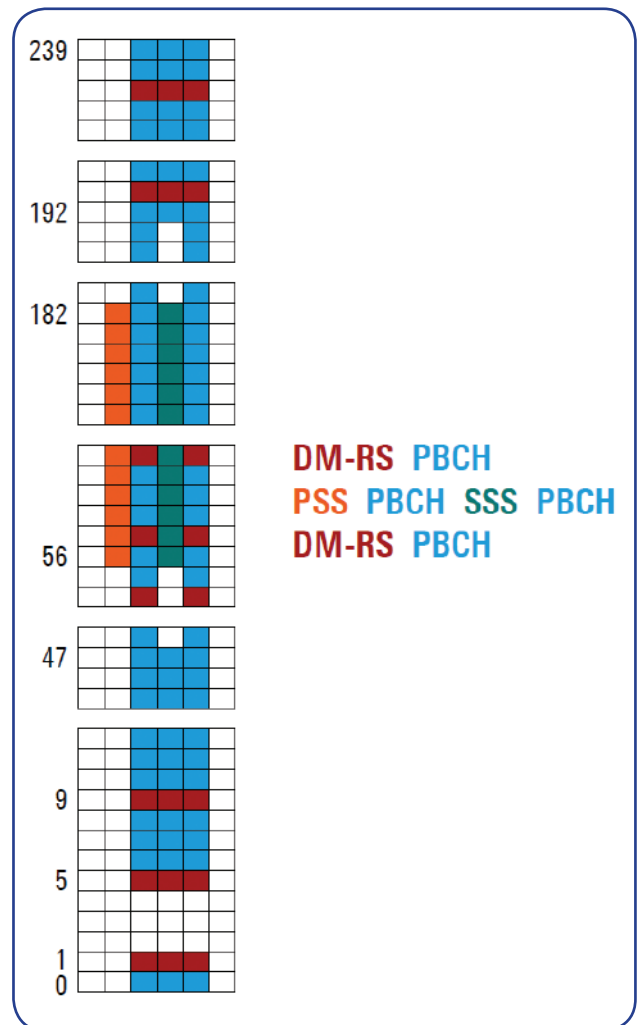


Figure 5: 5G synchronisation signal block within the subcarriers

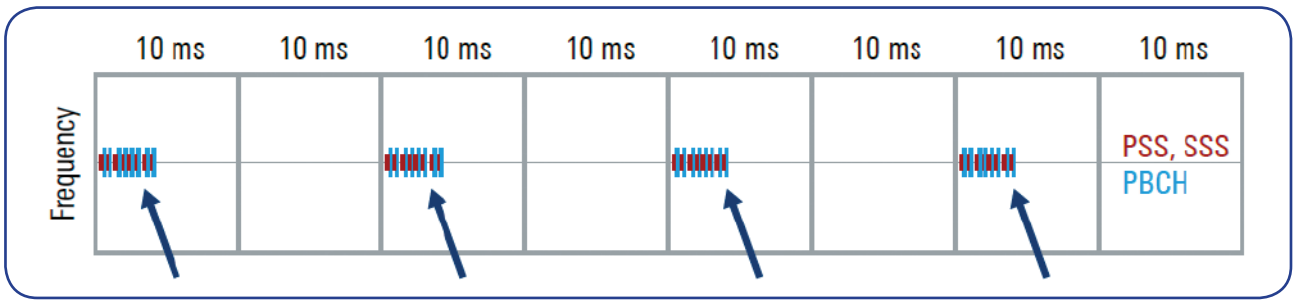


Figure 6: Periodically broadcasted 5G synchronisation signal blocks, for 20ms case

SSBs are transmitted periodically from each cell. 3GPP has defined five transmission patterns: case A to case E. The frequency range, the maximum number of SSB transmissions, the subcarrier spacing and the start OFDM symbols define the cases. SSBs are organised in burst sets, with a burst set consisting of one or more SSBs. L_{max} denotes the maximum number of SSBs that can be configured for the different cases. For higher frequencies the number is significantly higher ($L_{max} = 64$) than for the frequency range below 1 GHz ($L_{max} = 4$), which reflects the need for more and smaller beams in the cm/mm wave spectrum. Each SSB has an index with an increasing number from 0 to $L_{max} - 1$.

The 5G signal periodicity can vary between 5 ms and 160 ms (the example in Figure 6 shows 20 ms). The 3GPP standard recommends using a periodicity of 20 ms for cell-defining SSBs. Higher periodicities such as 80 ms or 160 ms are preferably used for SSBs in mmWave networks to allow more time for the transmission of a higher number of SSBs in cases D and E.

In 5G, beamforming is an essential method to overcome the increasing path loss when using higher frequencies. This is also used for the SSBs that can be individually beamformed and preferentially cover a certain geographical area. In the example shown in Figure 7, one cell is transmitting six SSBs ($L = 6$), meaning the SSB is transmitted six times, each time with a different value of the SSB index. If SSB beamforming is enabled, each SSB is transmitted on different spatial beams.

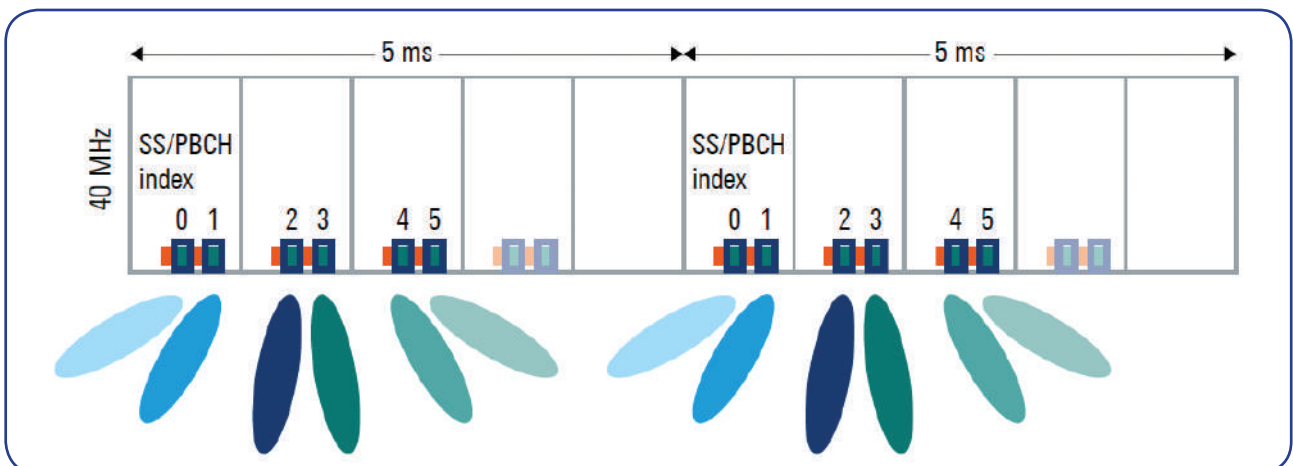


Figure 7: Example of SSB transmissions

5G SIGNAL STRUCTURE AND CHARACTERISTICS CONSIDERATION FOR EMF EXPOSURE DETERMINATION

5G intelligent antenna arrays create very narrow but high-gain beams to focus the power on a certain area to increase SINR and received power. The assessment method should consider for the maximum emission approach rather than just the current emission approach for 5G on-site EMF measurement. The measurement needs to identify, decode carriers and beams of the 5G site. Estimation/calculation of the worst-case electromagnetic field at the 5G site to be made using extrapolation factor. To evaluate the exposure level for maximum traffic conditions by extrapolation, it is important that the transmitted power of the received signal or channel is not dependent on the amount of traffic. The measurement should be made using a known antenna (antenna factor is available) and a fast survey at the base station is made to ensure no emissions from other transmitters in the area.

With a minimum of broadcasted cell-specific signals and layer 3 messages, similar factors have to be applied for reliable 5G EMF measurements. The considerations that should be made for the extrapolation of 5G EMF are:

Beam/gain offset between SSB and data beams

- It is expected that data/UE specific beams have a much lower beamwidth and/or more power than SSB beams

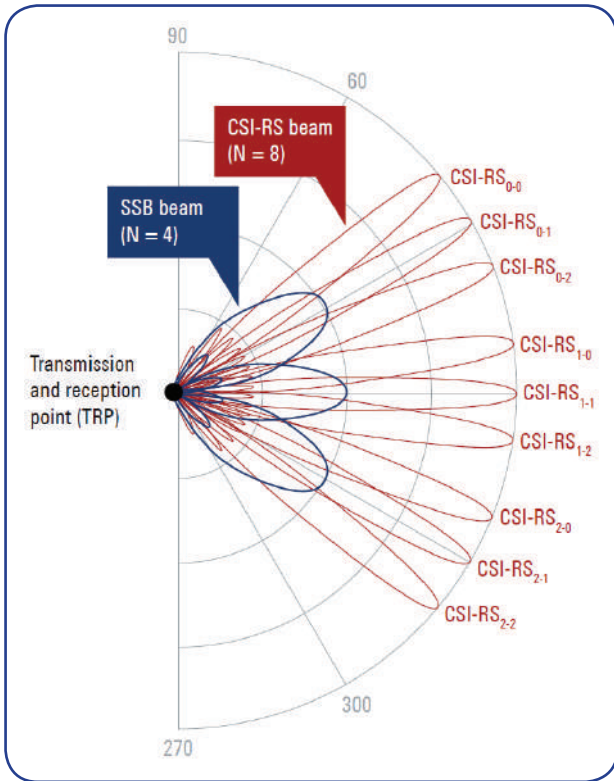


Figure 8: UE specific data signal (CSI-RS) is transmitted using narrow beams and higher power compared to SSB beams

to further increase the SINR. The corresponding data either to be measured with the RF scanner or to be requested from the network operators or network vendors. Figure 8 illustrates the gain difference between the SSB beams and the data beams (CSI-RS).

Uplink and downlink relation factor

- In the case of TDD, the relation between uplink and downlink significantly affects the radiated power by the 5G base station. In this case, if more slots are

reserved for uplink, the radiated power decreases. The relation factor depends on the network configuration, which may be requested from the network operators. An exception is Non-Standalone (NSA) networks, where the 5G carrier is used for downlink only. Figure 9 shows the Example of UL/DL sequence in 5G NR TDD stand-alone network.

Projection of Synchronisation Signal Block Power on the total 5G NR Carrier Spectrum

- 5G NR Synchronisation signal blocks (SSB) only have a bandwidth of 3.6 to 7.2 MHz depending on the subcarrier spacing. The total bandwidth of 5G NR carrier can be up to 400 MHz. This requires extrapolation factor, which can be requested from the operators or be determined by using a mobile phone with an active subscription for the 5G NR network. Illustration of the SSB from the total 5G NR carrier spectrum is shown in Figure 10.

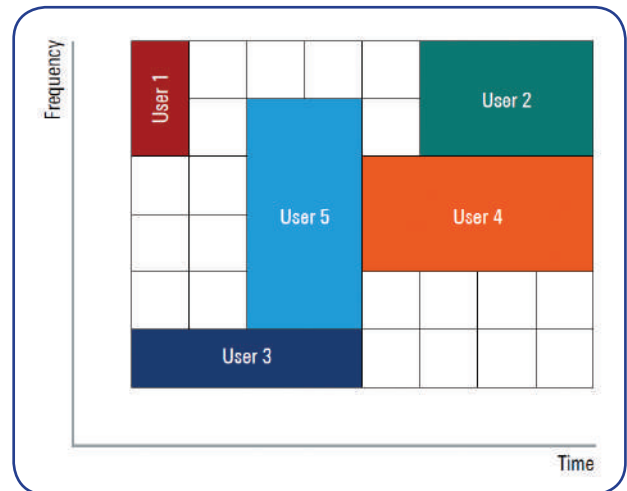


Figure 9: Flexible scheduling of user data (uplink and downlink) in TDD network



Figure 10: Extrapolation of SSB power to full 5G carrier spectrum

SCS [kHz]	Bandwidth (MHz)												
	5	10	15	20	25	30	40	50	60	70	80	90	100
15	300	624	948	1272	1596	1920	2592	3240	n/a*	n/a	n/a	n/a	n/a
30	132	288	456	612	780	936	1272	1596	1944	2268	2604	2940	3276
60	n/a	132	216	288	372	456	612	780	948	1116	1284	1452	1620

Table 2: FBW for each combination of BS channel bandwidth and SSB subcarrier spacing (SCS) for sub-6GHz signals

SCS [kHz]	Bandwidth (MHz)			
	50	100	200	400
60	792	1584	3168	n/a
120	384	792	1584	3168

Table 3: FBW for each combination of BS channel bandwidth and SSB subcarrier spacing (SCS) for mm-wave signals

5G BASE STATION EMF EVALUATION METHOD USING DEDICATED 5G DECODER AND EXTRAPOLATION FACTOR

The method described in this section is based on IEC 62232, in which the radiation pattern and the power per resource element (RE) for the SSB are the same as the traffic channels. Otherwise, an additional extrapolation factor should be considered in the extrapolation to account for the possible difference in the antenna gain and power. In this case, extrapolation factors are applied to project the total radiated power, usually assuming the worst case of power boosting of the UE specific signals.

The maximum exposure from the 5G base station can be determined by measuring the SSB EMF and extrapolate to full bandwidth and consider the maximum gain as compensation factor. The measurements require that the system bandwidth and centre frequency of the target 5G carrier be set. The maximum electric field strength (V m⁻¹), E_{asmt} , is defined by Equation (1).

$$E_{asmt} = E_{SSB(max)} \times \sqrt{F_{extSSB}} = E_{SSB(max)} \times \sqrt{F_{BW} \times F_{PR} \times F_{TDC}} \quad (1)$$

where :

- E_{asmt} is the extrapolated electrical field strength (V m⁻¹);

- $E_{SSB(max)}$ is the total field level (V m⁻¹) per resource element (RE) of the SSB;
- F_{TDC} is the technology duty cycle;
- F_{PR} is the power reduction if the actual maximum approach is used, otherwise it is set to 1;
- F_{BW} is the total number of subcarriers within the carrier bandwidth;
- F_{extSSB} is the extrapolation factor for the SSB.

When the power allocated to any subcarrier is the same, F_{BW} corresponds to the number of resource elements for the system bandwidth of the target base station, the technology duty cycle and a power reduction factor. The extrapolation factor, F_{BW} for each system bandwidth is shown in Table 2 for sub-6GHz and Table 3 for mmWave assuming that all subcarriers are transmitted with the same power level.

Equation (1) shows the 5G EMF evaluation is based on two factors. The first factor is the SSB field level (E_{SSB}), and the second factor is the extrapolation (F_{extSSB}). For the SSB field level, it has to be measured by a dedicated 5G decoder/scanner as per IEC 62232. The total sum of all measured 5G SSB levels are defined in Equation (2). The illustration of the SSB field measurement is shown in Figure 11.

$$E_{SSB(max)} = E_{i,max}^{SSB(RE)} = \max \sqrt{\sum_j (E_{i,j}^{SSB(RE)})^2} \quad (2)$$

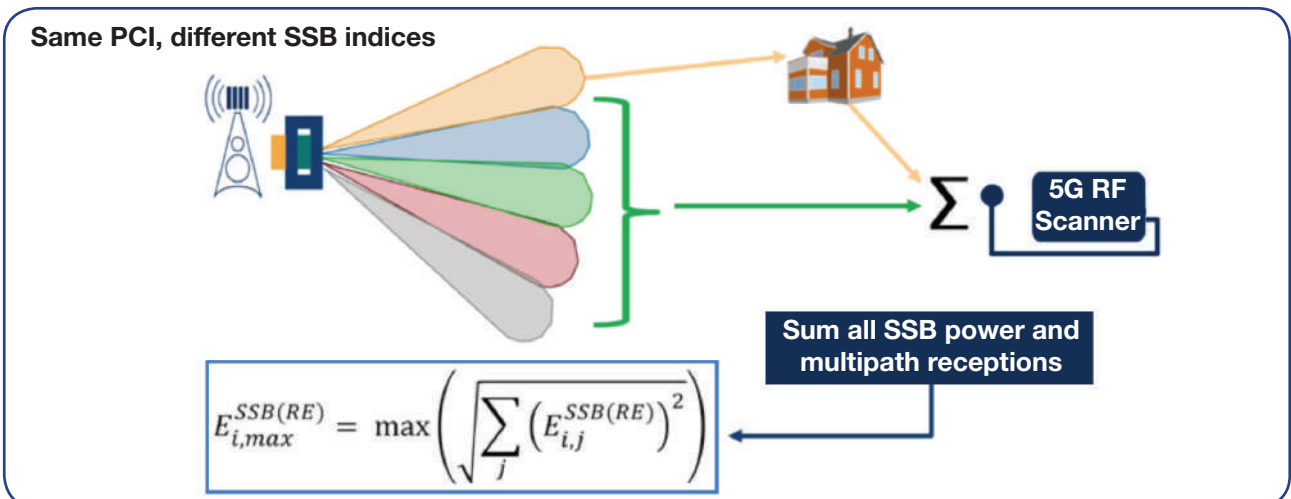


Figure 11: Measurement of the 5G NR base station antenna SSB E-field

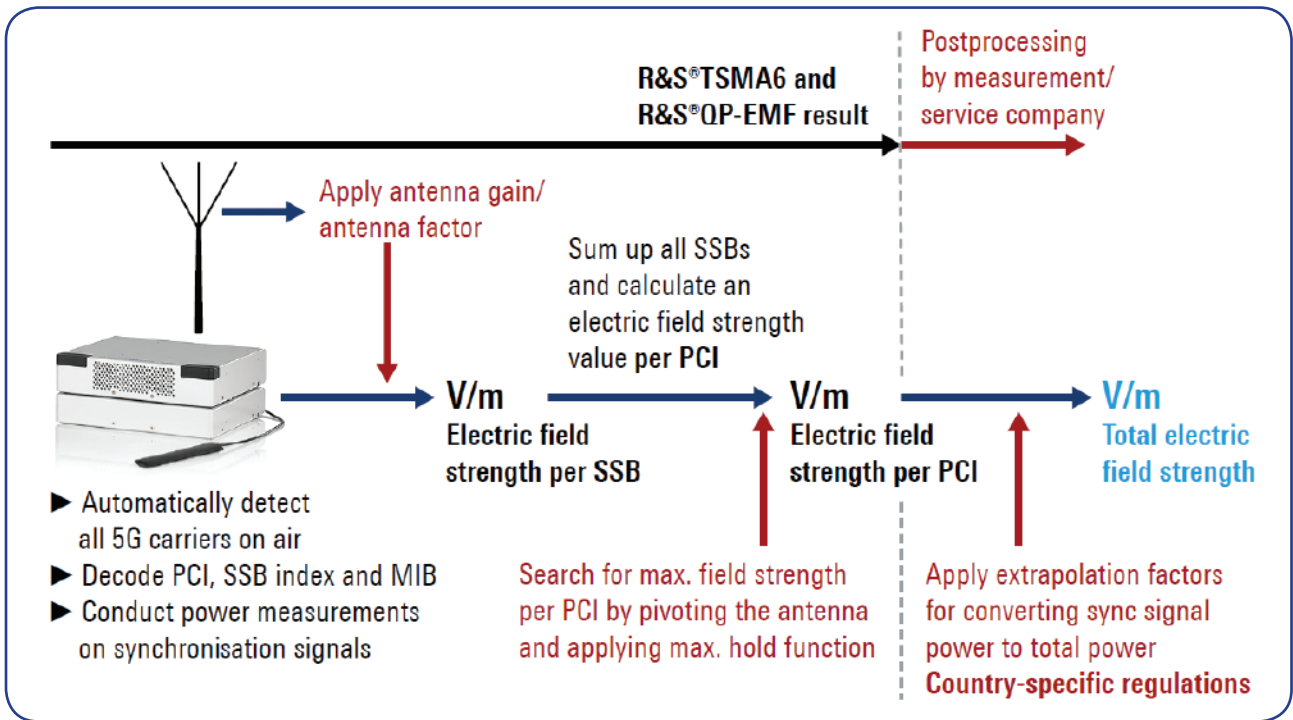


Figure 12: Typical EMF measurement procedure for maximum SSB emission field measurements in 5G

When measuring and subsequently calculating the maximum radiation, worst-case scenarios have to be considered when defining the extrapolation factors. Extrapolation factors such as gain offsets and uplink/downlink relation factors are cell-specific, which require that the measurement system outputs PCI specific EMF values in mV/m, are the baseline for applying the extrapolation factors in a postprocessing routine.

The TSMA6 network scanner is an example of a measurement system that is capable of decoding for maximum emission measurements of 5G. It is able to automatically detect 5G carriers, decode and measure on SSBs and PCIs. By applying the antenna factor and summing up all SSBs per PCI, a unique result is available in mV/m per PCI. As shown in the EMF procedure of Figure 12, maximum emission measurements are considering the worst-case scenario, which requires searching for the

maximum EMF value in a certain area by pivoting the antenna.

The software that supports EMF measurements is QualiPoc Android, and the smartphone or tablet is connected to the TSMA6 measurement receiver via Bluetooth (as shown in Figure 13). The software captures the 5G SSB RSRP value from the receiver and performs all mathematical operations to convert dBm into V/m. It directly outputs power or electric field strength values.

The software features an EMF specific graphical user interface and EMF measurement specific functions to help the user find the electric field strength maximum by providing a max. hold function (by selecting and marking a cell). Figure 14 shows the screenshot of current and maximum electrical field strength in the QualiPoc software.

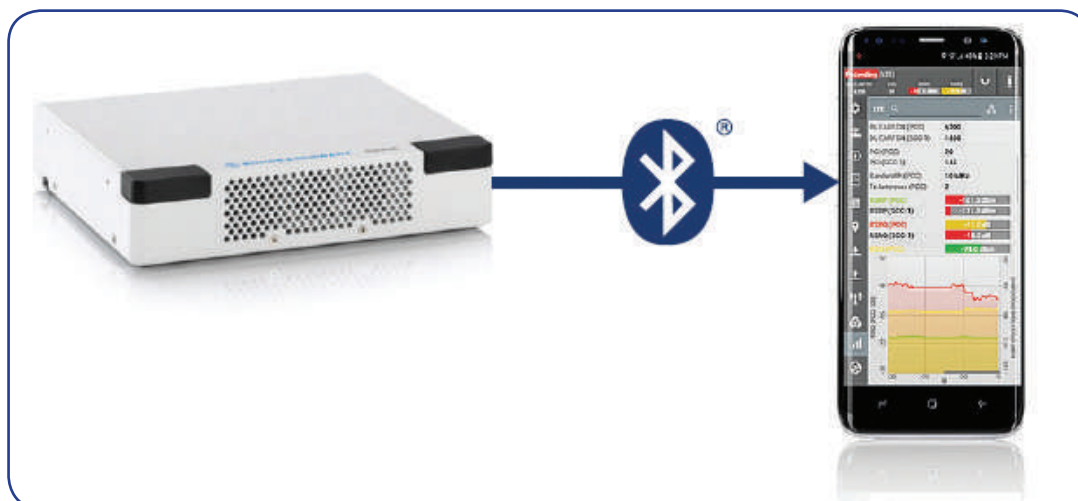


Figure 13: TSMA6 and Android smartphone connected via Bluetooth



Figure 14: QualiPoc screenshots when searching for the maximum electric field strength in mV/m (left) and marking the cell after the maximum is found (right)

CASE STUDY OF 5G EMF MEASUREMENT FROM A 5G TEST SITE

In the third quarter of 2020, Rohde & Schwarz (R&S) and Universiti Teknologi Malaysia (UTM) have conducted the 5G EMF measurement in the UTM Jalan Semarak, Kuala Lumpur campus. The test was conducted in parallel with the 5G co-existence field testing, in which the 5G 3.5GHz outdoor signals are available at the site during that time. The 5G EMF measurements were taken with the 5G scanner antenna facing the two 5G base station antennas installed at the top of the campus building during the field test. Figure 15 shows the location of the 5G base stations with respect to the field testing site.

Figure 16 shows the sample of the walk test for the 5G EMF SSB measurement across UTM Kuala Lumpur campus as well as the screenshot of the maximum electrical strength for one of the 5G antenna during the testing.

The details of the 5G EMF SSB measurement are summarised in Table 4. From here, the total SSB field level (E_{SSB}) which is the first factor of the maximum electric field strength (E_{asmt}) of Equation (1), can then be calculated using Equation (2).

To calculate $E_{SSB(max)}$ from Equation (2);

$$E_{SSB(max)} = \sqrt{E_{300}^2 + E_{301}^2};$$

$$E_{SSB(max)} = \sqrt{0.0278^2 + 0.0375^2};$$

$$E_{SSB(max)} = 0.0467Vm^{-1};$$

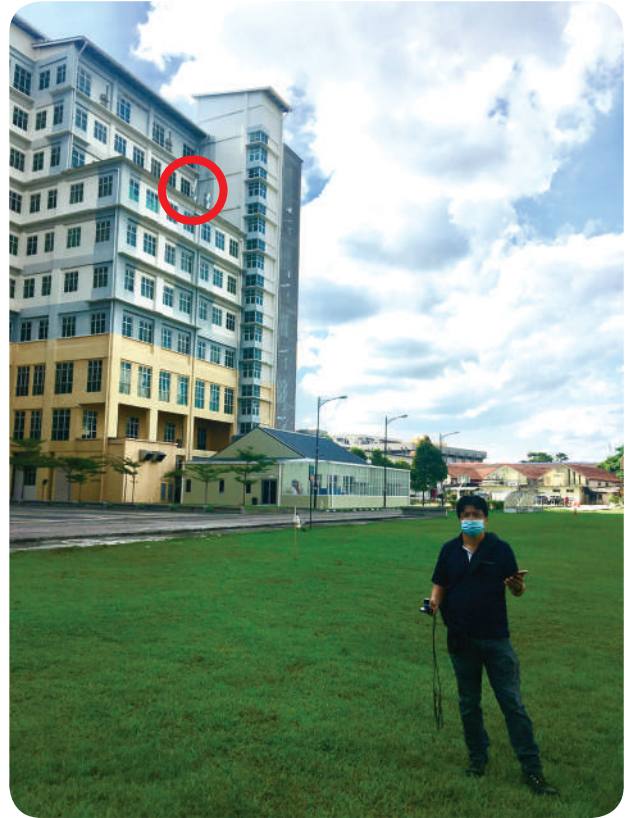


Figure 15: The site of 5G EMF measurement in UTM KL campus

Hence the total measured 5G EMF SSB at the site is $0.0467Vm^{-1}$. To calculate the extrapolated electrical field strength for the 5G signal at the site, the factors for the second factor of Equation (1) can be determined from Table 4. The technology duty cycle F_{TDC} , is equal to 4:1 or 0.8. The power reduction if the actual maximum approach is used F_{PR} is set to 1. The total number of subcarriers within the carrier bandwidth F_{BW} , can be determined from Table 2. Since the 5G signal is 100MHz bandwidth and the subcarrier spacing is 30kHz, F_{BW} is then 3.276. F_{PR} is set at 1 for theoretical maximum exposure. To calculate extrapolated electrical field strength, E_{asmt} from Equation (1);

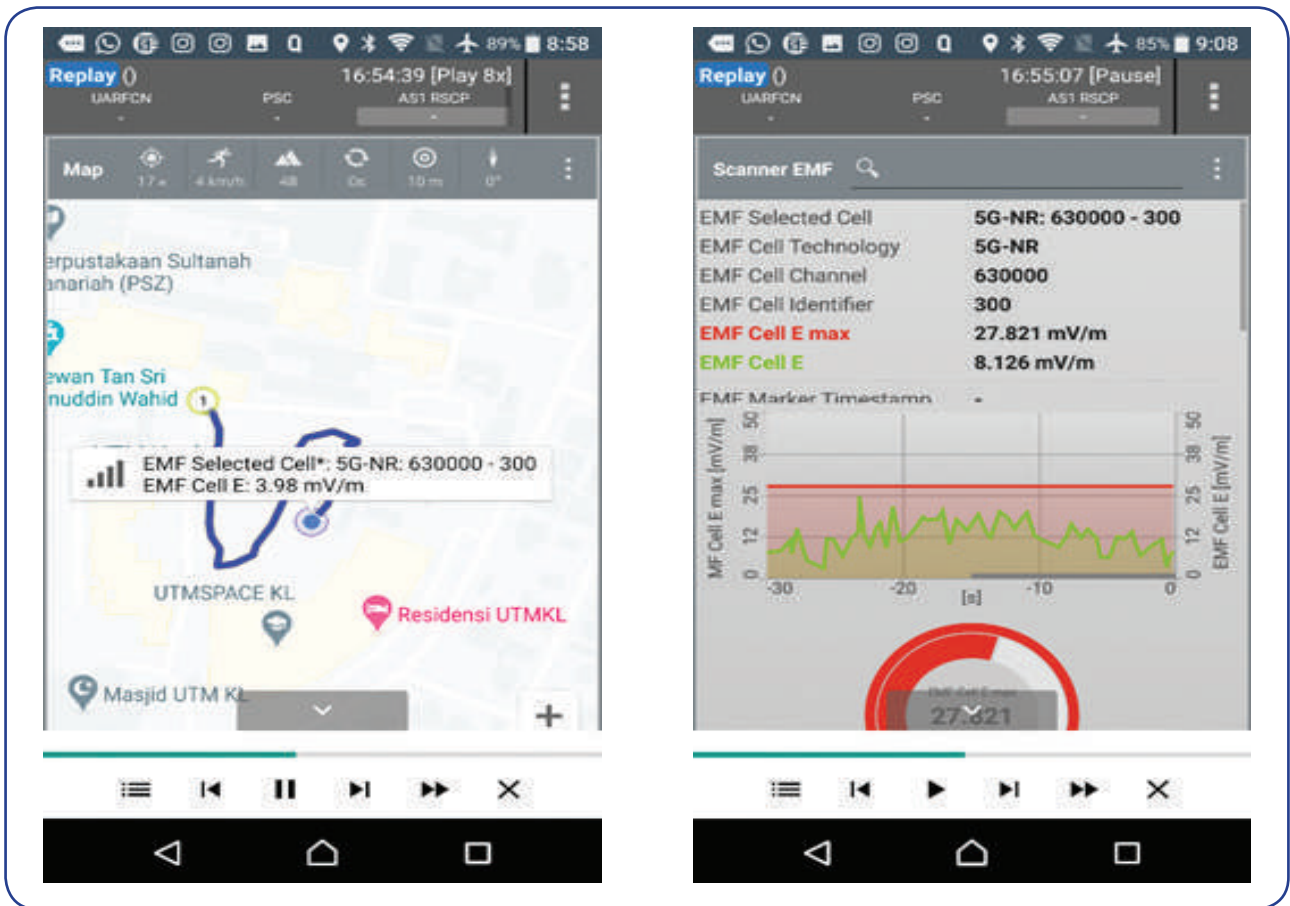


Figure 16: Screenshot of the 5G SSB exposure walk test at UTM campus near the field test area (left) and the maximum SSB exposure level for one of the 5G antenna (right)

Parameter	Value
Latitude	3.17295
Longitude	101.72124
Total number of SSB	2
SSB ID 1	300
SSB ID 2	301
Max EMF SSB 1	0.0278VM-1
Max EMF SSB 2	0.0375VM-1
DL/UL ratio	4:1
Signal BW	100 MHz
Subcarrier Spacing	30 kHz

Table 4: The measurement parameter for the 5G SSB EMF at the test site

$$E_{asmt} = E_{SSB(max)} \times \sqrt{F_{extSSB}} = E_{SSB(max)} \times \sqrt{F_{BW} \times F_{PR} \times F_{TDC}};$$

$$E_{asmt} = E_{SSB(max)} \times \sqrt{F_{extSSB}} = E_{SSB(max)} \times \sqrt{3.276 \times 1 \times 0.8};$$

$$E_{asmt} = 0.0467Vm^{-1} \times 1.62;$$

$$E_{asmt} = 0.076Vm^{-1};$$

Hence, based on the method of determination of 5G EMF exposure from IEC 62232 document, the total extrapolated 5G EMF level at the UTM Kuala Lumpur campus during the 5G field test is $0.076Vm^{-1}$.

SUMMARY

With the impending commercial 5G network roll out in the country, the EMF measurements are essential to prove that the 5G radiation level is below a certain limit. By following the 5G EMF evaluation method by standard body such as IEC 62232, the maximum exposure from 5G base stations can be determined by first measuring the cumulative 5G SSB exposure level, followed by calculating the extrapolation factor as explained in the document. RF scanners are suitable for 5G EMF SSB exposure level measurement as it can decode the SSB signal with high accuracy. [my](#)

MASSIVE CONSIGNMENT OF NON CERTIFIED COMMUNICATION EQUIPMENT SEIZED BY MCMC

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Enforcement Division
MCMC
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MYTV Broadcasting Sdn. Bhd. has been awarded an exclusive right to sell the Set Top Box (HD TV Receiver) using only the MYTV brand by the Government of Malaysia. This device has been certified by SIRIM QAS. In 2016, the Malaysian Communications and Multimedia Commission (MCMC) received a complaint from MYTV Broadcasting Sdn. Bhd. relating to the sales of non-certified communication equipment, that is the Set Top Box through an online platform.

The Complainant surrendered to MCMC one (1) unit of Set Top Box, particularly a MECK brand model MDVB-2615T2 which was purchased by them and suspected to be a non-certified communication equipment. The equipment was purchased through an online platform via a Facebook account known as 'Digital Terrestrial TV Malaysia' which can be accessed via the link <http://www.facebook.com/DttvMyTvMalaysia/>. The Complainant further claimed that there was also another website which can be accessed through the link <http://meck.com.my>, in which it uses the same modus operandi of selling non-certified communication equipment via online platform.

OFFENDING PROVISION

This case had been investigated by MCMC under Communications and Multimedia (Technical Standards) Regulation 2000 namely:

16. (1) No person shall use, offer for sale, sell or have in his possession with a view to sell any communications equipment -
 - (a) which is contrary to the standards;
 - (b) which is not certified as required by these Regulations; or
 - (c) which has been certified but is subsequently altered or modified and no longer complies with the standards.

INVESTIGATION

The investigation was commenced by verifying the certification status of the communication equipment

purchased by the Complainant. It was later confirmed by SIRIM QAS that the communication equipment was not certified as required by the Regulations. Subsequently, the investigation proceeded to trace the owner and the administrator of the 'Digital Terrestrial TV Malaysia' Facebook account, as well as the website, <http://meck.com.my>.

Based on the information gathered, MCMC was able to collate all contact numbers in the Facebook account which were being used by the suspect with the intent to sell the non-certified communication equipment. Upon further verification, the registered owners of the said telephone numbers were then successfully identified. As for the website <http://meck.com.my>, MCMC opted for the Open Source Intelligence Tool via the who.is portal to verify the website registrant information, which was later identified as Meck Marketing Sdn. Bhd. It was suspected that said company is the main supplier of the non-certified communication equipment.

A series of surveillance operations were conducted and MCMC managed to obtain vital information regarding Meck Marketing Sdn. Bhd.. It was discovered that the company was expecting a massive consignment of new stocks of communication equipment to be delivered to their premises in a couple of days. Further to the surveillance conducted, MCMC also discovered two other premises, UA Electronic and Services in Pasir Gudang and Red Heart Mobile in Kulaijaya owned by individual sellers, selling the same non-certified communication equipment.

Acting on search warrants issued by the Johor Bahru Magistrate's Court and with the assistance from the Royal Malaysia Police, a simultaneous raid was carried out at three (3) separate locations. As a result, MCMC successfully seized 4,756 units of the Set Top Box (HD TV Receiver) DVB-T2 brand MECK model MDVB-2615T2 worth a total of RM1.18 million from the three (3) aforementioned premises. The confiscated units in Johor Bahru were the biggest seizure made by MCMC's Enforcement Division since its establishment.



Confiscated items from this case



To ensure the thoroughness of the investigation, each of the confiscated communication equipment was marked according to an 8-digit serial number and recorded in a search list inventory. The team worked tirelessly for three (3) days to complete the marking process as a delay in protecting, preserving or gathering evidence may result in it being contaminated or lost.

Based on the concept of sampling, some of the communication equipment were sent to SIRIM QAS for the process of Physical Inspection, Partial Testing and Product Verification. The outcome of the inspection and testing by SIRIM QAS proved that all samples of the communication equipment failed technical tests based on the Standard provided in the MCMC MTSFB TC T004: 2013 - Specification for Digital Terrestrial Television Broadcast Service Receiver. Therefore, all the seized communication equipment were officially classified as non-certified and contrary to the Standard.

Finally, a total of 21 witnesses, which included all the directors of Meck Marketing Sdn Bhd, and the resellers, were called and their statements were recorded to assist in the investigation.

FINDING AND ACTION

During the course of information gathering, evidence also pointed to the fact that Meck Marketing Sdn. Bhd. was the main supplier and importer of the non-certified communication equipment, Set Top Box (HD TV Receiver) DVB-T2 brand MECK model MDVB-2615T2.

On the advice and instruction of the Deputy Public Prosecutor,

- (a) Meck Marketing Sdn. Bhd and their three (3) directors as well as their retailer, the owner of UA Electronic and Services, were issued compounds amounting to RM105,000.00 for the offence under Regulation 16(1)(b) of the Communications and Multimedia (Technical Standards) Regulations 2000. The compounds were paid and all the non-certified communication equipment confiscated have been disposed off by MCMC.
- (b) Red Heart Mobile who is the owner and the administrator of the Facebook account '*Digital Terrestrial TV Malaysia*' was issued with a warning letter as there was insufficient evidence to link the suspect to the said offence. There was also no non-certified communication equipment found on the premises during the raid. [smv](#)

SCOREBOARD



POSTAL TRAFFIC DOMESTIC PARCELS

MILLION



2020 : 0.8
2019 : 0.9
2018 : 0.9
2017 : 1.0
2016 : 0.9
2015 : 0.8

Postal and Courier

POSTAL TRAFFIC DOMESTIC LETTERS

MILLION



2020 : 456.9
2019 : 596.5
2018 : 672.3
2017 : 738.1
2016 : 808.2
2015 : 851.3

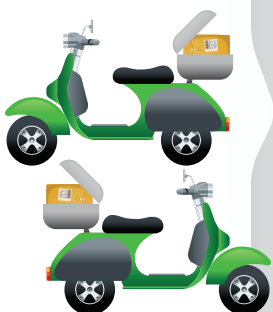
NUMBER OF POST OFFICES



2020 : 810
2019 : 896
2018 : 914
2017 : 921
2016 : 927
2015 : 930

COURIER TRAFFIC DOMESTIC DOCUMENTS

MILLION



2020 : 107.3
2019 : 91.6
2018 : 87.3
2017 : 52.8
2016 : 47.2
2015 : 33.2

NUMBER OF COURIER LICENCES



2020 : 106
2019 : 104
2018 : 119
2017 : 128
2016 : 112
2015 : 88

COURIER TRAFFIC DOMESTIC PARCELS



2020 : 303.2
2019 : 120.3
2018 : 85.7
2017 : 34.3
2016 : 23.7
2015 : 18.6



Communications and Multimedia

PENETRATION RATES: MOBILE - CELLULAR PER 100 INHABITANTS



2020 : 133.6%
2019 : 135.4%
2018 : 130.2%
2017 : 131.2%
2016 : 139.9%
2015 : 143.8%

PENETRATION RATES: MOBILE-BROADBAND PER 100 INHABITANTS



2020 : 118.7%
2019 : 123.7%

PENETRATION RATES: PAY TV PER 100 HOUSEHOLDS

BILLION



2020 : 89.0%
2019 : 86.3%
2018 : 87.6%
2017 : 83.6%
2016 : 78.6%
2015 : 73.7%

PENETRATION RATES: FIXED BROADBAND PER 100 PREMISES



2020 : 37.2%
2019 : 32.8%



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