Bangi Management Review

BECOMING A DIGITAL NATION

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The Digital Nature
Imense data coming out of the life science field in particular health care and agriculture demands digitalization. Algorithms, computational modeling, and big data analytics are but a neccessity to modern day life scientists.

EDITORIAL NOTE

Malaysia is moving into a digitally advanced era to become a digital nation. As a small open economy, Malaysia's competitiveness is no longer sustainable if limited to its traditional physical factor endowments such as land, capital and labour. Malaysia can only continue to progress in its development path by its penchant for unlocking ideas and innovation in the digital economy as well as ensuring that growth in the digital economy is broad-based and sustainable. Without any doubt, Malaysia's transition to a high-income and developed economy lies in the potential of the digital economy as the new driver of development especially with the opportunities driven by high-tech sectors. Beyond the physical infrastructure and related connectivity, Malaysia needs to make sure its workforce is digitally competent, innovative and well-prepared to thrive in the digital economy. New emerging technologies developed by innovative knowledge-workers are among the key ingredients of a smart nation. Moreover, knowledge workers in smart industries and digital entrepreneurship are a much-needed necessity through which Malaysia can spur economic growth and uplift a nation to rank amongst the top developed nations.

The path towards a digital nation, however, is strewn with many issues and challenges that need to be addressed by all stakeholders. These issues and challenges are not limited to technologies and workforce only but the whole ecosystem that contributes in becoming a digital nation. In this fourth issue, contributors talk about the impact of digitalisation on healthcare providers such as the establishment of a digital teaching hospital and digital anatomy. Some concerns are raised by several authors with regard to the dangers lurking the society as a result of advanced digital technology. It includes building a safer world for connected children, digital image forgery, and cyber defamation. In becoming a digital nation, social aspect must not be neglected. The role of education, state government and corporate sectors are emphasized in this issue. Most interesting, we also sought the view of the Ministry of Communications and Multimedia Malaysia (MCMM) on the efforts and initiatives taken by the government in building Malaysia as a digital nation.

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BECOMING A DIGITAL NATION
By Syed Uzair Othman

The idea of becoming a digital nation was not really a recent thing. It was first conceptualised in 1996 in the form of Multimedia Super Corridor (MSC) to fulfil our dreams to be the Silicon Valley of Southeast Asia. MSC was supposedly the catalyst for us to join the 'information society' that would lead us to the 'knowledge economy' as the new engine of economic growth. More than 20 years later, Malaysia should already be in the pole position in the digital race, but, alas, Malaysia seems to slip behind instead.

In order to explore and understand the path that Malaysia is taking towards becoming a digital nation, we sought the government's perspective through an interview with **Mrs Nur Izyani Zakaria**, Principal Assistant Secretary, Strategic Planning Division (Data Management), Ministry of Communications and Multimedia Malaysia (MCMM) in April 2019. Nur Izyani has been in the Ministry of Communications and Multimedia Malaysia since 2017 dealing with open data, big data and all other ICT matters. Prior to her work at MCMM, she was with the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU), Prime Minister's Department for close to 8 years. She gained most of her experience and knowledge on digital technology through the involvement of MAMPU as the leading agency in spearheading government digital initiatives.

Unlike the Fourth Industrial Revolution (4IR) or Industry 4.0 which has a clearer meaning to the people, a digital nation is less so in what it entails. In the perspective of government as the policy maker, what exactly do you mean when you say to turn Malaysia into a digital nation?

Industry 4.0 is more specific to the development of programmes and initiatives using emerging technologies such as Artificial Intelligence (AI), Internet of Things (IoT), Big Data Analytics and many more to the manufacturing industry that support the whole notion of the digital nation. With the recent Fourth Industrial Revolution adoption globally, the Malaysian Government has also been keeping pace with the application of these emerging technologies in order to enhance the quality of service delivery to the people. At the Ministry level, we have started for quite some time but gaining a faster track and more focus since 2014. The spotlight now is more on data management. In order to propel the nation forward into becoming a digital nation, we have to start at the source, namely the data. Data has become the new currency now where it has been used vastly in digital transactions and will continue so in many other transactions in the future. So the policies and programmes start with data management.

In 2018, with the new government in place, a new strategy and direction is developed to launch Malaysia into a digital nation. An announcement was made in 2018 by the new government that the Internet would be treated as the basic utility for all citizens just like electricity and water. In other words, all citizens should have the rights to Internet access similar to their rights to other basic utilities such as electricity and water.

The development of this digital nation framework does not carry a specific timeline given the rapid progress of digital technology. In this framework, three main components are established as the main focus - the development of digital society, digital government and the digital economy. The main building block of a digital society is in the creation of digital natives. Hence, the policy is geared towards increasing the digital literacy of citizens by harmonising the generational gaps between the digital immigrants, digital adopters and the digital natives. We start to expand the Internet capability to the rural areas and to increase the societal adaptation to everything digital through e-wallet, Internet of Things (IoT) and so on. We also begin to develop smart cities, for starters in Putrajaya, Cyberjaya, Kuala Lumpur and Selangor.

As for the digital government, we create a digital ecosystem that is conducive to the society including digital platforms that provide convenient services to the society. Big Data Analytics is being utilised by ministries and government agencies to develop systems and initiative that could enhance society's standard of living. For example, the Royal Police of Malaysia uses the existing data and develops analytics for crime preventions; Road Transport Department utilises the traffic data for more accurate traffic prediction for better traffic control and management; the Ministry of Domestic Trade and Consumer Affairs takes advantage of data analytics to initiate price watch action and control mechanism. In short, the government is managing the data to create many initiatives to give back to society.

The last component is digital economy where many initiatives, especially under the Ministry of Trade and Industry (MITI) have been implemented in line with 4IR. While 4IR is focusing more on innovations using the disruptive tools such as AI, Robotics and IoT in the manufacturing sector, we are also looking for technology drivers for other industrial sectors like agriculture, transportation and fisheries. MCMM plans to move forward in championing digital transformation in a more structured and holistic way including strategic collaborations with its agencies as well as other public and private agencies.

When we talk about this disruptive technology such as AI and Robotic, there is a concern that such technology transfer may displace the human worker. How does the government respond to this issue?

I think there is a misconception in this issue. The technology is there to assist the workers instead of replacing them. The human workforce is still much needed in many critical areas especially those with cognitive dimension. Having said that, under the umbrella of a digital nation, the workforce needs to be upgraded through reskilling and upskilling especially from performing menial jobs that can be accomplished by using technology. More focus is being directed to talent management recently as to prepare our workforce with upgraded knowledge and skills needed to support the development of a digital nation. Data science is the new field of expertise that we need to master and the Ministry is aspired to cultivate more data professionals that will drive Malaysia towards the desired state.

Whose responsibilities exactly are reskilling and upskilling of our workforce fall onto?

It should be a collective effort from all the stakeholders including the ministries and industries. Education is an ideal starting point from the primary, secondary and up to tertiary education. Once they enter the workforce market, the Ministry of Human Resources can start playing its role. The Ministry of Education (MOE) needs to initiate this workforce uplifting process at the early education stage as well as advocating this mind shift to specific interest groups. MOE, however, has already developed the blueprint towards this end such as the new focus on Technical and Vocational Education and Training (TVET). Maybe we should also start to introduce subject such as AI and robotics in school. Look at the example of China. They made a very bold decision to move forward and acted accordingly. Now, they even have textbooks on AI for secondary schools.

How committed is the government in this drive forward to be a digital nation, irrespective of the government changes in the future?

Our journey to become a digital nation is not only by ourselves alone. We also have to see and follow the global technological journey. When we started the MSC, we watched the growth of the Silicon Valley and we did not want to be left behind. The earlier initiatives are still ongoing but along the way, the priorities may have changed, somewhat. At times, even though the focus remains but maybe it slows down a little. Now, when the global digital pace starts to pick up rapidly, we also pick up our pace to develop the capacity and capability in digital technology. Sometimes, certain technological initiatives are slow in showing visible impacts. MSC needs time to be developed and to reach maturity together with the development of our own expertise. We

are not lagging behind. Even the Industry 4.0 was first mentioned by the German government as recent as 2013, if I am not mistaken, and popularised only since 2015.

Do we benchmark ourselves against other countries or look at best practices from other countries?

We did benchmark our digital programmes with countries like Estonia, United Kingdom, United States, South Korea, and to a certain China. Obviously, we also need to adapt those best practises based on our own legal, socio-political and cultural environment. Estonia, for example, is comparatively a small country and thus, most probably easier for her to face the challenges of becoming a digital nation. In short, we benchmark with the international standard without jeopardising the national interest. We are also very active in engaging with strategic partners and

onto the digital platform or being digitalised for further popularisation.

Much more significant, I believe, is the political environment. Digital maturity requires political maturity. A divided nation politically cannot achieve this lofty target. Political stability and a strong political will are imperative to digitalise the nation. A digital nation requires all the stakeholders to have a shared value and be on the same page. Nevertheless, there seem to be a consensus among all the political parties, both government and opposition, as far as our objective and direction to be a digital nation. The problems are more on the issues of data leakages, uncontrolled data inflow and outflow, and breach of data security.

How serious is the issue of cybersecurity in Malaysia?

So far the issue of cybersecurity is at a manageable level. It is far from being a national security issue but we are not resting on our laurels. You see, the entry of emerging technology like cloud computing and IoT comes with certain risks. We need to open our borders to the inflow of global information for our own progress but at the same time, this borderless environment also exposes our country to the cybersecurity risk. Hence, we need to diligently manage and supervise this inflow and outflow of information especially through the existing agency like the MCMC, and the law per the Malaysia Communications and Multimedia Act 1998, as well as other relevant laws and guidelines. We are also moving forward to improve our legal measures so that our cybersecurity parameters are sufficient to protect the nation's interest.

What do you think of the response from the industry in terms of cooperation and collaboration with the government in promoting the digitalisation programmes?

The industry moves a lot faster than the government. We need sufficient time to develop a relevant policy to any new technology or innovation but that fact should not hinder the industry or the academia from moving ahead. We definitely do not hinder the industries to prosper with any technological development as long as they operate within the ambits of the governing laws over the matter. We even encourage those who want to bring 5G technology, cloud computing, or any advanced technology. MCMC and MDEC are collaborating well with the industry on this. We launched a showcase on the fifth-generation technology or 5G recently with collaboration and cooperation of private sectors who are fully aware of its tremendous potential. We are also trying to bring digital giants like Amazon, Facebook, Google, and Microsoft to invest in Malaysia. We provide various incentives under MITI and The Malaysian Investment Development Authority (MIDA) for companies with MSC status.

international counterparts through our agencies namely the Malaysia Digital Economy Corporation (MDEC), Malaysia Communications and Multimedia Commission (MCMC), Cybersecurity Malaysia (CSM) and many more. These engagements are vital in ensuring our industries are always moving forward with the latest technology and initiatives.

Culture seems to be left out or seldom being mentioned in the discussion about a digital nation. How do you see the cultural and political environment in relation to this digitalisation effort?

I think there will be a minimal impact. In fact, culture can be adapted to cultivate digital adoption and similarly, digital technology can be the driver to nurture positive culture. As far as the popular culture in the form of performing arts, for example, it can move from the traditional platform

Much of the digital economy continues to be dominated by large firms, what about the Small and Medium Enterprises (SMEs) as the engine of growth for the digital nation?

We do not focus only on big companies; there are also many programmes for SMEs and business start-ups. Under MDEC, we even provide handholding support to these start-ups through many programmes like eUsahawan and eRezeki targeting youth and the Bottom 40 (B40) citizens respectively to promote digital entrepreneurship as well as boosting low-income households through digital income opportunities. While MDEC, provides training, education and digital platforms, the Ministry of Entrepreneur Development (MED) introduces many more programmes and initiatives together with various incentives for SMEs. MED is the main ministry that provides the business ecosystem for all SMEs whilst MDEC focuses on digital or online businesses. We collaborate among the ministries to promote and nurture the digital businesses and the digitalisation of businesses.

What are the main issues and challenges for your ministry in this journey to transform Malaysia into a digital nation?

The main challenge in the digitalisation process is to consolidate all the initiatives and programmes for better strategic management and to standardise the rules, procedures and guidelines for a more structured and effective approach. Sometimes, everybody is doing the same thing for different sectors under each responsibility. I think the approach towards digitalisation needs to be more structured. For example, if we are dealing with AI or cloud computing, then we need the policy to drive the industry towards its applications with proper guidelines on how to go about it.

Secondly, we need to build capacity, especially in developing human capital. We need substantial numbers of data scientists and data engineers, for example. We need to start robotics and programming education in schools. Actually, we have started with computational thinking curriculum in schools including programming and coding, and basic knowledge on AI and robotics since last few years but the efforts have to be holistic, constant and consistent as the impact can only be seen and felt at least 10 years down the road.

We must also ensure digitalisation benefits all walks of life and not only the privileged ones. Hence, digital inclusion is another element that we need to focus on. In order to overcome these challenges, all relevant parties must put a collective effort and play their role accordingly to ensure the strategies planned are executed efficiently.

The government policies sometimes are claimed to reign in or hinder creative and innovative thinking among the practitioners. Any suggestion for the future development of policies to be more responsive to the initiatives from the industry or academia?

Policy development usually is based on feedback from the industry, academia and the people. Only then we would know the requirements and the constraints on the related matter of interest. We normally will engage all the stakeholders for feedback to ensure that the policy will not restrict any productive or creative pursuit of technology by the practitioners as well as providing overarching guidelines to use the technology without breaking any rules. The monitoring mechanism of the policy is never meant to hinder any innovation or to restrict the use of technology but to ensure compliance with rules and regulations of the country. The policies are also reviewed and amended from time to time so as to stay relevant to the current situation and circumstances.

What are your concluding remarks on our aspirations for Malaysia to be a digital nation?

With the aspiration to be a digital nation, we are looking at two major strategies - digital adoptions and digital tech entrepreneurs - as the drivers for the development of digital society, digital government and digital economy. In order to achieve this national aspiration, we need to execute the strategies identified in the building blocks consisted of proper infrastructure and platforms, talent development, legislation and policy monitoring mechanism, and cybersecurity vigilance to safeguard our environment and digital ecosystem.

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DIGITAL TEACHING HOSPITAL: IS IT FEASIBLE?

By Mohd Hasni Jaafar

Teaching hospitals generally treat all sorts of patients in particular tertiary cases due to the presence of specialist from various medical disciplines with advanced laboratory diagnostic analysis and treatment methods.

In addition, the institute also caters for hundreds of undergraduate and postgraduate medical students for their education and training at one time. These pose a great challenge for more complex management, basically on the human aspect, energy and resources of the hospital, and the huge amount of wastes produced.

The National Industry 4.0 promotes innovation, creativity and competitiveness in embracing the intensification of the digital revolution including healthcare sectors. The aims for the healthcare digitalisation are to improve its performance, optimising its management costs, and raising awareness among its clients and stakeholders.

Patient care and safety are two important objectives of any healthcare in the world. Certain difficult patients, such as from neonate or children's wards, or psychiatric wards, are not able to give the correct answer to whatever questions from the healthcare workers.

Digital sensor or the Internet of Things may help the healthcare workers to determine either they have taken their medicine correctly, or received the correct medicine at the correct time, or haven't developed any adverse effects based on changes on the vital signs, and many others. The well-managed patient normally required lesser man hours to handle those cases. The hospital may consider allocating less budget for overtime claim or passive on-call roster.

For an unconscious patient who undergoes a procedure, the digital sensor will ensure it is the correct patient, the correct limb and the correct side of the body will be operated. All disposal and non-disposal equipment should be tagged or count with a digital sensor to prevent any left-over of gauze, needle or surgical scalpel in the abdomen. This will reduce unnecessary medico-legal cases and claims.

Food that is served to patients and healthcare on-call should be safe and not contaminated with common germs such as E.coli or Salmonella typi, the two commonest bacteria for food poisoning in Malaysia. The sensor application should focus on critical points as identified through Hazard Analysis Critical Control Point (HACCP) certificate. It covers from raw material until the serving of food to patients. Again, the digitalisation of food production will further reduce the length of stay, increase the food safety awareness among food handlers in the hospital, and enhance the image of the institute.

Pertaining to the hospital environment, the sanitation, floors, wards, and toilets need to be cleaned regularly by using specific methods and correct detergent. The specific sensor should able to detect whether the operator used the correct

mob for toilets and for ward's floor, which should be colour coded and well separated. Certain sensors are also able to detect the presence of common germs, especially at the door handle, sinks, and light switches.

The teaching hospital is known to produce more clinical waste compared to other smaller medical institutes. Over spillage of waste from the yellow bin, not enough yellow bin, inappropriate place of the yellow bin are common non-conformance reports obtained during auditing exercises.

Many hospitals and commercial centre have applied digital sensor for smaller bins as one of their mitigation methods. From a control centre, those bins will be monitored and emptied accordingly. The advantages of these include less sharp or needle injury among healthcare workers and medical students.

Another type of waste is wastewater or effluent that derived from all discharged from the laboratory, wards, operating rooms, and hostels. A dedicated digital sensor is able to detect any content of heavy metals, solvents, hydrocarbon and others, according to effluent standard by the Department of Environment, Malaysia. Any violation, the effluent system able to be stopped and remedial action should take place as soon as possible to prevent contamination of affected nearby river or surface water.

All waste from the student hostel should be handled well by applying some kind of digital sensor particularly in the segregation of their domestic wastes. They will be encouraged to separate plastic from other recyclable wastes like food waste, paper, aluminium can, and glass. The whole level of the hospital is also being provided with such digital bin to encourage caregiver who is attending patients to segregate their wastes. Indirectly, this will create awareness about waste segregation among patients and their caregivers, students and all healthcare workers.

The digitalisation provides a real-time tracking system for a treating medical officer to know where the location and status of the patient's specimen. This will reduce the issues of wrong labelling of the specimen, loss of specimens, specimens do not reach the laboratory within time, and the cold-chain compliant during the transportation. It is also applied to organ transplant and cadavers.

Amenities bills and water quality are big problems at any teaching hospital. For security and safety purposes, each corner at the hospital needs to be bright enough. But at a certain time, there will be nobody there. In Japan, they have a digital sensor that detects the presence of people, which caused the particular line of lights on.

Water quality is also another issue. We found in a study that the chlorine residue was lesser than 0.2mg/L when it reached at a certain hospital, particularly those 20km away from the treatment water plant in Selangor.

The digital sensor will ensure the chlorine level is enough especially for hand washing or scrubbing in the wards or operating rooms. This will reduce the incidence of wound breakdown and surgical site infection in the hospital. Indirectly, this will improve on the surgical procedure performance and length of bed occupancy will be reduced further because of fewer complications.

For healthcare workers and students, they are encouraged to exercise at least 10000 steps per day and take the stairs rather than the elevator or escalator. Digital stairs produce various types of effects such as animal sounds, the colour of the rainbow, the sound of the piano, and other entertainment sound or light effects than motivate people including caregiver and able patients to use stairs. Less elevator or escalator, less electrical bills.

Every year, millions of Ringgit were spent for medico-legal cases, over time and passive on-call duty, electrical bill, clinical waste management, and others. Digitalisation and simple sensor will further reduce the money spent, and in the long term, more money can be spare for other purposes. Every year the operating budget will be optimised and used wisely without any unnecessary waste.

More advanced diagnostic equipment and facilities at the clinics, wards and operating rooms may be installed in the future. Upgrading of student facilities like discussion rooms, and conducive hostel will attract more students, particularly from overseas to come here for their medical education up to the doctor of philosophy level.

Last but not least, all patients and their caregiver, students, and lecturers, and healthcare workers in the hospital will have better awareness about maintaining the cleanliness of the hospital environment, attention on the food safety, motivation to waste recycle and clinical waste good disposal practice, fewer amenities bills, and others.

These are pushing factors for the teaching hospital to excel further in patient care and safety, and the education of medical students as the next future medical practitioner with the competency to serve in the coming digital world.

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DIGITAL IMAGE FORGERY DETECTION: DETERMINING INDIVIDUAL IMAGE AUTHENTICITY

By Hadi Affendy Dahlan

Malaysia has started to become a regional ICT hub after the launching of MSC in 1996. Due to this, our nation has adopted the digital approach in a lot of other fields such as in industry, agriculture, medicine, banking, business, marketing, news, research, and even education. However, as Malaysia becoming digitally competence, one must remember that any tools and/or systems created for good can also be used for evil. As technology becomes more advanced, so does the cybercriminals who vandalize, steal and corrupted important information and resources for their own selfish purpose. Many of these crimes can be prevented by improving one's awareness, but in some cases, technology is needed for protection from a tricky situation. One such case is the facial or individual image forgery or tampering. Such as altering an original image by modifying or adding a specific individual in that image for the purpose of creating false information or slandering.

"A picture is worth a thousand words" and "Seeing is believing" are two known idioms used to prove that people are easily convinced with visual clues more than verbal clues, but this can be a major problem if it leads to misinterpretation and/or false accusation. With the current image editing software available for everyone such as Photoshop, CorelDraw, and GIMP, the cybercriminals can now easily tamper a digital image with false information. In January and February 2019, a total of 1039 fraud incidents have been reported in Malaysia Computer Emergency Response Team (MyCERT) [1], which consist of online fraud, email phishing, and user content issues. Online frauds will continue to grow in the future and will be the most reported incidents in our constituency. The impact of fake individual images in Malaysia can become a big threat to our country if the problem is not managed properly.
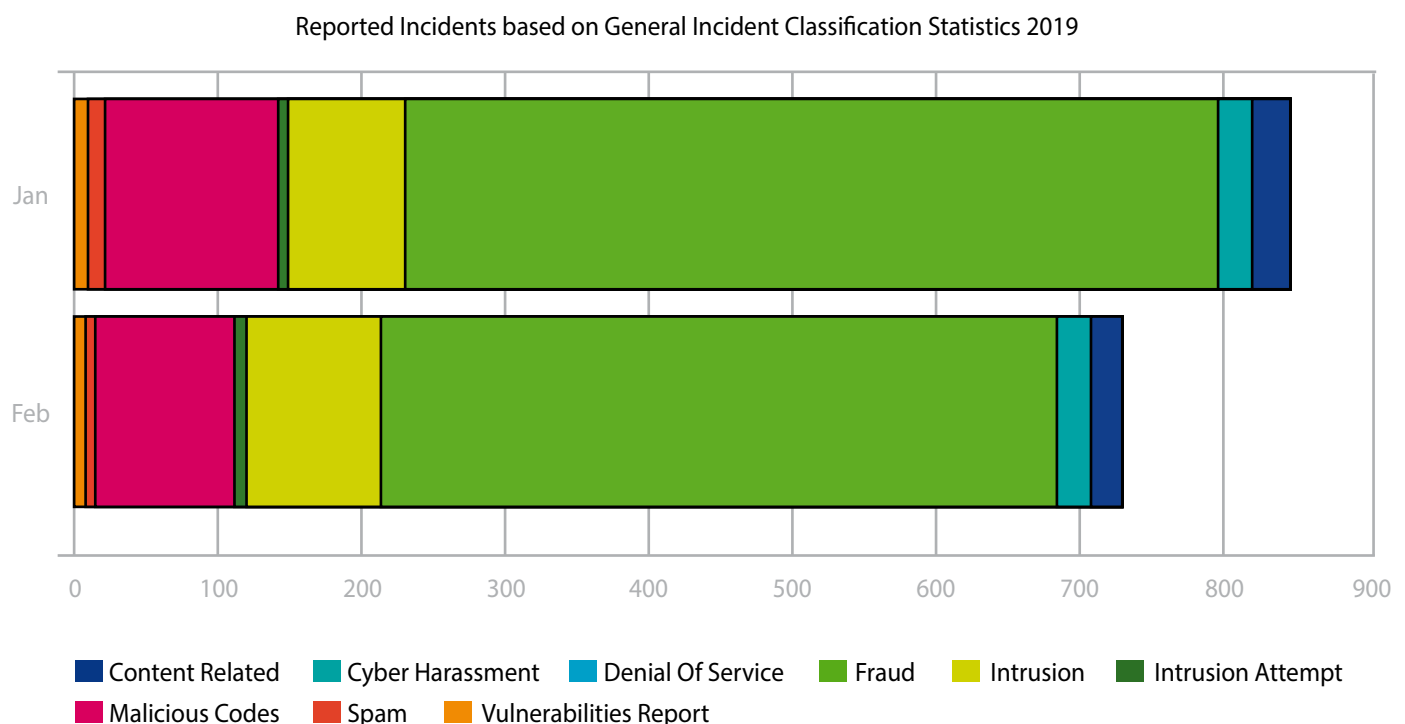

Reported Incidents based on General Incident Classification Statistics 2019

Highcharts.com

Figure 1: MyCERT Incident Statistics for 2019
The picture was taken from MyCERT (2019)

There are two common approaches being used by the expert in the digital image forensic to detect a false image; they are an active approach and passive (or blind) approach. Active approaches involve embedding a digital signature or watermark inside the original image to make it authentic and later be used to prove the image originality. The downside for this approach is that the signature or watermark can only be embedded by an authorized person processing the image, which is quite impractical. Moreover, most images are not embedded with digital signature or watermark. Meanwhile, for passive approaches, the source image is not available. Therefore, to detect the tampering operation that has been done on an image, the digital image fundamental statistical properties will be the one being examined, since any tampering on a digital image will result in its properties becoming inconsistent. They are four general types of image alteration:

1) **Copy-move** in which a specific part of the image is duplicated within the same image;

2) **Image splicing** (or generally cut and paste) is when a part of the image was copied from another image;

3) **Resampling** is when the tampered part of the image is being resized by either reducing or increasing its number of pixels; and

4) **Retouching** which is repainting some parts of the image to recover or remove it. This type of alteration is based on copy-move method, but the difference is it uses different patches from different locations of the image instead of using the same part of the image continuously.

There are multiple methods of forgery detection that have been introduced by the digital image forensics to solve the passive digital image forgery problem (e.g. physics-based, and geometric-based techniques), but one of the most commonly used methods is the pixel-based detection. Two main reasons this method is highly used. First, the most information tampering is done at the pixel level. Second, the method does not require any prior information about the type of tampering. This technique core method is on finding statistical irregularities that occurred in image pixels during the tampering. However, with the current advancement in technology, researchers even able to create a fake video acting of an individual and making it looks realistic using a system they called Deepfake (Afchar, Darius, et al., 2018). Even though pixel-based techniques are the simplest and robust approach proposed by the digital image forensic researchers, it is still would not be enough to fight against attackers that can work on developing algorithms that could deceive this detection method by hiding the traces of tampering efficiently. Thus, an alternative method needs to counteract this attack.

Figure 3: The image of an elderly before (left) and after (right) the retouching process.
The image was taken from Photo Retouching (2019)

Figure 3: The fake image (left) done using the 'Deepfake' technology compare to the real image (right).
The image was taken from Leskin (2019)

Focusing on the digital image forgeries regarding the specific individual (e.g. changing the face of an individual in the image into someone else using image splicing), the pixel-based technique can be combined with another method to countering the ones that manage to hide the tampering traces. In this article, the author intends to solve this type of case using the forensic techniques combine with the pattern recognition technique (e.g. face recognition). It was mentioned that the forensic passive detection approach does not use any source image, but when the pixel-based detection fails to detect the perfect tampering done on the individual face in the digital image, a source image must be available to confirm (or compare) whether the individual in the image is fake or real by using pattern recognition method. The recognition part act as the

second layer of defence for detecting individual image forgeries. There are several suggestions on how to solve specific individual type forgeries problems when pixel-based detection fail:

1) ***Checking the facial structure of the individual whether it matches with the current individual.*** If the attacker retouches the face image, making the person looks younger (or older – see Figure 2), the face age recognition/estimation method can be used to compare the image with the current facial age of that person. One method is to use global feature detection method such as the Active Appearance Model (AAM) to get the key points of the target person's facial structure in the fake image for later detection (and also for comparison between the fake and the original).

2) ***Checking the body and head shape of the individual whether it is consistent with the original individual.*** When the attacker image splices another person's face on a different body in the image (see Figure 3), the whole body of the fake person will be different when compared with the original person's body structure (e.g. body and head size difference). We can use this information to seek any irregularities in the body's proportion of the person of interest in the image.

3) ***Finding the copy of the fake individual in the image to its original source.*** An example of this type of attack is when the attacker forges an image to have a target person who initially not available in the image to be available using image splicing technique, and making it look believable. The idea here is that the face image that the attacker used must have been taken from the Internet. To handle this problem, a system must be made to seek the similar facial image of that person from his social media or any other sites that he might have made the image available. This would need a search algorithm and a face recognition system to be made for finding the target person on the Internet (with permission from the owner).

When dealing with the recognition problem, the system must be trained with proper data. It is essential that the target individual images are made available for the system to train with the permission of the owner. This means that the information of the target individual must be included when making a comparison between the fake image and the original one. This is crucial because if the pixel-based detection method does not succeed, there will be no sure-fire way for the system to know that the image is a fake unless there is something to compare it with and that something is the target person himself. Nevertheless, these methods are some of the ideas from the author that can be worked upon to counter this type of image forgery. Another idea would be to improve the passive detection methods even

further, by finding out how the attacker hides the tampering operation so well. Overall, even when the attacker has an advanced technique to evade the detection, forensic and researcher will surely have a lot of different ways to come up with a counter solution.

Reference

[1] MyCERT - The Malaysian Computer Emergency Response Team | Incident Statistics - (https://www.mycert.org.my/en/about/contact_us/main/detail/18/index.html), Accessed: 03 April 2019.

[2] Cox, Ingemar, et al. Digital watermarking and steganography. Morgan Kaufmann, 2007.

[3] Qazi, Tanzeela, et al. "Survey on blind image forgery detection." IET Image Processing 7.7 (2013): 660-670.

[4] Birajdar, Gajanan K., and Vijay H. Mankar. "Digital image forgery detection using passive techniques: A survey." Digital Investigation 10.3 (2013): 226-245.

[5] Afchar, Darius, et al. "Mesonet: a compact facial video forgery detection network." 2018 IEEE International Workshop on Information Forensics and Security (WIFS). IEEE, 2018.

[6] Photo Retouching (https://www.fotor.com/features/photo-retouching.html), Accessed: 03 April 2019.

[7] P. Leskin, The Ai Tech Behind Scary-real Celebrity 'deepfakes' Is Being Used to Create Completely Fictitious Faces, Cats, and Airbnb Listings (26 February 2019) -(https://www.businessinsider.my/deepfake-tech-create-fictitious-faces-cats- Airbnb-listings-2019- 2/?r=US&IR=T), Accessed: 03 April 2019.

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DIGITAL LITERACY & RESILIENCE: BUILDING A SAFER WORLD FOR CONNECTED - CHILDREN

By Wardah Mustafa Din & Shamsuriani Md. Jamal

Moving towards the fourth industrial revolution of digitalisation of almost everything, the emergence of fancy handheld gadgets and the 5G Internet is unavoidable. The Internet offers a vast array of opportunities to us as users, and also to many industries. Embracing all the technologies that come with the revolution is inevitable, as those who miss out would eventually be unable to survive. The change effects throughout the ecosystem, both horizontally and vertically, starting from individuals up to the nation and policies, and across from infants to adults, leaving no one behind.

The Internet opens up new doors to everyone, and it allows children to explore things that were impossible a decade ago. According to UNICEF, by engaging with digital media, children learn new skills and develop their talents, and thus become informed citizens of the world. The Internet opens up unlimited information to children, both good and bad. As the opportunity expands for children, unfortunately, so does the risks. By just a click on a keyboard, our children may be exposed to many threats online such as pornography, extreme violence, online gambling, sexual grooming and cyberbullying. According to Mr Wisit Atipayakoon, Programme Officer of the International Telecommunication Union, there are at least six common threats online which are online sexual exploitation and abuse, illegal and inappropriate content, online fraud and gambling, identity theft, cyberbullying and game addiction.

A nationwide school-based survey involving 212 secondary schools and 27,202 respondents showed 6 in 7 secondary school adolescents were active Internet users and 2 in 7 were addicted to the Internet. According to the 5th Malaysian Population and Family Survey by LPPKN in 2014, 35.3% of adolescents were exposed to pornography. This survey was done to approximately 57 thousand people and 25.7% were adolescents age less than 15.

As alarming as it is, parents and stakeholders of the community have to understand that protecting our children by barring them from the Internet and other digital technology is not the right way. The Internet nowadays is everywhere and almost unavoidable in daily life. As much

as there is no shield that is strong enough to protect our children from the threats that linger on the Internet, our only option is to teach oneself and our children to confront these threats wisely.

Continuous education is of utmost importance in handling the dangers and threats of the Internet. One has to understand the threat to prevent oneself from it. For example, to protect and be safe while crossing the road, children were thought practically to look right, left and right again before crossing the road. We showed them that it is safer to cross on zebra crossings and at traffic lights or use the flyover. They are warned not to communicate with strangers and taught on swimming lesson to avoid drowning. We anticipated these dangers and prepared them to face and overcome these dangers. On the other hand, as Internet threats are not expected or predicted, society is not prepared for it's after effects. Nevertheless, it is never too late to make the Internet a safe playground for our children.

End users need to be able to access, analyse and evaluate the content from the Internet and other digital technology. This is called digital or cyber literacy. When our children have this literacy, they are empowered to be responsible in the digital world, taking control of the media content and digital technology rather than being passive passengers, letting the media controlling them. Children need to learn self-regulation and being resilient in the cyber world, as we want them to be in the real world. Every child has the right to have access and connectivity, but at the same time, they also have the right to be equipped with the right skills to experience the Internet in a safe and responsible way.

Along with digital literacy, children will develop online resilience. According to the literature, resilience means the ability to return back to its original shape after being bent, pressed or stretched. In this context, we would like to highlight digital resilience as the ability to self-regulate online and be resistant and cope with online threats. Digital resilience will help children to cope with whatever the Internet throws at them, hence protecting them in the limitless digital world. The level of digital resilience among

each child varies. Some studies have suggested that a higher number of children who coped better in the digital realm were those who confided others regarding their online problems and employed problem-solving activities such as blocking contacts and deleting comments (Vandoninck, S. et al., 2012). This highlights that the ability to navigate the right way in the digital world is an important skill to nurture in children as an initiative to make the digital playground a safer space to explore.

To succeed at this, we need a concerted effort among parents, families, school and the community. Protecting children online is a global challenge, hence a global and holistic response is required. Here we highlight 10 points that are important to include in upskilling our young generations, as suggested below:

1. **The online community values are community driven, especially in social media.** The content that lingers around our children are being created by the community they are following and near to. Having the right community online would keep them safer. Parents should keep an eye on groups and friends of our children. Make them understand that not everyone online is 'good'.

2. **Keep communications open between parents and children.** This will make sure children return to responsible adults for advice if they come across any threats online. Otherwise, you will never get the story from them.

3. **Educate children to filter, block and flag inappropriate content.** Show them how it is done in sites that they usually visit such as YouTube, Facebook and Instagram. If they are too young, make them tell it to you so you can report the sites for them.

4. **Many experts advise placing any gadgets, laptop and desktops in the common area in the house, NOT in the bedrooms.** This actually helps both ways, for the parents to safeguard and to be in the know of what children are doing online, and for the children to learn self-regulate themselves online.

5. **Limit usage of the Internet to a specified duration.** Encourage offline, healthy and fun activities such as sports activity, exercise, reading books and meet up with friends.

6. **Use of filtering mechanism or application of the Internet which will be able to block the unsafe websites.** There are many tools that parents can use to do this. Many telecommunication companies offer in-house apps or safeguard packages like Kakatu by UMobile and FamilySafety by Digi. Parents should proactively update themselves with these applications.

7. **Educate our children, which information is safe to be shared with others and which are not.** Personal information such as a home address, handphone numbers, name of school and account numbers are private and very dangerous if shared to the public.

8. **Sharing pictures, especially on social media is a trending habit.** Make sure our children understand that any picture uploaded online are able to be retrieved and saved by anyone, even if it's on Snapchat, people can screenshot them. You can never delete a picture if it is in other person's possession. If they understand this, they would know to only post appropriate pictures online.

9. **Never ever share your password with anyone.** Passwords are to be kept private every time, everywhere. This includes all passwords of your social media, email, online websites and so on.

10. **Mind your words online, even though you are anonymous.** Don't make your anonymity step over your manners. Values and manners are as important as it is online and offline.

If we want the online ecosystem to have the right kind of impact on the society in the future and socially sustainable, it is our responsibility to ensure that the core values are preserved and enhanced especially for the younger generations. We should focus on prioritizing development of children emotional, intelligence, moral competencies, and their resilience online, bearing in mind that the values of the whole ecosystem of the digital nation are created by them as our future generations. Policies and regulations should also address the change as digital participation is part of the new era and the society should be empowered to embrace this revolution. Let's all work together to upskill digital literacy and enhance our digital resilience to ensure the safety of our connected-children.

Reference

[1] 5th Malaysian Population and Family Survey (2014) Lembaga Penduduk dan Pembangunan Keluarga Nasional (LPPKN).

[2] Vandoninck, S., Haenens, L., Segers, K. (2012) Coping and resilience: Children's responses to online risks. In: Livingstone, L., Haddon, L., Gorzig, A. Children, Risk and Safety on the Internet, 1st Ed. Bristol: Policy Press, pp.205-218.

[3] Child Online Protection Asean Seminar, Putrajaya (2017).

*Both writers are activists of an NGO, Malaysians Against Pornography (MAP), which advocates and raise awareness to the public on the danger of Pornography and the importance of safe-use of the Internet.

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DIGITAL ANATOMY: ARE WE READY FOR IT?

By Mohamad Fairuz Yahaya, Fairus Ahmad, Elvy Suhana Mohd Ramli, & Teoh Seong Lin

Human anatomy is a branch of medical science that studies the structure of the human body. It is a pre-historic science, believed to have been existed for over two millennia. It owes its name from the Greek which came from the words 'ana' meaning 'up', and 'tome' meaning 'a cutting'. Over the years it evolves into many disciplines, which include macroscopic anatomy that examines the body parts using unaided eyesight, microscopic anatomy that utilizes optical instruments to study various tissue structures or individual cells known as histology, and developmental anatomy or embryology that studies the various stages of human development post-fertilization until adulthood.

Human anatomy is an integral part of basic medical science. It provides an overview of the human body, a valuable insight into every detail of human structure from its visible form into the very minute details that needed aid from the optical machines. Medical, dental, nursing and midwifery students rely on much of the human body information through the subject of anatomy during the first year or two of their studies. While other health-related subjects such as paramedics, occupational and physiotherapist, biomedical science, audiology and speech therapist, and forensic science may also need some knowledge of anatomy.

Traditionally, dissection of cadaver has been the preferred choice to study anatomy. Cadaver is the dead human body which has been donated to the medical institution for the purpose of study and research. It is a valuable hands-on approach that makes it more meaningful for the medical and dental students as it is the first contact reality with the human body. It provides students with systematic learning by regions and topography as well as allowing the students to feel the various texture variation of the human tissue; something that no other teaching methods can provide. However, this method of teaching and learning is currently under threat due to the shortages of cadavers. This is not just true in Malaysia but also experienced by medical colleges around the world. Various reasons have been cited; the lack of awareness and benefits of donating body for science, religious reasons, increase in the number of colleges that offers medical science, decrease in the number of anatomist and experienced lab technician that handles the cadavers and many more. Preserving the cadavers itself is a tedious and costly process as it involves the use of preserving chemicals that is carcinogenic (cancer-causing agent) and produces an unpleasant odour, not to mention the limited lifespan of the cadavers where it will lose its form and degenerated after some time. Some colleges have even abandoned teaching using cadavers and opted with models and digital technology instead. At the Anatomy Department, Faculty of Medicine UKM, this old method of teaching is still kept alive not only as a tradition but also to serve as a reference point for other medical faculties from all over the country. But shortages of cadaver do hit us hard.

Technology is no stranger in the field of anatomy. During the 1950s and 1960s, many of the anatomists began using the electron microscope to venture further into the world of histology and cytology to define the cell morphology and its function. Gross anatomy also has evolved into the use of the cast model and plastination. Plastic models for organs have been used in Germany since the 1930s. Interestingly, it is the anatomist from Germany, Dr Gunther von Hagens, who worked for 10 years since the mid-1970s perfecting the technique of plastination where the body's oil and water were substituted with polymerised material. The cadaver becomes hardened and casted in its own shape, which permits the students to touch without the use of gloves, eliminates the foul smelling odour of formaldehyde and the risk of carcinogens. Nevertheless, it has its limitation where only the exposed parts can be viewed; unlike the dissected fresh cadavers where the students still have the chance to explore.

Because of these restrictions, coupled with the advancement of the digital technological age, we began to see the emergence of computer-assisted programs in teaching and learning anatomy. As early as 2004, a medical college reported to have taught anatomy without the use of cadavers but instead using projectors and Microsoft PowerPoint to project anatomical images onto the human body surface. From here on, the images have progressed from 2D images into 3D images, and the use of CD-ROM has moved on into Internet web-based access. Moving forward, a company called Primal Pictures, for example, provides the reconstruction and deconstruction of image layers where it enables the user to add and remove structures to allow views of differing anatomical depths as well as rotation of their models. The current state of the art technology in anatomy is the Anatomage Table, a virtual dissection table where fully segmented real human 3D can be visualized exactly as they would on a fresh cadaver. Individual structures are reconstructed in accurate 3D so that undergraduate or postgraduate students can explore and learn human anatomy without the limitation any cadaver could offer. There is also virtual reality 3D where the students can utilize their own smartphone and navigate the virtual human body during the class. This technology is, however, still in its early stages.

All these advancements possess not only benefit but also challenges for those providing anatomy courses. This is an era where curriculums must be delivered in reduced teaching times and reduced number of tutors. Not only that, the computer literacy of the students accepted to the program sometimes exceed those of the faculty members because of the requirements during intake. This should be taken as a blessing in disguise because it eliminates the needs to train the students should these technologies are adopted as part of the program. The most pressing issue is the cost to include all these technologies to the curriculum as the set-up cost would be beyond reach for some colleges, especially in the developing countries. An economic impact study should be performed to look at the value of adopting these technologies against the financial burden in the long term.

With the inevitable advancement of digital anatomy, the next question is whether we should abandon the use of cadavers completely. Keeping the cadaver in its preserved state is by itself expensive as it involves the use of chemicals, long man-hours to dissect, and storage cost. However, one would argue that there is no substitution in learning the human body other than the cadaver itself because of the tactile, visual and olfactory senses and also emotional responses that involve in the dissection would forever stay long with the person. As there are no standardise universally acceptable version of teaching undergraduate anatomy, the priority should be for the student to gain the basic knowledge of the underlying concept and with ease to recall the required information. Whilst the debate of using the traditional method of cadavers will always continue, we should also embrace the use of technology as long as it benefits the students to understand and enhance their learning potential. For us, the technology is there to assist in disseminating the knowledge and at the same time, we will try to preserve the conventional method as a valuable reference point for generations to come.

So, are we ready to embrace digital anatomy? Only time will tell.

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IN THE EYES OF EMPLOYEES: WHAT MAKES A DIGITAL LEADER?

By Iylia Amira Rosli, Fatimah Zuhra, & Nina Asmida Mohamad@Johari

The modern age environment is a game-changer for businesses and their leaders. The combination of globalisation, the rapid development of technology and the emergence of data and knowledge as the major currencies have changed everything. So does in having a competent leadership, which has become the most important skills in the digital age. Recently, Suruhanjaya Komunikasi dan Multimedia (SKMM) has introduced the 5G implementation programme in Malaysia; thus, making Malaysia the first country in Southeast Asia to launch Mobile Technology Exhibition on Fifth Generation (5G). It features a long-term plan to further enhance the communication and technology system in the country. The 5G does not only bring improvements in terms of speed, but it also develops the information and communication technology in Malaysia. Although its widespread uses are not expected at this time, the 5G technology reduces issues and obstacles that occur on the existing 4G network. Both the government and private sectors are looking forward to the benefits that can be further reaped from the 5G implementation.

Digitising the business can only be successful if the people working in the organisations are supportive of it. Getting people's buy-in is only possible if the company's top management is taking the lead. How is this possible? Firstly, the leader must possess digital literacy. For example, Tony Fernandes is a digital leader that understands and appreciates the role that technology plays in our working hours. Digital literacy is defined as the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.

Second, leaders must be visionary by being able to inspire others to believe in their vision. Tony Fernandes is convinced that he can make it possible. He shares his vision with the staff and trusts the early adopters to accept the new technology whilst providing sufficient time for the doubters to acclimate themselves to the same technology. Third, he as a digital leader is not afraid to take the risk or to fail. This encourages him to experiment and innovate for the company to grow. The digital leader realises that part of the digital strategy is also to change the management method. The digital team should have the freedom to make decisions, organize themselves and have the ability to work independently. Besides that, the role of a digital leader is to create digital infrastructure and implement new processes and tools that are aligned with company's goals and strategies. Tony Fernandes always understands that despite the importance of achieving business objectives, the secret behind the airline's success is that the people always come first.

What makes a digital leader is an ongoing discussion topic among scholars and practitioners alike. However, most of the written articles disregard the employee's perspective. Arguably, the employee's perception of the digital leader is an important aspect of furthering knowledge. Self-proclaimed digital leader or even a third party's labelling of a leader provides only a partial picture of the complete whole. Therefore, a study was conducted by a group of MBA students from UKM-Graduate School of Business to identify the attributes of a digital leader.

The questions were developed based on digital leadership literature, which mostly sourced from popular writing publications. 120 respondents participated in this study. They were employees working in various organisations in Malaysia. 57.3% who filled out the questionnaires were women and the rest were men. The ethnic composition comprised of Malay (82.7%), Chinese (9.3%), Indians (6.7%) and others (1.3%). The highest level of education attained was a bachelor degree (69.3%), followed by a master degree (25.3%), and a diploma (2.7%). As many as 57.3% of workers came from private sectors and the remaining workers were working in the public sector.

Table 1: Attributes of a digital leader

Attributes	Respondent (%)
1. The leader has a sturdy vision	58.3
2. The leader is curious about how technology can meet customers' needs	48.3
3. The leader encourages digital collaboration among different units	55.0
4. The leader encourages employees to be creative in using new technologies to ease their daily jobs	49.2
5. The leader values digital networking	50.8

As shown in Table 1, the majority of the employees surveyed agreed that the most important attribute of a digital leader is to have a clear and solid vision about digital transformation. The second most important attribute of a digital leader is the leader encourages digital collaboration among different units. At the third place is the leader values digital networking. Fourth, the leader encourages employees to be creative in using new technologies to ease their daily jobs. The least important attribute of a digital leader according to the surveyed employees is that the leader is curious about how technology can meet customers' needs.

This study illustrates that having a strong vision in implementing digital transformation is a must have indicator of a digital leader. It comes with no surprise because being visionary is the convergent point of all efforts in transforming a workplace into a digital workplace. If a leader is able to place the vision properly in a sturdy manner, then employees will be able to identify it; hence, they can refer their superior easily as a digital leader. This study also demonstrates that what comes next is how the employees evaluate the leader who motivates the internal people towards materializing the vision in the workplace. Encouraging digital collaboration, encouraging digital networking, and encouraging employees to use technologies creatively in their daily jobs are the leader's actions towards the employees to embrace digital transformation. With these actions, employees perceive that their superior is worthy to be called a digital leader.

Although customers are important, the survey reveals that the employees attach little meaning to a leader whose effort is directed at improving customers' needs through the use of technology. It could be because using technology is a common expectation nowadays. Technologies improve efficiency and effectiveness. Even when a leader has no sturdy vision about digital transformation, the organisation is expected to use some form of technologies, which eventually increase the effectiveness and efficiency of the work process that will satisfy the customer needs.

Taken together, a digital leader should be seen from multiple perspectives – self, employees, customers, and third parties. In this article, we suggest that a leader should understand the attributes of a digital leader as perceived by the employees in order to influence their behaviours at the workplace. As seeing is believing, having a sturdy vision on digital transformation must be the first priority of all leaders if they want to be known as digital leaders from the employees' perspectives.

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THE INFLUENCE OF DIGITALISATION ON EMPLOYEE ATTITUDES

By Isaac Sharvindran A/L Seigar

On the 11th December 2017 at the Ministry of Communications and Multimedia Towers, the Communications and Multimedia Ministry has proactively formulated the Communications and Multimedia Blueprint (CMB) 2018 – 2025 to empower and strengthen the country's communications and multimedia sector. Deputy Minister Datuk Seri Dr Jailani Johari said the blueprint, which took 15 months to complete, would prepare Malaysia to become more connected in a digitally advanced era and be a digital nation. According to Nicola Villa, the Managing Director of Cisco Consulting Services, a digital nation, by definition, is a connected nation – able to share information and intelligence dynamically, in real time or something very close to that, across a network. In accordance with this initiative, many organisations have already started to move towards digitalisation in their respective workplaces. Changes in the attitudes of the employees can be clearly visible in conjunction with this issue. An attitude is a psychological state of mind where it is the way an individual thinks about situations, and it ultimately determines a person's behaviour. The success of an organization depends mostly on the employee's behaviour. Hence, there are few changes in the attitudes of the employees due to digitalisation in their workplace.

First of all, is the speed of work and inclusiveness. The society is increasingly digitalised and consequently forced organisations to do things faster especially in decision-makings. Due to this trend, projects will have shorter timelines. The accelerating pace of business puts on higher pressure on an organization to act quickly and thus, focusing on only short-term results instead of long-term results. Employees would always want to feel empowered and engaged in their job respectively, especially the millennials. Those senior workers, especially the baby boomers, may face some problems due to the speed of work needed in the fast-moving trend. Since they are very much used to the traditional way to work manually, this digitalisation may cause them to feel alienated in their organization and this, in turn, will make them lose their interest in their job and eventually will be less productive than before. In the long term, this kind of attitudes will cost them dearly.

Besides, metrification and alerts are also closely related to this issue. Digital technologies can measure previously unquantifiable parts of our lives, yielding crisp knowledge into how we invest our energy. On an individual dimension, the employee

can follow their means and check their preferences, companions, and supporters. At work, they are greeted every morning with many unopened messages and reminders of arrangements of meetings. Amid the day, employees are hindered by nonstop instant messages, streams of emails, and texts. It is true that many such notifications and messages are helpful and inevitable, but many others do little than to distract them and shift their focus from the important tasks at hand, undermining productivity rather than enhancing it. The employees will in turn experience more time pressure and effort, frustration and stress due to all this interruption as they have to complete all their tasks in the time given despite all the interruptions along the way. Therefore, the organization will experience low employee performances. Constant streams of messages prioritised in terms of importance can create cognitive scarcity, which in turn will deteriorate the employee's ability to adequately process information. Another cognitive impact of such a large number of alerts and too many unfiltered information is choice overload. Employee encountering choice overload often finds that it is difficult to make decisions except if clear environmental prompts or default alternatives are established to help direct their decision-making. Information overload is not only distracting but potentially damaging to the employees' mental health.

Furthermore, employees will experience physical disconnection, anxiety and depression. Due to this digitalisation at the workplace, employees deal with most people through technology. Technology is having a profound negative effect on social well-being. Although it helps them to get things done and enable them to engage with others across distances and time zones when dealing with overseas clients, this comes at the expense of the good old-fashioned face-to-face relationships. Everyone would be busy facing their laptop and computer screen in order to complete their tasks. This, in turn, creates a distance among the employees as everyone is only focused on their own tasks and there is not much face-to-face communication. Sooner or later, the employees will no longer have much interest in socialising

with others. We live in a finite amount of time and a limitless well of information and choices, this will result in the fear of missing out. This occurs highly among the baby boomers or even sometimes the current generation who are not well adequate with the latest technology trend. They have to work in accordance with the technology shift together with all the employees. They may end up having anxiety and depression due to not able to cope up with this kind of situations.

In accordance with the issues faced by the employees, the employers can play their parts effectively in order to improve the situation and thus preventing it from becoming even worst. Employers can encourage the use of artificial intelligence in order to promote healthier behaviour among employees. This artificial intelligence can help the employees to better mediate their interaction with technology and helps them to focus on higher-level tasks. For instances, some of the email systems use artificial intelligence to sort out emails into a few categories in which employees will be able to locate important emails easier. Certain artificial intelligence products can be designed so as to reduce the stress and anxiety faced by the employees in their respective jobs.

Apart from that, employers have to provide training for the employees in regards to the digitalization at work. This is to help all the employees to have a better understanding of the new system so that it will ease their job and thus able to complete their task as usual. This will help them to come out of their comfort zone which is the usual traditional ways of doing their job. For example, in a certain insurance organization, the system has been changed where their work submission, registering and settling their first payment everything is done through a system using an iPad. When the organization introduce this method, many of their employees struggled to learn the method. Moreover, the employers also should be patient with their employees to learn the new system and progress in it. Offering learning and development opportunities that add value to an employee's skill set and knowledge places value on their future. When the

employees are well equipped with the knowledge needed on this matter, then they would not need to be dependent on other employees when they come across any issues regarding the digital shift at the workplace. This situation would most likely help employees who are baby boomers who are very much used to the old traditional ways at work. This training will be an eye-opening to them and enable them to cope up with other employees.

Last but not least, employers should help their employees to embrace agility. Agility is said to be the key to success when an organization go through digital transformations. The current technologies and consumer needs change quicker than conventional business guides can convey, and employees should be prepared and empowered to move at this pace. The most ideal approach to drive this move is to build a set of tangible day-to-day activities and practices that will enable employees to act quickly and efficiently.

In a nutshell, everyone has to be ready to be equipped with knowledge on the current technological trend as Malaysia is in the path towards a digital nation. We should not limit ourselves to just stay in our comfort zone. Therefore, we must allow ourselves to be more open minded and have the willingness to adapt and accept the current changes that take place in our workplace and nation. With this attitude, we as the citizens of this nation would not be left far behind in the process of achieving the goals of our nation. We should work hand in hand with our nation to achieve its goals so that Malaysia will also be looking up unto as a great and well-developed nation in the eyes of the world.

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GENENERASI Z DAN PERKEMBANGAN PERNIAGAAN DIGITAL MASA HADAPAN

Oleh Arawati Agus

Warga Malaysia masa kini menuju ke arah bangsa digital yang celik teknologi selaras dengan perkembangan pendigitalan sejagat. Banyak negara sudah mula menerapkan visi dalam melaburkan sumber membina sistem digital yang semakin canggih dan berteknologi tinggi. Kerajaan Malaysia juga tidak ketinggalan meningkatkan rangkaian sosial berdigital yang selamat, pantas dan efisien. Malah ianya juga turut di perkukuhkan lagi dengan sistem governan yang telus dan berdaya maju. Pendigitalan boleh memberi manfaat kepada banyak bidang dan pengsektoran, terutamanya untuk kepentingan masyarakat dan negara. Dalam bidang perubatan, pencegahan risiko penyakit secara pintar, pengkongsian sumber perubatan awam, fasilitasi latihan pakar perubatan, dan kolaborasi operasi bagi kemudahan perubatan dapat memudahkan atau menyelesaikan banyak masalah perubatan. Dalam bidang pelajaran pula, aplikasi pendigitalan juga memberi sumbangan yang sangat baik seperti pengajian jarak jauh, silibus berasas pelanggan, kuliah virtual yang memudahkan pelajar pengajian jarak jauh serta ianya juga mampu mengatasi pelbagai cabaran yang dihadapi. Dalam bidang komunikasi, kerajaan juga sedar akan kepentingan komunikasi digital baru seperti komunikasi hologram yang dibangunkan dalam

meningkatkan kualiti akses bagi rakyat Malaysia. Pendigitalan juga dapat membantu pelaksanaan dan memudahkan penyelarasan program-program dalam bidang yang lain.

Kejayaan mewujudkan sistem digital amat bergantung kepada kewujudan persekitaran teknologi tanpa sempadan yang universal serta mampu mempromosikan integrasi penggunaan tempatan dan antarabangsa. Pendigitalan kini telah menjadi tren global. Justeru, dengan pembangunan infrastruktur dan teknologi (contoh jalur lebar, Internet, *cloud*, data raya dan lain-lain), pendigitalan telah melalui beberapa fasa perubahan dari hanya menyediakan maklumat asas kepada keupayaan pintar yang komprehensif kepada pengoptimuman agihan sumber yang kondusif. Pendigitalan mampu menambah baik komunikasi dan kemudahan kehidupan harian bagi semua golongan. Walau bagaimanapun, generasi yang didedahkan kepada asas teknologi dan pendigitalan sejak lahir lagi dan yang paling banyak melihat manfaatnya dalam kemudahan pendigitalan adalah Generasi Z. Golongan muda di kalangan Generasi Z ini banyak menggunakan dan mengaplikasikan kemudahan digital dalam kehidupan mereka. Bagi memudahkan pemahaman mengenai transisi generasi dahulu sehingga

Generasi Z, berikut merupakan lima generasi utama yang disenaraikan:

1. Traditionalis (*Traditionalists*) - Lahir di antara 1928 dan 1945
2. Bayi Boomers (*Baby Boomers*) - Lahir di antara 1946 dan1964
3. Generasi X - Lahir di antara 1965 dan 1979
4. Generasi Y (*Millennials*) - Lahir di antara 1980 dan 1995
5. Generasi Z - Lahir di antara 1995 dan 2010

Generasi Z adalah mereka yang dilahirkan di antara tahun 1995-2010 (Forbes, 2015). Mereka dianggap sebagai pengguna tegar kemudahan sistem digital. Sejak dari zaman kanak-kanak atau remaja lagi mereka sudah terdedah kepada internet, rangkaian sosial dan sistem telefon pintar. Semakin berkembang skop perhubungan, generasi ini mungkin membentuk sikap dan cara hidup berlandaskan Internet serta komunikasi atas talian. Golongan muda ini mempunyai pengaruh yang kuat terhadap rakan dan keluarga mereka terutama mengenai cara penggunaan dan minat mereka terhadap jenama, idea dan hobi. Di Malaysia Generasi Z hampir membentuk sebahagian penting dari populasi negara. Tujuan utama penulisan ini adalah untuk memahami bagaimana Generasi Z ini mampu mempengaruhi penggunaan dan penjenamaan digital di kalangan mereka yang sedikit sebanyak turut memberi kesan kepada masyarakat sekitar secara amnya.

Generasi Z dilahirkan selepas Generasi Y yang kadangkala dikenali sebagai generasi millenial. Generasi Z cenderung kepada pendigitalan dan urusan atas talian kerana mereka sudah di dedahkan kepada Internet, telefon pintar, media sosial dan *Youtube* sejak mereka lahir ke dunia ini lagi. Mereka mampu mencari rakan Internet dan berkongsi maklumat atau menjalankan perniagaan digital kecilan di kalangan komuniti yang mereka sendiri wujudkan. Jadi tidak hairan jika perkara berkaitan perniagaan dan keusahawanan digital mudah bagi mereka untuk memahami dan mengaplikasikannya. Malahan, ada di antara mereka telah berjaya dalam perniagaan kecilan di Internet. Mereka sangat fasih bertutur dalam bahasa digital dibandingkan dengan generasi lain. Mereka merasa selesa dan bijak menyesuaikan diri dalam dunia digital serta tahu bagaimana memanfaatkannya. Namun mereka lebih telus dan jarang mengutarakan slogan yang menarik perhatian dalam urusan jualan. Mereka lebih percaya bahawa mesej yang diutarakan patut menyumbang kepada komuniti dengan cara yang bermatlamat dan bermakna.

Ramai percaya bahawa Generasi Z ini mempunyai ciri dan minat keusahawanan. Mereka berpotensi mewujudkan peluang mereka sendiri dan menceburi diri dalam perniagaan digital secara kecilan pada peringkat permulaan. Malahan ada yang sudah berjaya mencipta nama sama ada dalam kerjaya atau perniagaan. Sering kali kita dengar Generasi Z ini menjual barangan mereka atas talian sama ada biskut, kek, serta baju dan tudung yang baru atau terpakai (*preloved*) dan mereka sangat pintar dalam mempromosikan jualan mereka. Generasi Z ini mempunyai ciri semula jadi yang boleh melonjakkan mereka ke arah perniagaan kecil digital. Perniagaan dan keusahawanan digital dan atas talian

ini mampu mencetus kesan yang signifikan kepada ekonomi, pertumbuhan kerja, membentuk cara kerja masa depan dan mencipta produk dan perkhidmatan yang baru. Generasi Z menonjolkan kuasa mereka menjana pendapatan daripada perniagaan digital kecilan yang tumbuh macam cendawan selepas hujan di dunia perniagaan menerusi alam maya.

Kenapa Generasi Z ini boleh dianggap sebagai pendukung perniagaan kecil digital masa hadapan? Ini adalah kerana Generasi Z berada di ambang tren digital dan teknologi. Adakah amat penting untuk memahami ciri-ciri dan keperibadian dan minat Generasi Z? Ini adalah kerana mereka akan muncul dan mempengaruhi perniagaan digital masa depan (Forbes, 2017). Ditambah dengan kombinasi keperibadian umum seperti dedikasi, optimistik, dan savvy teknologi, berikut adalah beberapa sebab kenapa Generasi Z boleh mencetus serta mencorak tren perniagaan kecil digital masa hadapan:

1. Mereka dilahirkan di Alam Digital
Generasi muda terutama Generasi Z tidak payah di perkenalkan lagi dengan kuasa digital kerana mereka sudah arif tentangnya. Kebanyakan Generasi Z menggunakan teknologi, Internet dan media sosial untuk mengembangkan skop dan pengetahuan mengenai dunia di sekeliling mereka. Mereka percaya teknologi boleh menolong mereka mencapai dan merealisasikan idea dan impian mereka. Kebolehan mereka untuk menguasai kaedah atau peralatan digital boleh menolong generasi muda ini mencapai matlamat ke arah minat, hobi dan perniagaan mereka.

2. Mereka mempunyai sikap tanggungjawab sosial
Generasi Z peka terhadap perkembangan dunia sekeliling mereka. Ini mungkin disebabkan kebolehan mengakses maklumat yang penting, terkini dan jitu hingga memupuk motivasi yang tinggi untuk menyelesaikan masalah dalam mencapai impian mereka. Ramai di antara mereka mencari karier yang mampu merealisasikan impian dan minat yang berkobar. Mereka meletakkan keutamaan tinggi untuk mencapai hasrat menjawat pekerjaan yang mempunyai impak kepada dunia atau persekitaran mereka. Malah mereka berkebolehan melihat sesuatu masalah masyarakat dengan menyelitkan peluang perniagaan yang bersesuaian bersamanya. Mereka juga mampu mencari penyelesaian kreatif yang boleh dikembangkan sebagai sebuah perniagaan.

3. Mereka celik teknologi, inovatif serta kreatif
Generasi Z berkemungkinan besar membentuk perniagaan menggunakan kemudahan teknologi dan digital disebabkan teknologi adalah sebahagian daripada kehidupan mereka sejak kecil. Jika mereka menjadi usahawan, Generasi Z ini lebih cepat mengaplikasikan peluang teknologi dalam memudahkan urusan harian atau mencipta cara baru yang kreatif dan inovatif bagi memperoleh hasil positif daripada penggunaan teknologi dan digital.

4. Mereka mengutamakan budaya perniagaan
Kemunculan perniagaan kecilan atas talian yang menerapkan unsur kegembiraan dan santai dalam persekitaran kerja adalah selaras dengan keinginan Generasi Z. Mereka sering menerapkan mentaliti "kerja kuat, main kuat", dan golongan

Generasi Z ini percaya keseimbangan hidup adalah penting kepada kejayaan mereka dan sering mencari kerja yang menerapkan budaya syarikat perniagaan. Sungguhpun demikian, kebanyakan Generasi Z ini lebih berhasrat menjadi "bos" dan mereka ingin membina budaya perniagaan dengan cara mereka sendiri. Dengan dorongan motivasi dan berkeyakinan berdiri atas kaki sendiri, Generasi Z percaya mereka mempunyai kuasa dan pengaruh untuk membentuk persekitaran yang mereka ingini.

5. Mereka sanggup memikul tanggungjawab tambahan untuk mencapai matlamat

Kebanyakan golongan Generasi Z ini agak rajin. Mereka akan cuba mengimbangi pelajaran atau kerja sepenuh masa dengan perniagaan kecilan atau kerja tambahan yang mampu menjana pendapatan. Mereka biasanya berminat membuat kerja sambilan yang mempunyai ciri keusahawanan yang selaras dengan minat, hobi dan kegemaran mereka. Ada di antara mereka sanggup menggalas tanggungjawab tambahan agar dapat menampung perbelanjaan seperti pembayaran bil, yuran kuliah atau membeli sesuatu istimewa yang diidamkan. Di antara Generasi Z ini, ada yang mempamerkan dedikasi jitu dalam mencapai matlamat mereka.

Kecenderungan mengalas tanggungjawab yang berat, di samping kecekapan aptitud mengimbangi beberapa komitmen diri, menjadikan ciri Generasi Z lebih berkeyakinan dalam membangunkan usahawan berasaskan digital sebagai langkah ke arah perniagaan kecil.

Malahan mereka mungkin menghasilkan perniagaan kecil digital masa depan secara sengaja atau tidak sengaja bermula daripada minat atau usaha untuk menambah duit poket.

6. Mereka berusaha melakukan perkara yang mereka minati

Mengejar impian merupakan keutamaan bagi golongan Generasi Z. Sesuatu perkara yang diminati, mereka akan lakukannya dengan sebaik mungkin. Biasanya mereka tidak hanya mencari kerja yang boleh menyara diri sendiri tetapi akan cuba meninjau peluang pekerjaan yang bersangkutan dengan minat mereka. Jika mereka meminati masakan atau fesyen, mereka akan cuba membuat perniagaan kecilan seperti menjual biskut, kuih, baju, tudung bagi wanita manakala jualan juadah makanan, t-shirt, topi atau kasut secara atas talian lebih menjurus perniagaan untuk kaum lelaki. Apabila perniagaan kecilan yang diceburi menampakkan sedikit hasil, ini akan menjadikan titik permulaan mengembangkan lagi perniagaan kecil secara atas talian dan digital. Ciri-ciri ini meletakkan mereka sesuai digelar usahawan digital atau usahawan atas talian masa hadapan.

7. Mereka mempunyai akses yang lebih kepada sumber yang lebih baik berbanding generasi sebelum ini

Dunia atas talian dan digital merupakan perkara lumrah kepada Generasi Z. Sejak kecil lagi mereka sudah di dedahkan kepada kaedah pembelajaran Internet. Mereka boleh menimba maklumat dan ilmu penciptaan berdigital tanpa sempadan dari ruang sempit bilik mereka. Mereka sering melayari dan mendengar tip dan nasihat yang praktikal dari pakar-pakar atas talian. Malahan ada yang sudah menceburi bidang perniagaan kecilan atas talian sebelum mereka melangkah masuk ke menara gading. Ini berbeza dengan generasi terdahulu yang dikatakan amat sukar untuk mendapat pembiayaan. Namun kini, banyak program dan maklumat mengenai peluang dan sumber yang ditujukan khas untuk golongan remaja Generasi Z sama ada dari kerajaan atau pihak swasta. Program-program tersebut membolehkan Generasi Z memperoleh peluang dengan memberi bimbingan, meningkat rangkaian rakan serta hubungan dan membentuk perniagaan lebih awal berbanding generasi-generasi sebelumnya.

Sebagai kesimpulan, Generasi Z adalah generasi yang paling berdigital dan mengerti teknologi disulami dengan sikap berdikari. Walaupun generasi sebelum ini juga membesar dengan Internet tetapi Generasi Z tidak merasa selesa hidup tanpa Internet walaupun dalam masa yang singkat. Generasi Z mempunyai hubungan positif dengan teknologi dan amat berpengaruh dalam dunia digital. Generasi lain mungkin kekok untuk memahami Internet dan sukar untuk mencapai jutaan orang di sebabkan kekangan bahasa, tetapi jangan terperanjat jika Generasi Z mungkin boleh melihat peluang menggunakan bahasa ibunda untuk kepentingan mereka. Saban hari terdengar, duta, ikon atau orang yang berpengaruh di kalangan Generasi Z yang banyak muncul dalam Internet dalam membina perniagaan pada umur yang sangat muda. Ramai di antara mereka sudah mempunyai rangkaian jualan pakaian atau menjadi ikon dalam perkongsian maklumat masakan dan hobi. Malahan, ada di kalangan mereka juga sudah mempunyai akaun sosial yang amat popular dan menjangkau ribuan malahan jutaan pengikut. Pengetahuan usahawan digital amat penting kepada Generasi Z. Malah segelintir mereka telah pun menapak kukuh dalam dunia digital - dunia yang bakal menjadi sangat berpengaruh dan berkesan iaitu dunia maya yang sama hebat seperti dunia fizikal (realiti). Ada yang sudah mampu mengembangkan hobi dan minat mereka sebagai satu perniagaan atau mencipta karier sendiri seperti ikon sosial media. Generasi Z boleh mengenal pasti diri mereka selaras dengan ikon yang mewakili minat dan nilai yang sama dan mereka lebih cenderung membeli barangan yang direka cipta oleh pencipta yang mereka minati. Para peniaga serta kerajaan perlu sedar bahawa pada masa hadapan nanti, Generasi Z bakal menentukan perniagaan digital sama ada sebagai pembeli atau usahawan digital muda yang mampu mencoraki tren perniagaan yang kreatif dan inovatif. Justeru itu, sekiranya Generasi Z ingin berkomunikasi dan berinteraksi, perkara pertama yang difikirkan oleh mereka adalah telefon pintar.

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PENGARUH PENGGUNAAN TEKNOLOGI DALAM PENGURUSAN

Oleh Mohd Rusyduddin Mat Nawi

Perkembangan dunia teknologi masa kini banyak merubah warna-warna kehidupan. Ia bukan hanya mempengaruhi negara luar sahaja namun turut berkembang pesat di dalam negara kita yang tercinta. Dahulu hanya segelintir pihak sahaja yang mampu menggunakan teknologi tetapi sekarang hampir segenap lapisan masyarakat tahu menggunakan teknologi terkini terutamanya telefon pintar. Telefon hanya digunakan sebagai alat telekomunikasi sahaja pada masa dahulu tetapi peranannya kini telah berubah menjadi lebih mirip kepada kemudahan sebuah komputer kecil. Idea pembangunan telefon telah melalui beberapa fasa yang berbeza. Penciptaan awal telefon oleh Alexander Graham Bell hingga kepada revolusi telefon pintar yang dicetuskan oleh Steve Jobs telah menjadikan beliau seorang pelopor perubahan telefon yang sangat ketara melalui produk yang dikenali sebagai *Apple*. Perkembangan telefon pintar ini sebenarnya seiring dengan teknologi-teknologi lain seperti teknologi pemotoran, teknologi kesihatan, teknologi peperangan dan sebagainya. Persoalannya adakah kita bersedia menerima perubahan-perubahan lain yang mana mungkin boleh mempengaruhi setiap urusan terutama sekali dalam bidang pengurusan.

Terpalit dengan perubahan teknologi dalam berkomunikasi, corak pengurusan juga turut sama menerima kesan teknologi yang sedang berlaku. Menurut Tabrani (1996), sesebuah organisasi seharusnya mempunyai rantaian komunikasi yang erat daripada pengurusan atas ke bawah dan yang jelas, kecekapan dalam berkomunikasi amat penting untuk memastikan kejayaan sesebuah organisasi. Idea-idea dalam buku pengurusan perlu ditambah nilai dengan kepesatan teknologi seiring dengan perubahan zaman. Pada masa dahulu kemunculan teknologi mungkin hanya membantu pihak pengurus mentadbir organisasi secara tidak ketara tetapi sekarang pengurus perlu melengkapkan pengetahuan dengan ilmu teknologi masa terkini. Menurut Donnelly et al (1987), kita mempelajari pengurusan atas dua sebab penting: pertama masyarakat hari ini sangat bergantung pada organisasi dan institusi untuk menyediakan produk dan perkhidmatan keperluan harian. Kebergantungan masyarakat kepada kepada pengeluar sebenarnya memberi satu implikasi sosial secara tidak langsung. Applikasi-aplikasi seperti Shopee, Lazada dan sebagainya telah mengambil peranan peniaga-peniaga konvensional. Keperluan dan kehendak masyarakat yang berubah setiap masa menyebabkan pengurus perlu bersedia untuk menjadi pengawal bukan sahaja kepada pekerja tetapi kepada sistem. Kedua, individu yang tidak dilatih sebagai pengurus sering kali terikat dengan keputusan pengurusan. Sarjana-sarjana pengurusan perlu melengkapkan diri dengan ilmu teknologi terkini bagi meningkatkan kapasiti dalam membuat keputusan.

Ilmu "*soft skills*" yang jitu perlu dididik dalam diri pengurus baru. Ini kerana kelengkapan proses asimilasi terhadap pengguna teknologi memerlukan penerimaan secara holistik dan berdedikasi. Cakna ilmu tentang buruk dan baik sesuatu teknologi dapat dinilai oleh bakal-bakal pengurus supaya keputusan yang dikeluarkan dan diarahkan boleh memberi impak yang maksimum kepada organisasi terbabit. Dalam membina negara maju, peluang membangunkan idea baru perlu disemaikan bagi melahirkan bangsa digital dan ruang pencarian ilmu perlu diberi secara meluas. Penerimaan masyarakat masa kini terhadap tekonologi tidak lagi sama dengan masyarakat terdahulu. Terdapat kekangan dalam pendedahan terhadap ilmu teknologi pada masa dahulu namun kini teknologi baru ini mudah diakses bak cendawan selepas hujan. Terma-terma terhadap penggunaan ilmu digital juga perlu sentiasa dikemas kini selaras dengan kemunculan rangkaian-rangkaian teknologi yang baru. Ketinggalan dalam dunia teknologi terutama dalam bidang rangkaian teknologi komunikasi mungkin melambatkan kita menjadi bangsa digital.

Generasi celik teknologi dalam perkembangan lingkungan dunia digital masa kini merupakan satu cabaran kepada pihak pengurus yang masih mengamalkan pengurusan dengan cara lama. Kebanyakan generasi baru adalah generasi celik teknologi. Kepakaran penggunaan teknologi hanya di hujung jari dan tidak mustahil setiap tindak tanduk yang dilakukan sukar dikawal oleh pengurus yang masih menggunakan cara lama dalam memastikan kelancaran organisasi. Pertembungan dua dunia yang berbeza ini boleh menyebabkan konflik dalaman yang serius. Justeru, pihak pengurusan atasan perlu memahami rentak baru dengan meningkatkan ilmu teknologi dalam penyeliaan pekerja-pekerja bawahan mereka yang merupakan generasi celik teknologi ini. Mengikuti latihan dan pembacaan ilmiah berkaitan teknologi terkini boleh membantu pengurus cara lama menerima perubahan kepada berasimilasi suasana kerja digital yang baru. Perkara seperti ini mampu menambah nilai pemantapan teknologi dalam jiwa pengurus terbabit.

Perancangan teliti amat penting dalam membuat sesuatu keputusan oleh pihak pengurus terhadap kakitangan di bawah seliaannya kerana ia turut memberi impak kepada pengurus itu sendiri. Tidak menjadi masalah jika masih terdapat cara lama yang ditambah baik seiring dengan perubahan semasa dalam penyeliaaan. Stephen H Goodman (2008) mendefinisikan pengurusan sebagai proses mentadbir dan koordinasi sumber secara cekap dan berkesan dalam usaha untuk mencapai objektif organisasi. Sedar atau tidak, kecekapan mentadbir dan koordinasi sumber datang dari pengetahuan jitu mengenai suasana yang dihadapi sekarang. Peter Drucker (1970) menyatakan bahawa tanpa pengurusan yang cekap, sumber pengeluaran sesuatu negara akan

menjadi sumber sahaja tanpa bertukar menjadi produk yang dapat dinikmati oleh rakyat. Namun, timbul permasalahan apabila kita sebagai konduktur tidak tahu bagaimana untuk melengkapkan elemen sedia ada yang bersesuaian dengan arus teknologi dunia semasa. Penggunaan teknologi bukan sahaja sebagai pelengkap tetapi merupakan elemen kerja penting dalam setiap organisasi. Pengurusan yang baik mengambil kira penggunaan teknologi yang sesuai dalam mengembangkan idea mereka.

Menurut Robert L Kartz (1974) terdapat tiga kemahiran asas yang diperlukan untuk mengurus dengan berkesan iaitu teknikal, sumber manusia dan konseptual. Dalam merencanakan kaedah pengurusan yang baik ketiga-tiga elemen terbabit perlu digabungkan sehingga membentuk acuan pengurusan yang baik. Mungkin ada kaedah-kaedah pengurusan yang digunakan berdasarkan "*command and order*" tetapi sebagai pengurus yang baik kita sendiri perlu melakukan kerja tersebut. Keadaan ini disebabkan setiap asas dalam penggunaan awal teknologi memerlukan latihan berterusan. Perubahan penggunaan mesin taip kepada komputer merupakan perkembangan teknologi yang memudahkan pengurusan dan mempercepatkan segala urusan. Sistem pengkomputeran yang telah diformat menghubungkan pemakluman yang lebih meluas dengan hanya menggunakan email sahaja. Tidak mustahil, pada masa akan datang tugas email diambil alih oleh aplikasi-aplikasi dalam telefon seperti "WhatsApp" dan "Telegram" bagi menyampaikan maklumat secara formal. Pilihan "WhatsApp" dan "Telegram" merupakan cara penyampaian maklumat yang cepat, mudah dan telah menjadi pilihan banyak pihak pengurusan di bahagian atasan dalam menyampaikan maklumat. Perkembangan teknologi ini memungkinkan urusan birokrasi dapat dikurangkan setelah sistem penyampaian maklumat semakin maju.

Masyarakat masa kini percaya, kemudahan teknologi hari ini memudahkan mereka mencapai segala maklumat yang kehendaki dengan pantas, tepat dan mudah. Maklumat di hujung jari menambah cabaran kepada pihak pengurus terutama bagi mereka yang terlibat secara langsung dengan masyarakat. Tindakan mereka dalam mengendalikan situasi begini amat memerlukan kesabaran yang tinggi. Tindakan pantas, cepat dan cekap ke atas beberapa perkara yang tidak diduga perlu dilakukan oleh mereka yang bergelar pengurus. Adakah bakal-bakal pengurus pada masa akan datang bersedia menghadapi cabaran kerja yang semakin mencabar?. Justeru, ilmu pengetahuan terkini, terutama ilmu yang berkaitan tentang teknologi perlu dipelajari oleh semua bakal pengurus kerana cabaran kerja yang dipelopori oleh teknologi bukan satu kerja yang mudah. Definisi pengurusan juga telah banyak berubah apabila dunia perniagaan alaf baru masa kini semakin bersandarkan dunia maya. Mungkin satu masa nanti peranan pengurusan semakin mengecil kerana ia telah diambil alih oleh teknologi. Apatah lagi, perkembangan A.I (Kecerdasan buatan) yang semakin maju memungkinkan segala urusan berkaitan kehidupan harian manusia diambil alih oleh robot. Sementara, itu setiap pekerjaan akan dikendalikan dan dilakukan oleh robot dengan pemantauan oleh pihak pengurusan organisasi.

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PENANG GEARING TOWARDS A SMART CITY

By Farzaana Haron

Have you ever wondered how would our lives be living in a smart city? A smart city is an urban area that uses communication technologies (ICT) as well as information to improve the life quality of city dwellers. The concept is simple whereby users are encouraged to explore available Apps as well as interacting with electronic devices spread out all over the city to enable them to efficiently access general public services such as transportation, library and many more. Let's look at Penang, a bustling Smart City in its earliest phase.

Imagine if you were in the city of Penang, and you need transport to commute around the city. As you walk by, you discover bicycles lined-up together where all you have to do is just making an online payment for the bicycle and you are able to unlock it immediately for your convenience. This is indeed a reality now thanks to LinkBike, a bike sharing system (BSS). The LinkBike apps are available in Google Play and App Store for bike users to download. Users would scan the QR Code to release the bicycles. Other than paying online, a new

LinkBike card system was also recently introduced. Its director Ken Yeoh said "The LinkBike card is for those who prefer not to use mobile apps," during the card launching ceremony by Minister of Finance Lim Guan Eng at Light Cafe in Jalan Padang Kota Lama in Penang on Sunday, 28th May 2017. The card works by simply swiping it on the scanner machine to release the bike.

The bike system is not the only thing that is gearing Penang towards becoming a Smart City. Penang has also created a Penang digital library. The physical library is situated in Jalan Masjid Negeri, Georgetown, and is opened for business 24 hours a day. Tablets are set up on the study tables where readers can access over 3000 e-books, e-magazines and reference journals, made possible by the app ReadCasa, downloadable through App Store and Google Play. On 27th January 2019, Y.A.B Tuan Chow Kon Yew, Chief Minister of Pulau Pinang launched phase 2 of Penang Digital Library.

Now let's imagine a less happy situation, for an example a case of a flood. Imagine if there is a way to alert people on the incoming flood situation as soon as possible. Now that is possible, thanks to Penang Alert, an app downloadable through Google Play and App Store. The Penang Alert app will give a warning on an upcoming storm, as well as giving reports of the flood as it happens. The source of data is from the Department of Irrigation and Drainage Malaysia and Department of Meteorology Malaysia. The fact that these two departments are collaborating in giving timely information to Penang City Council, where the latter created the app that would save lives, is a good example of how the move towards becoming a Smart City is an effort that we should all be proud of.

Penang Intelligent and Traffic System (PiTTs) is another app, downloadable through Google Play and App Store, that makes travelling around Penang more convenient for the public. The app will show the shortest way to reach any destination in Penang. In addition, it will also suggest which bus to take to reach the desired destination. The app also displays the latest events happening around Penang so that the public will be informed and maybe take an interest in the event. Users of this app are also able to lodge a complaint about any traffic problems they encountered on the road. According to the Minister of Finance Lim Guan Eng, the smart application PiTTs (Penang Intelligent Traffic and Transport System) will be able to integrate the traffic system with public transportation such as buses and taxis in Penang.

One may think, how about concerns relating to the trash in Penang? A Penang Smart City would not be very attractive if it is not kept clean and beautiful at all times. This is where

Smart Monitoring System (SMS) by Seberang Perai Municipal Council comes in. The app made available in Google Play and App Store enables the user to report cases of illegal trash dumping, uncut grass, dead trees as well as sewage problems. The app will update users about whether actions have been taken to resolve the issue. SMS was officially launched by the Minister of Finance Lim Guan Eng on 3rd January 2013 and integrated with MPSP Watch and Better Penang.

When we think about Penang, we cannot avoid thinking about its traffic and roads. Now, with the app Better Penang, downloadable through Google Play and App Store, users are able to lodge a complaint about a faulty traffic light. The way it works is by snapping a picture of the problem using the app, then tag MPPP or MPSP, followed by clicking the submit button, and the information will be posted on the Facebook page of MPSP Watch, MPPP Watch and Better Penang. Released in 2013, the mayor of Seberang Perai city in Penang monitors the complaints and ensures that complaints are responded to by the appointed task-force team.

Most house tenants would worry about Aedes, a mosquito responsible for spreading dengue fever, chikungunya, Zika fever, Mayaro, yellow fever viruses, and other diseases. Aedes is known to have white markings on its legs and thrives in tropical, subtropical and temperate regions, such as Malaysia, and in this case, Penang. The Crush Aedes Totally (CAT) is artificial intelligence (AI)-driven predictive system that will inform the state Health Department of its prediction so that the department will be able to send teams and prevent a dengue outbreak, said Aime Healthcare Sdn Bhd director Dr Helmi Zakariah. The programme, which started on 18th January 2018, is a collaboration between Aime Healthcare and the Penang government to reduce dengue cases in the state. Finance Minister Lim Guan Eng, said that "We are the first state in Malaysia to implement this programme and we are willing to share all our information with the Health Ministry".

Last but not least, saving the best for last, is an app close to the heart, AppSejahtera, an innovative welfare application for older people, single mother, handicap people (OKU), golden child, golden student and golden mother. Finance Minister Lim Guan Eng said "The state government started the 'i-Sejahtera' system in 2009 to facilitate recovery, updating and data collection in the distribution of funds", during the launching of the "AppSejahtera" application in Komtar on 25th June 2016.

Like everything else, there are pros and cons to a smart city. The pros would be the convenience of users to get information and services with just a flick of a finger on the apps or electronic devices. On the other hand, when everyone is on their mobile phones nowadays either interacting with an app, looking for information or chatting with people through an app, they tend to neglect the people around them. A smart city where its inhabitants are busy at looking screens instead of interacting with each other will possibly be less vibrant and lack of a harmonious atmosphere and a sense togetherness.

So, what is next for Penang in moving forward as a full bloom Smart City? Penang LRT project is expected to begin next year. According to Chief Minister Chow Kon Yeow, the Komtar-Bayan Lepas Light Rail Transit (LRT) project, part of Penang's Transport Master Plan (PTMP), will take between six to eight years to be completed. With the upcoming addition of LRT, we can be assured that the interaction between human and machine will turn Penang into the Smart City that it envisioned.

As we read about all the digital improvisations assimilated into the everyday lifestyle of the city of Penang, we cannot help to wonder if this trend will keep going on to the next phase or will stop in its track and dies prematurely. We also wonder if this idea of Penang Smart City will encourage other states in Malaysia to follow suit. The idea of a digital nation, or as Penang Malaysia introduced it, the Smart City, is an idea worth exploring. The benefits in term of convenience brought by the digital nation will not only enable people to move around the city easier easily and get notifications of any weather forecasting but also allow people to feel more involved in caring for the society especially by participating in various welfare activities. In conclusion, a digital nation, or a Smart City, will place people into an era of efficiency that boosts their morale leading to a better societal life.

References

[1] Cavina Lim (2018, February 3). High-tech system to combat dengue. Retrieved from https://www.thestar.com.my/ metro/metro-news/2018/02/03/hightech-system-to-combat-dengue/

[2] (2016, August 1). AppSejahtera makes it easy for Penangites. Retrieved from https://www.buletinmutiara.com/appsejahtera-makes-it-easy-for-penangites/

[3] Medha Basu (2016, March 2). How do they fare? Govt complaints apps compared. Retrieved from https://govinsider.asia/innovation/how-do-they-fare-govt-complaints-apps-compared/

[4] Smart Monitoring System (SMS). Retrieved from https://www.worldurbancampaign. org/smart-monitoring-system-sms

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BRANDING MALAYSIA AS A GLOBAL HIGHER EDUCATION HUB IN THE DIGITAL ERA

By Long Fei & Lewis Cardenas

International higher education is booming as a result of the emerging middle class. In developing countries, particularly in Asia, inbound international student numbers have grown dramatically. According to UNESCO, the number of international students grew from 2.1 million in 2000 to 5.1 million in 2017. By 2025, it is estimated that there will be more than 8 million students studying outside of their home countries.

Although historically, Asia was known to have some of the best universities in the world, it has been the primary income and talent source market for higher education institutions of Western countries. With the economic expansion of the Asia Pacific region, new collective efforts like the Silk Road Initiative, and an overall positive political outlook, many Asian countries are proactively transforming and promoting their higher education systems. The main objective, like Western countries, is to capitalise on its growing student populations and the economic, social and political benefits that naturally come with being recognised as a hub for international higher education.

As more new players join in the game, the competition for recruiting international students becomes increasingly fierce. To stay competitive, many Asian countries must apply extensive marketing strategies and campaigns to maintain the momentum for attaining foreign students.

Malaysia is a perfect example of a "new" study destination. In 2018, the country successfully attracted around 130,110 international students to its various types of tertiary education institutions. With the growing interest in Malaysia as a study centre comes the rise in the global reputation of Malaysian universities. All the 5 research universities have shown remarkable improvement in the QS world university ranking in the last 5 years. According to the Malaysia Education Blueprint 2015-2025, the country aims to become a global higher education hub with more than 250,000 international students by 2025.

Although Malaysia has experienced significant growth, its Asian neighbours are also catching up with the same ambitious goal of becoming a global education destination. Countries like China aim to attain 500,000 international students by 2020; Japan has its sights set on 300,000 international students by 2020, and South Korea is targeting

200,000 international students by 2023. There are already 492,185 enrolled foreign students in Chinese universities and colleges, which makes China the top study destination in Asia. China's 2020 goals are within reach.

The new dynamics of global higher education has made branding extremely important. All study destination countries are sending out massive information to prospective students which creates much "noise" in the higher education space. Without a unique and favourable

brand, a study destination may easily be drowned by its competitors. Besides, students would conduct online research for opportunities to study abroad, comparing different destinations, universities and programs. Given the increasing popularity of using the internet to choose a study destination, online branding becomes an essential tool and asset.

According to Studyportals, an online education choice platform based in the Netherlands, Gen Y and Gen Z populations are technology-savvy and self-independent, which set a higher requirement for branding activities on cyberspace. These two generational cohorts rely heavily on internet channels for study information. These mediums include search engines, university websites, student chat portals, and social media platforms.

Two decades ago, Malaysia noticed the growing importance of online channels affecting the study choice of potential international students. Therefore, it launched a couple of online platforms (e.g. www.educationmalaysia.gov.my) to promote its higher education and provide necessary study information. This plays a significant role in branding Malaysia as a higher education hub of high quality and affordable cost.

According to an official document released by the former Ministry of Higher Education, Malaysia should enhance its student recruitments by focusing on emerging markets in Asia, particularly the Middle East, Central Asia and China. In 2018, the top 3 sending countries for Malaysia tertiary education were Bangladesh, China, and Nigeria. Interestingly, the number of Bangladeshi students was over 30,000, which is more than the combination of those from China and Nigeria. Meanwhile, other major global source markets and targeted key markets, such as India, South Korea, Saudi Arabia and Central Asian countries, are not even in the top 10 list indicating a disconnect with Malaysia's national branding strategy in these countries.

Undoubtedly cost is an influential factor when perspective international students choose where to study, but its effect may vary for different students, especially for those from higher income countries. Besides, it is known that a cheap price can scare off customers in the consumption area, which also translates to the higher education sector. For some extent, it seems Malaysia has put too much emphasis on a lower price for its value proposition. In the section of WHY MALAYSIA at www.educationmalaysia.gov.my, 4 main reasons/advantages are listed, but 2 of them are focusing on affordability, which may induce to a misperception that Malaysia is only suitable for students with limited financial resources.

Take India for example, it supplies 553 thousand students to international higher education annually, accounting for over 10% of world foreign student population. Meanwhile, only 1,500 of them are currently studying in Malaysia. At the same time, there are more than 8,500 Indian students in the Philippines where is currently less known in the world education arena. India and Bangladesh are both listed as low-middle income countries by the World Bank. Logically, students from the two countries should place importance on cost equally when they decide where to study, but why there is such a tremendous difference in students' enrollment numbers in Malaysia? What are the reasons behind and how to figure them out?

At an international conference held in Kuala Lumpur this year (APAIE2019), Mr Vytautas Rimkus, a senior advisor of Studyportals, mentioned that big data has become very important for universities targeting the right perspective candidates by solving some decision making "puzzles". Studyportals found that students from the same country have different demands on higher education based on aggregated online data. Thus, it is suggested that Malaysia should modify value propositions of its national branding strategy in accordance with diverse demands from different target markets, and Malaysia should decide the core values that are the most appealing (e.g. quality, affordability, international reputation, or calibre of excellence) when it comes to promotion in a particular country market.

Regarding big data as a tool for analysis, it is important to note that its application is still relatively new in higher education. Besides infrastructure, there are other barriers to use big data in an efficient way, such as lack of expertise and difficulty of integrating data from a variety of sources. The requirements of big data already exceed the scope of traditional data analysis in quantity and quality. Therefore, specialised talents should be introduced to the national branding team of Malaysia, and those experts need to discover a feasible method to collect and integrate a massive amount of structured and unstructured data for a better understanding on characteristics of international students in proper market segmentation.

Making the ultimate choice of deciding where to study involves a very complicated decision-making process. Apart from issues pertinent to core values of higher education, a positive country image is essential for branding and attracting prospective students. It is gratifying to know that major online platforms are presenting Malaysia as a multicultural, peaceful and progressive nation. This will help foreign students in forming a favourable perception of Malaysia's higher education system. Considering the growing interest in Malaysia, more discussions and research should be conducted for deeper insights on how Malaysia as a higher education hub will impact all sectors of the economy.

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PROJEK MBA MENYANTUNI MASYARAKAT

Oleh Ida Rosnita Ismail

Umum mengetahui bahawa program Sarjana Pengurusan Pentadbiran, atau lebih dikenali sebagai MBA (*Master in Business Administration*), disasarkan kepada pembangunan kerjaya seseorang pekerja. Program ini dapat membantu pekerja untuk mendapat ilmu pengetahuan berkaitan pentadbiran perniagaan, membina kompetensi sebagai bakal pengurus atau pemimpin yang berwibawa, dan memperluaskan jaringan kerjasama dengan pelbagai golongan profesional.

Meski pun program MBA banyak ditawarkan di institusi pengajian tinggi di seluruh Malaysia, *UKM-Graduate School of Business* (UKM-GSB) yang merupakan salah sebuah fakulti di Universiti Kebangsaan Malaysia, menawarkan nilai tambah unik menerusi projek MBA. Ianya merupakan kursus wajib yang perlu dipenuhi oleh pelajar-pelajar MBA sebelum mereka bergraduat. Tujuan projek MBA ini diadakan adalah untuk memupuk budaya menyantuni masyarakat dalam konteks tanggungjawab sosial korporat (*corporate social responsibility* atau CSR). Setiap pelajar yang mengikuti program MBA sudah pastinya akan memperoleh ilmu yang lebih baik di dalam kelas tetapi tidak semestinya mereka memahami keperluan masyarakat di luar kelas. Dengan adanya projek MBA ini, pelajar-pelajar di UKM-GSB bakal menjadi pengurus dan pemimpin yang cemerlang dan mempunyai nilai kemanusiaan dan kemasyarakatan yang tinggi bagi memacu kesejahteraan bangsa Malaysia dalam mengharungi cabaran semasa.

Semester 2 sesi akademik 2018/2019 memperlihatkan pelbagai projek telah dilaksanakan dengan tujuan khusus yang memberi manfaat kepada pelbagai lapisan masyarakat. Projek-projek ini telah menghimpun pelajar-pelajar MBA dan pensyarah-pensyarah UKM-GSB, rakan-rakan industri, ahli-ahli politik dan orang ramai dalam situasi muafakat dan harmoni. Apa yang lebih membanggakan adalah program-program ini telah mendapat liputan media yang memberangsangkan, dan justeru menaikkan nama pelbagai pihak yang terlibat dalam projek-projek yang dilaksanakan. Berikut adalah ringkasan beberapa projek MBA yang telah dilaksanakan bagi semester pengajian ini:

Alam sekitar merupakan sumber tidak ternilai buat seluruh kehidupan di dunia ini. Menyedari kepentingan penjagaan alam sekitar, kumpula yang diberi nama *Eco Warrior* telah menganjurkan satu aktiviti yang dikenali sebagai *plogging* bertempat di Taman Botanikal Ayer Keroh Melaka pada 30 Jun 2019. Menurut ketua projek, Yamunah Palaniyandi, aktiviti ini mampu mewujudkan kesedaran pentingnya memelihara alam sekitar dalam kalangan masyarakat. Peserta-peserta yang mendaftar untuk aktiviti *plogging* diberikan satu beg plastik sampah dan sarung tangan sebelum acara bermula. Mereka dikehendaki berjalan atau berlari-lari anak sambil mengutip sampah. Prohtam ini telah dirasmikan oleh Datuk Tey Kok Kiew, Exco Perumahan, Kerajaan Tempatan, Persekitaran dan Teknologi Hijau Melaka. Pelbagai pihak telah memberikan kerjasama bagi menjayakan aktiviti ini, iaitu SWCorp Melaka, Majlis Perbandaraan Hang Tuah Jaya, SWM Environment Sdn Bhd, Jabatan Perhutanan Melaka, Jabatan Alam Sekitar, Fraser & Neave Holdings Bhd., GBA Global Corporations, JomRun, MarathonMY dan Ultron.

Program "Ride For Love" merupakan program kayuhan berbasikal yang dianjurkan oleh kumpulan pelajar MBA UKM-GSB dikenali sebagai *Attitude*. Program amal ini merupakan program usahasama diantara Sekolah Kebangsaan Sungai Lui dan Parlimen Hulu Langat telah dijalankan pada 6 Julai 2019. Objektif utama pogram ini adalah untuk mengeratkan lagi ukhwah diantara masyarakat setempat. Aktiviti yang telah dijalankan ialah kayuhan dari SK Lui Hulu Langat ke Genting Peras, Pertandingan Mewarna, Bola Sepak 4 Penjuru dan Membina Menara Spegeti. Perasmian penutup program telah disempurnakan oleh YB Datuk Haji Hasanuddin bin Mohd Yunus, Ahli Parlimen Hulu Langat P101. Seramai 500 pengunjung telah hadir untuk bersama-sama memeriahkan aktiviti yang telah disediakan. Menurut ketua projek, Yuana binti Iwan, pelbagai pihak telah tampil memberi sumbangan kepada mereka. Antaranya adalah Parlimen Hulu Langat, MPH Printing, Zedya Sdn Bhd, Zumail Global Enterprise, dan Koperasi Melayu Petaling Berhad (KOPETA).

Tiada seorang pun akan terpinggir. Begitulah hasrat yang diketengahkan oleh sekumpulan pelajar yang dikenali sebagai *Caring Souls* dan diketuai oleh Muhammad Neshan bin Muhammad Hafiz Ramish. Kumpulan ini telah mengadakan pertandingan *E-Sports* di UKM-GSB pada 29 Jun 2019 dalam usaha menjana sumbangan kewangan untuk disalurkan kepada badan kebajikan bukan kerajaan, *DICM Home*, bagi membantu kanak-kanak yang kurang berkemampuan, ditinggalkan dan terpinggir di rumah kebajikan tersebut. Sebanyak RM10,000 telah disumbangkan kepada badan ini menerusi Ketua Pegawai Eksekutif DCIM, Encik Khalid Hashim pada acara ini. Turut memeriahkan acara adalah Saudara Kathiereswaran a/l Sugumaran, iaitu Juara FIFA 18 Malaysia. Menurut Muhammad Neshan, aktiviti ini juga merupakan usaha kumpulan ini untuk mempromosikan sukan atas talian yang kini menjadi trend di Malaysia. Sumbangan diterima daripada pelbagai pihak termasuk Lian Heng Tyres and Service Centre, Da Yuen Machinery Hardware Trading, Yong Tai Lie Auto Company, Mun Hong Filing Station, Foo Lee Furniture Trading, AZ Auto Garage, dan orang perseorangan yang bermurah hati menyumbang kepada *Caring Souls* dalam menjayakan usaha murni ini.

Pada 22 Jun 2019 bertempat di Surau Abdul Rahman Auf, Seksyen 3 Bandar Baru Bangi Selangor, telah berlangsung majlis pelancaran dan ramah mesra *KTU Online* yang diusahakan oleh sekumpulan pelajar dikenali sebagai *The Achievers*. Menurut ketua projek tersebut, Saudara Azlan Azim bin Azali, tujuan projek ini dijalankan adalah untuk membangunkan sistem bayaran yuran dan sumbangan atas talian yang mudah, efisien dan selamat untuk pelajar-pelajar luar kemampuan di Kelas Tahfiz Ummah, Bandar Baru Bangi. Majlis ini turut dihadiri oleh YB Tuan Haji Mazwan bin Johar, ADUN Sg. Ramal, selain Prof. Dato' Dr Imran Ho bin Abdullah yang merupakan Timbalan Naib Canselor Hal Ehwal Jaringan Industri dan Masyarakat UKM dan Tuan Haji Abd Rahman bin Yasin mewakili pengurusan Kelas Tahfiz Ummah. Sumbangan turut diperolehi daripada Dazlan Energy Sdn Bhd dan Globegas Engineering Sdn Bhd.

Tidak semua manusia bernasib baik. Pelarian Rohingya yang diberi perlindungan di Malaysia merupakan golongan yang memerlukan perhatian sewajarnya. Kumpulan pelajar yang diberi nama AURORAs telah melaksanakan satu projek masyarakat bertempat di Sekolah Komuniti Rohingya (*Rohingya Community School*) di Cheras yang bertujuan menyediakan persekitaran pembelajaran kondusif kepada kanak-kanak ini. Selain itu, ianya juga bertujuan memberi bantuan kewangan kepada *Malaysian Relief Agency* untuk menyalurkan bantuan kepada mereka yang memerlukan dan meningkatkan kesedaran orang ramai tentang isu yang dialami oleh kanak-kanak pelarian Rohingya. Sumbangan sebanyak RM5,000 telah diserahkan kepada *Malaysian Relief Agency* pada 1 Julai 2019. Selain sumbangan orang ramai, L'Oréal Malaysia Sdn Bhd, Jatun Paints Malaysia Sdn Bhd, BMS Medical Sdn Bhd, dan TL Corporate Services Sdn Bhd turut menyumbang kepada program ini.

Kumpulan *The Bridge Society* yang diketuai oleh Steven Gan Chee Liang memilih untuk menjalankan projek yang bertujuan memupuk kesedaran dalam kalangan masyarakat Orang Asli teruatamanya kanak-kanak tentang kepentingan pendidikan. Projek ini telah dijalankan selama dua hari, iaitu pada 1 dan 2 Jun 2019 di Kampung Orang Asli Sungai Melut, Sepang. Program ini turut dijayakan oleh Shopee Mobile Malaysia dan Chettinad Spices Restaurant.

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What's up with WhatsApp?

By Norhafizah Abu Hasan

Nowadays, the flow of information in organisations is very fast. Today's workforce needs to be digitally competent, innovative, and well prepared in order to thrive in a digital economy. In the era of Industrial 4.0, talented employees in the workforce need to be IT savvy in their communication skills. Employees are expected to know how to transmit information electronically and thus the skill of preparing effective digital messages has become essential. That said, employees in business organisations need to be ready, available and alert with updates or instructions from top management, superior, or even their colleagues.

Mobile communication using smartphones is one of the prevailing technological trends today. Smartphones are no longer a need but necessities. With smartphones, more communication apps are available in either Google play-store or Apple app-store. Business communication today is taking advantage of a messenger application that is very effective and yet cheap such as Facebook, Telegram, WhatsApp, Viber, Mystic, and WeChat. Most people use them in their daily communications and Malaysia has the highest WhatsApp (WA) messenger users in the world. The popularity of WA messenger group has increased tremendously to the extent that it has been used not only as personal communication among family members and friends but also as an important communication tool in most organisations.

The mobile revolution through smartphone has changed the way people communicate in business organisations and also the way the organisation managed talented employees. From government sectors to small-and-medium-enterprises, WA messenger groups are widely used to manage people, team and groups. Some organisations use the WA group messenger as a formal business communication tool to make important announcements and to give job instructions. However, there are some pros and cons in using WA messenger application especially WA messenger groups in organisations. WA messenger application has been found to be widely used in Malaysian organisations. From a business communication point of view, WA messenger group is an efficient and fast communication tool. There are many advantages of WA group messenger for organisations. First, information can be sent to many receivers simultaneously. Second, it is inexpensive and hence widely used in Malaysia. Third, since smartphones follow employees wherever they go, faster feedback is received through WA messenger communication than via e-mail. In addition to the above advantages, the fourth advantage is that users may share and transfer pictures, audio, files, word documents via WA messenger. Furthermore, users can also share their current location with other group members. Lastly, the announcement sent via WA messenger reaches more people and faster as compared to email, posters or memo.

Small-and-medium enterprises benefit most from using WA messenger application in their daily business communication. In a normal business organisational structure, all departments would have their own WA groups for conducting efficient discussions. In addition, most of the time, managers would give instruction in the organisation main group WA. This situation has created a new work culture whereby employees need to always check their WA messenger whenever there are incoming messages. This new culture of checking WA messenger seems to negatively affect employees' productivity. How do we make sure that employees only check the organisation's WA group messenger? Is checking personal WA group considered unethical at work?

Most employees have a variety of WA groups to manage in their smartphones. That includes their personal WA group like family, alumni, friends, neighbourhood, hobby or any other interest group and even WA group with their children's class teacher or children's caretaker. It is interesting to note that in a recent round table discussion with the Millennial employees regarding the future of works, one respondent shared her thought that the current practice for employees to get updates on their children via WA messenger at work represents a new perspective of work-life balance. Given that emergencies related to children are sometimes informed through WA messenger, access to WA messenger at work is a blessing. Hence, the claim that checking personal WA group messenger during office hours is unethical may not be valid in a digitally advanced economy.

As Malaysia is on its way to becoming a digital nation, the new working culture of relying on WA messenger should be encouraged. Given the increasing number of WA groups to manage, the effectiveness of WA messenger as a business communication tool would deteriorate in line with employees' productivity if no proper guidelines are available. Employees' work-life balance would be negatively affected if the habits of checking WA messenger groups are brought home. A recent study has found that with the increased number of WA groups in an employee's smartphone, employees tend to check personal WA groups even during office hours. Since many important announcements and discussions are done using the WA group messenger, most employees also always check their smartphones even at home. Such new habits negatively influence employees work-life balance.

Time for families and friends should be used wisely. WA messenger groups solely used for work purposes should not be activated after working hours. The past exploratory study found that job instructions given via the WA messenger group after working hours or during the weekend are not acceptable although this situation is happening in most organisations.

The following are some suggestions for organisations to achieve efficient communication via WA messenger application. First, WA groups created should have their own rules and guidelines especially the large WA group for the organisation. Important note for the business organisation's WA group is that superior should not give instruction to a specific employee using the main organisation WA group because the instruction might not reach the specific individual. Instead, the superior should message the instruction directly to the specific employee. Second, all members should understand the intention of creating the group. They must be aware that the organisation WA group is a formal group and no other non-work related information should be posted in that WA group. No sales promotion or religious reminders (i.e.*tazkeerah*) should be posted in the WA group for WA group with a large number of members (i.e. the whole organisational members are in that WA group).

However, the main challenge to all employees and employer is how to manage all the WA groups in the smartphones. Employees' values may guide them in using the WA group messenger properly in line with organisational goals. The act of chatting, gossiping or shopping in other informal WA groups during office hours are considered unethical.

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SHARING IS CARING? THINK AGAIN!
By Suria Fadhillah Md Pauzi & Ida Rosnita Ismail

Have you ever been in a situation whereby you see something went wrong and you wanted to share it with the whole world? Snapped a picture, wrote a caption and posted it in your Facebook or Instagram, or even shared it with a WhatsApp group. For example, cases like bullying at school, traffic offence on the road, employee misbehaviour at the workplace, and rude treatment received from a front desk person at a hotel? True, it is common to do so. A majority of us keep on sharing information over the Internet when something goes wrong. The intention is almost always benevolent, not malicious.

It is easier to share this kind of information with the whole world now because we are blessed with advanced gadgets, especially smartphones. According to Datareportal in its Digital 2019 report, there are 3.256 billion mobile social media users as of January 2019. This organization that provides data, insights and trends on digital technology also reported that people in Malaysia spend an average of eight hours and five minutes per day to access the Internet. Although it seems that such sharing is common and justified, only a few understand the legal liability behind this sharing behaviour.

When sharing information, one must always be careful of the defamation trap. Defamation is a statement or an act which if it is made, may expose a person in the eyes of the public to contempt, hatred or ridicule and eventually cause him to be shunned by the public. In Malaysia, the law of defamation is governed by the Defamation Act 1957 (Act 286). This law governs all civil cases on defamation whereas criminal libel is governed by the Malaysian Penal Code under section 499 and section 500.

Interestingly, there is no definition of the meaning of defamation in Act 286. However, what constitutes defamation can be inferred from the decisions of the courts in various cases. It includes an attack upon the moral character of a person attributing crime, dishonesty, untruthfulness, ingratitude or cruelty[1]. The test for defamatory statement is "*whether the words complained of were calculated to expose him to hatred, ridicule or contempt in the mind of a reasonable man or would tend to lower the plaintiff in the estimation of right-thinking members of society generally*"[2]. Not all cases involving defamatory will be treated similarly. The extent to which an act or a statement that tend to lower a person's reputation depends on the facts in each case and its effect on the individual concerns. If a word is spoken in jest, it is not considered defamation. The reason is simply that words should not affect a person's reputation.

A defamatory statement can be classified as libel or slander. Libel refers to defamation in a permanent and visible form such as defamatory articles published in a newspaper,

visual images or e-mail, which has the tendency to lower a person's reputation in the estimation of right-thinking men or cause him to be ridiculed or shunned by others. In this situation, libel is actionable per se. There is no need for a person to prove that he has suffered any loss or injury because of the published statement. On the contrary, slander is defamation in a temporary form such as words spoken and gestures. Unlike libel, slander requires proof of actual damage. However, Section 3 in Act 286 specifies that radio broadcasting where defamatory words are communicated is considered as a permanent form of defamation; hence, it is a libel, not slander.

How do you prove that a defamatory statement has been made? Under the Malaysian law, a defamatory statement can be proven if (i) the words are defamatory, (ii) the words refer to the plaintiff, and (iii) the words have been published[3]. *What does it mean by defamatory words?* The words must have a tendency to lower the estimation of the person in the mind of right-thinking members of society generally which as a result exposed the person to be shunned, ridiculed or hatred. The defamatory words can be assessed by looking at its natural and ordinary meaning, or by virtue of inferences or special facts known by the reader of the words or better known as innuendo. For example, a defamatory statement such as "*That guy who just received the company's top award actually got his way to win our boss' heart, if you know what I mean*" is assumed when it refers to an employee, who recently received an excellence award from the company, to have bribe his employer. Defamatory words are also anticipated through juxtaposition. For example, when a person employs visual effects or placing another person's photograph in a pile of a wanted criminal.

To what extent should the defamatory word refer to a person? It is easier to establish a defamatory statement when a person's name is mentioned but what if no name is mentioned? In this instance, it is sufficient to establish a defamatory statement is made against a person if its description identifies a person even if his name is not mentioned. Sometimes, a person does not intend to refer to a specific another person. Perhaps, there are two persons by the same name and only one is referred to as "*the bad guy*". Although the statement is made about the first person, the second person can take legal action against the person who made the defamatory statement when his community believes that he is the bad guy[4].

What does it mean by defamatory statement must be published? A statement is considered to have been published when the defendant communicates it to anyone other than the person being defamed or his/her spouse. That is, the defamatory words must be disseminated to a third party, other than the person being defamed. If a person writes

a defamatory statement about a person he intended to defame and sends it only to that person to read, then it does not constitute publication for the purpose of a defamation suit. Similarly, a confrontation between the two persons in a closed room whereby one person spoke a defamatory statement to another person, it will not be considered as being published.

With the advent of technology, various types of Internet-based platform such as Instagram and Facebook are likely to be a platform to disseminate defamatory statements. Section 2 in Act 286 defines "word" as to include pictures, visual images, gestures and other methods of signifying meaning. However, there is a number of issues to be addressed with before a person is said to have defamed others on the internet such as the issue of anonymity and authorship, jurisdiction and enforcement and the liability of internet service provider.

In Malaysia, besides the Defamation Act 1957, Communication and Multimedia Act 1998 (Act 588) was enacted to regulate issues pertaining to online publication and statement. In addition to these Acts, it is also important to examine Section 90A of the Evidence Act 1950 (Act 56), which provides for the admissibility of documents produced by a computer. Among others, Section 90A (1) in Act 56 provides that a document produced by a computer, or a statement contained in such document, shall be admissible as evidence of any fact stated therein if the document was produced by the computer in the course of its ordinary use, whether or not the person tendering the same is the maker of such document or statement.

Various court cases have proven that it is easier to disseminate defamatory information on the Internet. Online activities such as blogging and posting false information on Facebook as well as in Instagram are susceptible to defamation. Similarly, an inflammatory e-mail that is intended to communicate to the public about a person's assumed wrong-doing can be considered as a defamatory statement.

Towards building Malaysia as a digital nation, all citizens must be aware of and be mindful in sharing information online. As recommended by the Chairman of the Communications and Multimedia Contents Forum (CMCF), everyone should practice the 3R before sharing any information online – research, responsibility, and report[5]. Do not fall into the defamation trap! Sharing is caring but sharing can also become a liability.

References:
[1] Syed Husin Ali v. Syarikat Perchetakan Utusan Melayu Berhad & Anor [1973] 2 MLJ 56

[2] Tun Datuk Patinggi Hj Abdul Rahman Ya'kub v. Bre Sdn Bhd & Ors [1996] 1 MLJ 393

[3] Kian Lup Construction v Hong Kong Malaysia Bhd [2002] 7 CLJ 32

[4] Newstead v. London Express Newspaper Ltd [1939] 4 All ER 319

[5] Berita Harian Online (8 March 2018). Amal 3R sebelum sebar maklumat di media sosial. https://www.bharian. com. my/berita/nasional/2018/03/397326/amal-3r-sebelum- sebar-maklumat-di-media-sosial

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INDUSTRY 4.0: REVOLUTION ON CORPORATE GOVERNANCE?

By Ng Suat Thing & Mohd Hasimi Yaacob

The First Industrial Revolution began at the end of the eighteenth century and early nineteenth century, which introduced the use of mechanical manufacturing system utilising water and steam power. The Second Industrial Revolution symbolised by mass production through the use of electrical energy in the late nineteenth century, in the middle of the twentieth century. The Third Industrial Revolution further, accelerated automation using electronics and information technology, and now manufacturing has been on the brink of the Fourth Industrial Revolution [Figure 1].
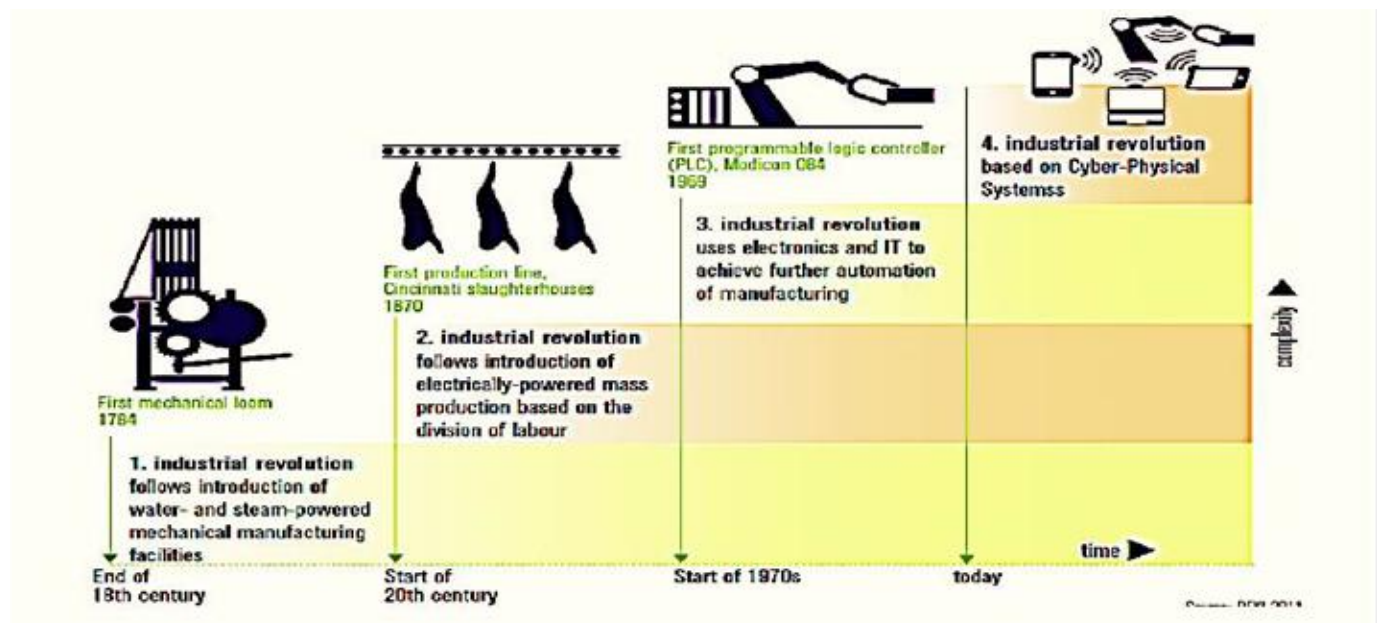

Figure 1: The Revolution from Industry 1.0 to Industry 4.0
(Sources: Veza, Mladineo and Peko, 2015)

Technology plays a vital role in the 21st century, which contributes significantly to world development. Technology has radically driven political, economic, social-cultural and environmental into the new burst of evolution. Nowadays, Industry 4.0 (IR4.0) has a substantial influence on the manufacturing industry. IR4.0 is defined as the revolution of industries towards fourth-stage of industrialisation. The term of IR4.0 was manifested at Germany Hannover Fair in 2011[1]. Afterwards, it gains attention from all over the world to adopt this concept. Alternatively, IR4.0 is called smart manufacturing, smart products, or industrial internet and is mainly dependent on the use of Cyber-Physical Systems (CPS), the Internet of Things (IoT), and Cloud Computing. The integration of IR4.0 will bring interconnection with man to man, man to machine, machine to machine or service to service. Thus, IR4.0 will have impacts on traditional methods of industrial production as well as corporate governance such as business regulation.

The Importance of Industry 4.0 Adoption in Malaysia

IR4.0 is a recent phenomenon in developed and developing countries, including Malaysia. It has become a necessity all over the globe to adopt IR4.0 since the world revolves into a fierce global competitive environment day by day. In Malaysia, Electrical and Electronic (E&E) industry are one of the significant sectors under the review of the 11th Malaysia plan (2016-2020). It has been a significant contributor to the nation's economy. E&E industry attracted the highest amount of foreign investments, which was RM8.2 billion, or 84.5% in 2017 (MIDA, 2019). However, Prime Minister Tun Dr Mahathir pointed out, if manufacturing firms continue to rely on the traditional method which is capital and labour as productivity levels, they will no longer reap the same yields as in previous decades. He further stated that smart manufacturing would eventually lead to the emergence of smart cities, smart grids, and smart services in Malaysia. IR4.0 is the key to increasing competitiveness and sustainability for businesses. This era of increased digitization can add an estimated RM41.67 billion to Malaysia's gross domestic product (GDP)[2]. These denote the importance of IR4.0 adoption in Malaysia.

Corporate Governance in Industry 4.0 Era

In the CFA institute publication, corporate governance is described as "the system of internal controls and procedures by which individual companies are managed. It provides a framework that defines the rights, roles and responsibilities within an organization. As its core, corporate governance is the arrangement of checks, balances, and incentives a company needs in order to minimize and manage the conflicting interest between insider and external shareowners."[3]

There are many weaknesses in the corporate governance of the twentieth century to date. 1Malaysia Development Berhad (1MDB) scandal is the best example of weaknesses in corporate governance, which is known as earning management[4] caused by information asymmetry[5]. A study conducted by MACC in 2011, further discovered that corruption in one of Malaysia's enforcement agencies had caused an estimated "RM108 billion" of potential revenue missing every year, and "RM10 billion" were illegally transferred abroad. Corporate governance remains unsolvable weaknesses. Consequently, it creates an opportunity to further adoption of the technology mechanism to improve and solve these weaknesses.

IR4.0 adoption will bring a revolution to corporate governance in terms of increasing the effectiveness and efficiency of organizations. There are various applied technologies in industry 4.0, including Internet of Things (IoT) and Cloud Computing. IoT enabled by smart devices design-making is capable of integrating devices, organizations and information systems for data sharing and exchange, real-time monitoring, and can be used anytime and anywhere to sense, capture, measure and transfer data; Cloud computing allows anyone to upload a large volume of data and share with others who then provide effective solutions to problems such as inefficient data exchange and sharing, low productivity, and less optimal utilisation of manufacturing resources. Therefore, it is necessary to adopt IR4.0 as the applied technology will be able to solve problems in corporate governance.

Challenges of the Firms in Industry 4.0 Adoption

IR4.0 is considered as a new concept. It requires a few years to realise IR4.0 as it is not as smooth sailing to achieve it. Numerous challenges and difficulties will be faced by corporations and industries in the process of implementing IR4.0. The challenges can be grouped into scientific challenges, technological challenges, economic challenges, social problems, and political issues. In this article, we mainly discuss some of the challenges regarding corporate or industry. The explanation below shows a brief example of these challenges:

1. Organizational transformation
   To pursue the novel industrial paradigm shift, hierarchical structures of a corporation needs to be more flexible and adaptive. The transformational processes will constitute an agile corporate culture. Since IR4.0 is about connectivity, it is essential to involve all stakeholders in a business to take a joint action to drive organizational transformation.

2. Data security
   Managers are concerned about the risk of falling victims to cybercrime, unauthorized information access, industrial spying, and the open connection of data exchange among all players in the value chain, including vertical and horizontal value chain.

3. Competitive rivalry
   Companies predict an increase in rivalry due to the changes in competitive environments. On another note, small and medium- sized enterprises face the challenges in order to remain competitive against established large businesses and a potential oligopoly of platform providers. In addition, shifting industry boundaries facilitate the market entrance

of new companies into the industry. Therefore, novel business areas and industry's concentration on IR4.0 will shift market equilibrium and toughen the competition.

4. Financial resources and profitability
   To implement and achieve IR4.0 requires high cost and investment into technology development, improved skill workers and stronger data security for organizations. For example, Panasonic Group (Malaysia) has spent RM300m in adopting IR4.0 in 2019. However, the profitability of IR4.0 implementation is still uncertain from a present-day perspective. Therefore, we can conclude that this is a high risk with an uncertain return on investment.

5. Collaboration between human resources to achieve customer orientation market
   From the viewpoint of customer orientation, there is a need to understanding specific customer requirements due to increasing collaboration and involvement. Then companies will translate customer demand into effective solutions comprising modular combinations of hardware and software. Henceforth, employees require adequate training and development approaches to achieve the qualification for process planning and coordination responsibilities. On the other hand, it will also create another issue on long term loyalty of the employee against the background of the shortage of skilled workers.

[1] Ghobakhloo, M., 2018. The future of manufacturing industry: a strategic roadmap toward Industry 4.0. *Journal of Manufacturing Technology Management*, 29(6), pp.910-936.

[2] Malaymail., 2018. Embracing automation to build a sustainable future- Sakari Kuikka. https://www.malaymail.com/news/what-you-think/2018/11/08/embracing-automation-to-build-a-sustainable-future-sakari-kuikka/1691289

[3] Schweser Notes, CFA Level 1 Book 4, 2018

[4] Earning management is the use of accounting technique to produce financial reports that present an overly positive view of a company's business activities and financial position; it also defined as the act of intentionally influencing the process of financial reporting to obtain some private gain.

[5] Information asymmetry occurs when one party to an economic transaction possesses greater material knowledge than the other party.

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MALAYSIA: ERA OF DIGITAL ECONOMY THROUGH STRATEGIC BUSINESS AND MARKETING

By Norulhuda Tajuddin & Mawar Ayuni Mohd Mokhtar

We live to satisfy our own needs and wants. Unfortunately, needs and wants are unlimited. That is the economic concept which leads to the business ecosystem. Businessmen make money as they offer products and services to satisfy people's needs and wants. Barter system applied when people exchange their valuable items in order to get another item to satisfy their needs and wants. People shift to use gold and silver as a medium of exchange to the commodities. As business evolves over the years, people are more receptive to use paper or fiat money as currency in their transactions. This evolution in the trading system also changes the marketing strategy adopted by the companies.

The power of the Internet and the World Wide Web has a significant impact on marketing strategy. Traditionally, businessmen are familiar with face-to-face marketing including persuasion, a call-out to catch attention; pricing strategy like a discount, purchase with purchase; advertisement such as printed flyer, signboard, newspaper, magazine, even television and radio are among popular approaches adopted by the marketer.

Now, with the Internet, businessmen have more leverage in marketing strategy. E-mall, for example, is the platform for various online sellers to sell their products and services, managed and administered by one big online business company such as Shopee.com and Lazada.com. Managing a website can be very costly but with Shopee.com everyone can be involved in online business and thus, paves the way for advertisement evolution for a young and small business start-up with less capital. More sellers join the e-mall and lead to bigger e-mall which turns as competitive advantage factor.

BENEFITS OF DIGITAL MARKETING

Advertisement Evolution

Interestingly, all the traditional approach of marketing strategy can be converted into online marketing. We may not hear the voice of call-out by the seller on the website but, the digital blinking icon can easily catch our eyes that lead us to the website. Same goes to pop-up advertisements that somehow lead us to click the advertisement unintentionally as it appears at the strategic finger position at the phone screen. The E-mall website not only making money based on the transaction counts per day but also through advertisement. Lazada.com offers advertisement space at a reasonable price to the sellers so that they can increase their sales. Comparing to the television or radio advertisement, website advertisement will cost less and more manageable. A small start-up business can manage their marketing cost because Lazada.com also provides marketing-related incentives to ensure a win-win situation for both parties.

Customers Access to Information

Online sellers have more space and time to provide more content and information about the product or services offered. Traditionally people recommend their preferred products through word of mouth and surprisingly, we also can do it online. It is so easy for the customer to recommend the products to their family members and friends because they just need to click the share button. Upon their recommendation, they will be rewarded with points accordingly. We may think that persuasion works best on personal marketing but online business is also able to persuade people to buy. Now, we can communicate with the sellers through chat service as customers generally prefer to chat with the sellers to get the information even though all information is already provided. Without a doubt, the customers still prefer human touch even though they don't meet the sellers physically because it is relatively easier to ask directly for information rather than reading it.

Customers Testimonial

Additionally, an online business also provides rating star and customer's review. Both of these functions have a significant influence on a customer's purchasing decision. Customers read comments and reviews prior to purchase to guide their decisions before clicking the buy button. Genuine comments are really helpful to provide more information about the products or services such as materials used, quality, size, colour or even the taste. The most important thing is for the previous customers to provide a review of the credibility of the online seller to meet the expectation. Not only that, but they also provide reviews on the seller's personality such as friendly, kind-hearted, and even the online availability in

responding to queries. Meanwhile, the rating star allows the customer to rate the product or service quality. It is based on the scale of five stars which later will be averaged out and ranked from highly recommended (5 stars) to poorly recommended (1 star). Both rating stars and customers' reviews serve to influence a customer's judgment before the purchase. Poor rating and the adverse comment will definitely give a negative impact to the seller.

Shopping with Comfort

For the customers, the shopping experience is no longer a hassle where they struggle to park their cars, get stuck with the crowd, or hurry up to get " catch the price promotion during the year-end sale". Offline shopping can cost more for customers as they may spend more on food items, parking tickets, and also due to impulse buying. Impulse buying is when customers buy unplanned items. Sellers purposely placed certain items at strategic locations, especially at the checkout counter. Online business, on the other hand, offers such a distinguishable shopping experience. Customers can take time to read on products' information, browsing related products, make products comparison in their pyjamas as long as they are connected to the Internet. It is also easy to make payment with many secured online payment gateway providers such as PayPal, Stripe, and E-pay. Indeed, now customers no longer buy from a local website but also able to shop globally. The online payment gateway providers not only are accepted worldwide as a method of transaction but also features the option of processing customer's preferred currency which is subject to exchange rate**.

DOWNSIDE OF DIGITAL MARKETING

Overspending

Despite the advantages offered by online business, the disadvantages of this phenomenon are also prevalent. When everything is digitalised, customers are blown away by the sophisticated marketing strategy which instead of making us wiser in making a purchase decision, it sometimes turns us blind. The convenience of shopping, better pricing and more selection, and even the incentive and add-on sales leads the customers to overspend. Add-on sales, for example, encourage the customer to add a few more items in their shopping carts so that they may reach certain value to receive the points. It is very easy for customers to get trapped as they may feel that they are losing an opportunity to get the best value of money if they do not do. This is especially true when they just need to spend a few more ringgits to get the additional items. After collecting certain points, customers may feel the urge to redeem the points that lead further to unwanted shopping especially during free time. At first, they may just browse the items but eventually end up buying online due to the convenience factor. Customers have a high tendency to buy unnecessary items instead of buying the necessities to satisfy their needs.

Misleading Testimonials

Approved testimonials by customers to influence others on their purchase decision may also result in the wrong buying decisions. Items such as health supplements and beauty products are not supposedly purchased based on testimonials. Customers may face health risk in believing

certain testimonials; for example, in buying beauty products that promise flawless or whiter skin based on what they perceive as a definition of beauty. Health supplements and beauty products usually formulated with some chemical-based substances that may have side effects such as allergies, infections, and hormone imbalances. It should be a common understanding that taking chemical or drug-related substances should be prescribed by a physician just like we buy pharmaceutical products. However, some irresponsible manufacturers influence their customers to buy the product based on testimonials by previous customers who actually get paid to do it.

Online advertisement can also be too good to be true. Some photos and videos for advertisement are edited to be more saleable. For example, video advertisements for a burger can be so mouthwatering with appetizing colour, enlarged size, and sound effect to complete the image of a pleasant burger. However, when they buy the burger it is so far away from the expectation. The same goes to the models for traditional festivity attires advertisements such as on Eid, Chinese New Year and Deepavali. They are usually edited to look tall and lean in order to set the minds of viewers with the idea they will turn to be pretty as well by wearing the same attire. On the other hand, traditional customers can check the product quality based on sight, touch and smell to carefully choose the best product. In this situation, online purchase may result in the customers' dissatisfaction and frustration.

In line with the rapid growth of modern technology, it is undeniable that both traditional and online business holds an important role to strengthen all types of industries. The physical shop should at least have an Instagram account or Facebook. Meanwhile, pure online business may expand the business to have a physical outlet. Therefore, the act of selling and buying is not only to satisfy the needs and wants of an individual but also to achieve overall shopping experience satisfaction. This is just the beginning to endless creative marketing strategy and business opportunity for future experiences.

** Van Puyveld, M., Kedzlie, I., George, S., Macari, P., Lloyd, D.P., Blagden, B., Oberoi-Morris, C., Prabhune, A.A. and Connolly, P., Mastercard International Inc, 2019. *Online transaction infrastructure and processes*. U.S. Patent Application 16/136,726.

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TOWARDS A DIGITALISED NATION: CHALLENGES, PREPARATIONS AND BENEFITS

By Mark Cyril Fancis

The approach to digital technology is poised to be the new driver of the development of a nation and has become a priority in many sectors such as banking, tourism and education. The role of digital technology has become an important issue for everyone to debate about the impact on our society by considering the challenges that may occur before it can be implemented nationwide. Therefore, the involvement of the government and the people of Malaysia is important in making the preparations for Malaysia to continue progressing in its development path in order to achieve the goal of transforming Malaysia into becoming a digitalised nation.

The Internet plays an important role in the implementation of digital technology for society because that approach will not happen without the existence of excellent service of internet network coverage. The Malaysian Communications and Multimedia Commission (MCMC) had conducted a survey in 2018 to get the data on the number of internet users in Malaysia. The survey had determined that the percentage of internet users in Malaysia in 2018 stood at 87.4% which is an increase of 10.5% percentage point from 76.9% in 2016, and approximately there were 28.7 million Internet users in 2018 which is 4.2 million more users in comparison with the 24.5 million users in 2016. Based on The MCMC 2018 survey report, smartphone remained as the main device being used by the society to access the internet where nine out of

ten internet users used a smartphone (93.1%) to go online. Meanwhile, the use of fixed and home-based devices such as smart TV and game console had steadily increased over the past few years. However, the Speedtest Global Index reported that Malaysia was ranked at 81 out of 133 countries in March 2019 for the mobile internet speed with an average speed of 20.49 Mbps. This is an issue that the government has to be concerned with because the effectiveness of digital technology implementation relies on internet speed. The fast internet speed may increase the effectiveness in delivering information through the internet. Moreover, the trading activities between business owners and their online customers will become more efficient and secure.

In addition, business owners in Malaysia must be ready for the implementation of online services in order to grow their companies because some people tend to shop online. The online shopping services have given the people so many advantages due to its time savings since the only resource that can rival money today is time. Furthermore, one of the reasons people prefer online shopping is that they can review and compare dozens of stores and products at one time. Savvy online shoppers simply can navigate from one webpage to the next for comparing the stores without requiring them to travel to various stores. They can do it all online by only clicking the search button on the webpage to search for the products and read reviews, compare

prices, qualities and customer services before purchasing the product they want to buy. In fact, many shoppers use a hybrid shopping system where they visit a physical store to determine exactly what they want and then they will search online for better pricing. This is particularly true in the category such as clothing, where the buyers will visit a physical store with the intention to touch, feel and try on the product. However, they will eventually find the exact product they want by surfing the internet to find a website that can offer them the best price.

In the education sector, the implementation and approach of digital technology are important because today's students are 'digital natives' brought up in a world of high technology where smartphones, high-speed Wi-Fi and technology are on-demand since numerous things have been digitalised. In line with the rest of modern society, students are used to sophisticated imagery and instant access to valuable resources; and this shows that digital communications have a role to play at all touchpoints through the university experience. Before getting enrolled at a university, prospective students will visit the main website and probably engage with social media programmes and digital signage for information to help their decision-making in choosing a university based on the criteria they desire in terms of university's profile, the field of study, location of the campus and the fees. Hence, the technological infrastructure within a university will be a key differentiator for today's students since technology is a key part of their daily activities where they require modern and digitally driven campuses to attract them. Furthermore, prospective students will always have questions in mind about all areas of student life such as financial information, living arrangements, campus navigation, transportation, course delivery and, perhaps most importantly, the social functions and events available. Effective and informative technology systems will be crucial for delivering this information in a digestible and engaging manner. Having made the decision to attend a particular university, this level of information delivery will continue to be of utmost importance.

Whilst students have high technological expectations, teaching staff are also encouraged to get used to the implementation of the digital technological approach in the scope of works on their own journey of digital transformation by incorporating technology into their teaching skills. Any university that does not supply the technological tools that the lecturers need to deliver their lectures will lose talent and will be left behind by those who do. The creation of an app that contains the required information such as a timetable for lectures and examinations, is necessary between students, lecturers and the non-academic staff because

this level of communication will help to engage students with campus life and deliver a holistic university experience that is most attractive to each student's needs. The apps will not only allow students to interact but also encourage conversation between staff and the student body and thus, building a sense of community and brand advocacy for the university. Hence, they can be brand advocates for the university after graduating by being active in alumni groups and interacting within the social networks. Besides, smart technology and advocacy for innovation are some of the methods for higher education establishments to stand out against their competitors and also helpful to gain additional revenue streams for the universities, rather than relying on government funding. Consequently, an infrastructure of effective digital communications must be prepared because it will also allow universities to get involved in commercial relationships with relevant brands for campus life, and help the financial needs for the required technology solutions.

In conclusion, these factors have shown that the implementation of digital technology is important and has many advantages in preparing Malaysia to become a fully digitalised nation in the future for further development of the economy, education and other sectors as well. For this reason, all parties that consist of the government, society and the Non-government organizations (NGOs) must play their roles in improving the areas that slow down the growth of the digital technology in our country. Furthermore, the government must also encourage young Malaysians to explore and gain more knowledge in the high digital technology invention from all over the world in order to improve what Malaysia currently has in its own country. Relevant programmes that consist of scholarship and research funds must be available for the Malaysian to grow their talents in this field of knowledge.

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NATURALLY DIGITAL: THE BIG DATA OF NATURE

By Norfarhan Mohd Assaad & Rahmad Akhbar

One most often associates nature with, plants, animals, or geographic topologies (rivers, lakes, oceans and etc.). This "traditional" association, however, is changing very rapidly in particular for modern-day life scientists. Thanks to the Next Generation Sequencing technology (NGS) and since the completion of the Human Genome Project in 2003, biological data, in the form of DNA/protein sequences, continues to grow at an unprecedented pace. To appreciate the sheer scale of the data coming out of the life science field, let us use the internet as a measuring stick. It was estimated that up to the year 2016 the internet accumulates a total of 7.7 zettabytes of data. If you are not familiar with the unit zettabyte, in numbers one zetta is a factor of 1021, in words, a zettabyte is one thousand billion bytes. Now, in 2016 alone, the number of DNA (bases) was pushing 13 quadrillions, a factor of 1015 or in words one thousand trillion bases. Bearing in mind that the estimate for the DNA bases is only a one-year estimate, whereas, the estimate for the internet data bytes is a cumulative estimate since the 90s, one can easily recognize the grandness of the data coming out of biology and life science in general. Nature is big data.
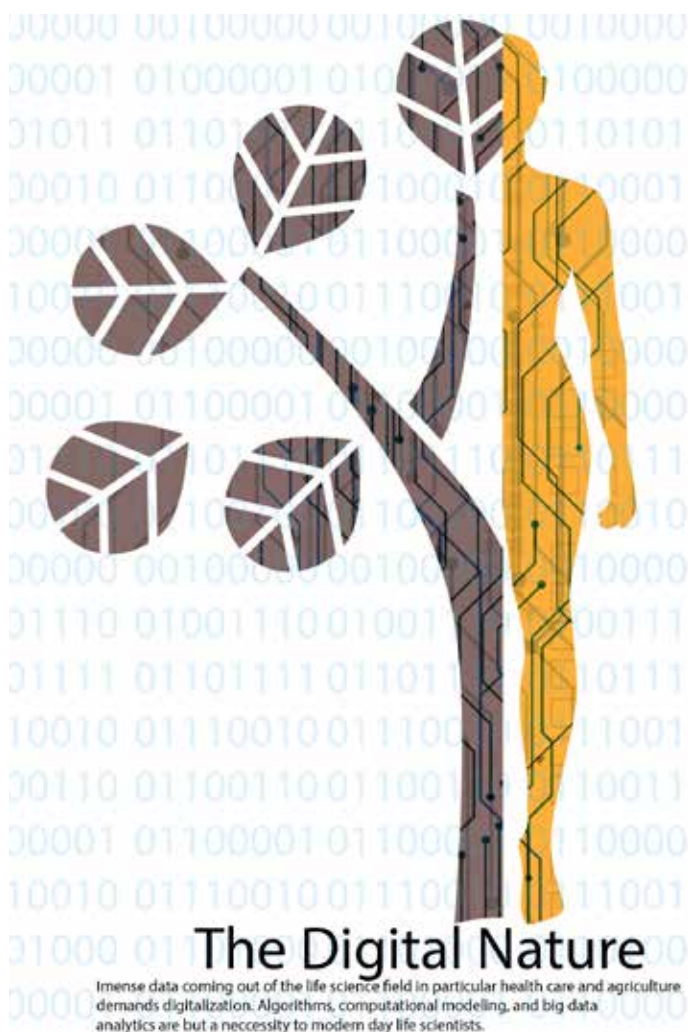
With big data comes big responsibility...and opportunity. Well, the original quotes actually go like this: "with great power comes great responsibility" but today, data is almost equivalent to power and power provides opportunities. Massive corporations such as Google and Facebook centre their products and services around data retrieval and, more importantly, data analytics. We are going to share (what now is) a typical online experience. We needed new parts for our bicycles (yes we admit that as scientists we tend to have nerdy personalities but we do go out there to bike and socialize with other humans–smiley). As anyone would, we went to our web browser to look for these parts and bought it online. A couple of days later, when browsing unrelated things, one of the advertisements that the browser displayed to us was an ad for a bike shop. As we spend more and more time online, we notice that the browser (or more precisely the corporation behind this browser, Google) "understand" our behaviour better and better. What is amazing about this is the fact that this "understanding" is achieved largely via big data analytics. Typically, these corporations employ a class of techniques known as Deep Learning. A deep learning model is trained on a massive amount of user data allowing it to make tailored and accurate predictions for each user. The phrase artificial intelligence (AI) is often used to describe this type of systems to the general public.

For us life scientists, understanding what advertisement to serve to a particular user may not be of interest. But, questions such as what treatment to give to a patient given his/her previous medical history or what DNA changes (mutation) associated with the survival of a virus (pathogen) can be framed in a similar if not identical fashion to the advertisement problem. That is, we can **deep learn nature** just as we **deep learn user data from the internet**. For example, using deep feed-forward neural networks (a type of deep learning algorithm) Akbar and colleagues identified cavities on the surface of proteins that may potentially influence the way these proteins deliver their functions within cells. Mohd Assaad and colleagues demonstrated the potency of high-throughput sequencing (NGS, big biology data) in identifying genetic changes (polymorphisms) associated with the fitness and survival of plant pathogens.

Importantly for Malaysia and the neighbouring Southeast Asian nations, big data thrives in the agriculture sector. For instance, a collaboration between technology giants such as Fujitsu, a financial corporation ORIX, and agricultural corporations Masuda Seed and Smart Agriculture Iwata in Japan gave rise to a smart farming program that leverages on technology to yield superior produce. Specifically, the smart farming program uses connected-sensors to manage and manipulate the farming conditions. On broader terms, these connected-sensors are a part of a larger family of connected devices known conceptually as the Internet of Things (IoT). In practice, these connected devices collect a huge amount of data which is then used to train deep learning algorithms (or any other model) to optimize the farming conditions. A similar collaboration between Fujitsu and Aeon Agri Create was implemented in Vietnam as well. Japan is obviously a high-income country but the country never took its eyes off agriculture. Surprisingly for Malaysia, where agriculture is still one of the core economic activities, there has been very little buzz over smart farming. REDtone, Malaysian telecommunication and digital infrastructure provider, listed IoT based farming on its website but the details remain sparse. Further, we have yet to see serious initiatives aimed specifically to digitize the nation's agriculture sector from the government or industry alike.

Health care is another major sector undergoing a revolution in the age of big data. Companies such as 23andMe which attracted big money (and data-hungry) investor such as Google, illustrates this quite nicely. Here is a little snippet we took from the 23andMe website:

"You are made of cells. And the cells in your body have 23 pairs of chromosomes. Your chromosomes are made of DNA, which can tell you a lot about you. Explore your 23 pairs today. Find out what your 23 pairs of chromosomes can tell you."

The Digital Nature

Imense data coming out of the life science field in particular health care and agriculture demands digitalization. Algorithms, computational modeling, and big data analytics are but a neccessity to modern day life scientists.

We must admit the allure of knowing everything about ourselves just from our DNA sequences is quite powerful if not sirenical. When we did our Bachelor of Science degrees at Universiti Kebangsaan Malaysia (UKM) in 2007, we experimented with but a tiny fraction of DNA and we were extremely excited about it. Today you can get your entire genome sequenced and analyzed albeit by (data hungry) corporations. The data from personal genome sequencing opens a plethora of opportunities. Chief among them is personalized and precision medicine. In personalized

medicine, therapeutic and preventive cares leverage the patient's genetic information and combine it with big data analytic techniques such as deep learning algorithms to come up with a therapy most suitable to the patient. Not too dissimilar to the "what advertisement to serve for this user" problem described earlier.

When there is light there must be a shadow. Stories of the digital revolution in life science do not always end beautifully. The meteoric rise and fall of Theranos, a Silicon Valley-based company infamously known for its lab-on-chip blood testing technology, remind us that the digital dream can deprive even the best of us from our senses. There is also a matter of privacy in data management and collection. Much like the heated discussion surrounding how to best handle privacy and user data on the internet, which manifested as the General Data Protection Regulation (GDPR) in the European Union (EU) and has been in effect since May 2018, similar or even stronger arguments must be weighted when the genetic data of the planet is at stake.

Although we only briefly discuss two sectors: agriculture and health care. It is enough to take us to the obvious question: are we, as a nation, ready for the digital nature? From our perspective as scientists and academicians, ready or not, the digital nature is already here. Either we march forward with it or get left behind. Unfortunately, the academic sector (universities and research institutes) appears to still shy away from taking full advantage of big data analytics. From personal communications and observations, many of our life scientists remain anchored to legacy niche research areas and our students receive very little training on the increasingly important computational competence necessary to thrive in the era of digital nature. Do you think we are ready?

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GENERATING VALUE IN THE DIGITAL TRANSFORMATION OF THE SERVICES SECTOR FOR PUBLIC GOOD

By Husyairi Harunarashid

The familiarity with social media as channels for searching and consuming content with the high penetration of mobile communication, as a whole, is aggressively pushing a "democratisation movement" not only in the commercial space but also in the services sector for the public good, such as education and healthcare. With the dawn of "New Malaysia", the public is expected to be more vocal and demand greater accountability from the purveyors and stewards of critical public infrastructure. The digital transformation of the public sector is arguably inevitable, which in turn greatly impacts expectations of the kinds of service it provides, and the value the public receives from these important public services – perceived or real. There is a rise in public service consumerism, particularly in healthcare, both locally and globally. Expectedly more data and information are accessible to consumers – clients can make better decisions on where they want to be treated, how they want to be treated, and even by whom they want to be treated. This rise in expectations paradoxically is accompanied by the need to contain the rising cost of providing quality services in a timely manner, while being affordable to most individuals in society.

The way forward is to develop a strong public relations strategy, as well as an overarching reform effort to strengthen the core business of public institutions through the development of value creation ecosystems. Focusing on value rather than cost or outcome is likely the smarter way of addressing concerns of efficiency, expectations and above all safety and quality of the care we deliver as an organization. The advent of the Industrial Revolution 4.0 and its promises of hyper-connectivity and ubiquitous data-driven work culture is expected to drive the promised digital transformation. Technology will be the lynchpin of the public services sector; particularly in the way the potential of big data is harnessed to improve services. Getting the right kind of people, with the financial support for long term investment as well knowing exactly which kind of technology to prioritize for what problems need addressing first is the challenge. All this will take time, and patience with almost single-minded intense focus – to this end, any public service entity must strive to design a good strategic master plan and form the right dynamic teams to ensure the plan runs its course to completion.

Finding the pragmatic meaning of value

The polysemic nature of the concept of value creates its own set of challenges and opportunities when trying to translate it into meaningful outcomes, both at the policy planning level and its iterative implementation. Coupled with nuances in the colloquial meaning in the local language, the resultant diverse possibilities of understanding can cause misalignment and needless arguments amongst stakeholders and potential partners in the public sector.

It can be argued at a pragmatic level, the concept of value is primarily multi-dimensional and relative in nature. Unpacking value, such as in the following example, may provide a practical solution (Figure 1).
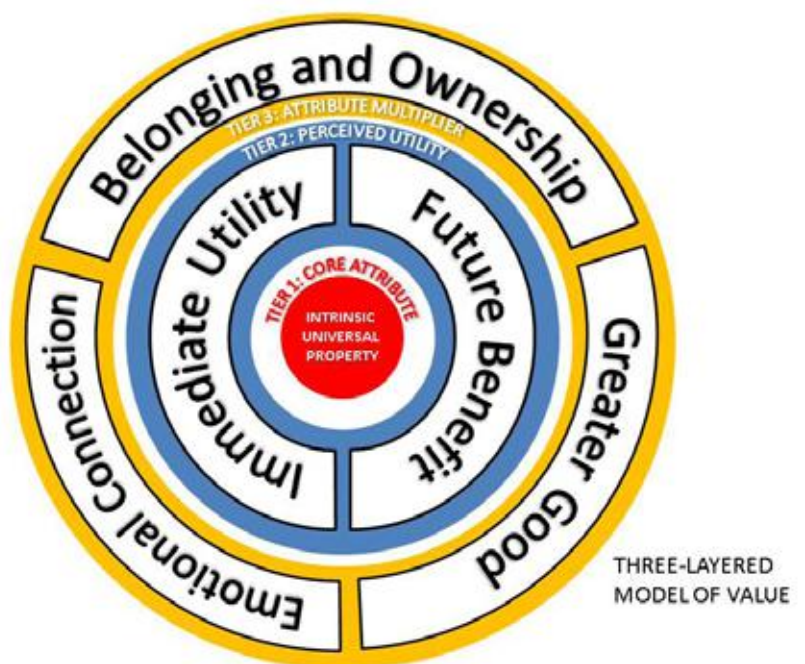

Figure 1: Multi-dimensional model of value

An entity, whether physical, virtual or conceptual, has an intrinsic core attribute that represents value to the observer. This universal property is a social construct, relevant to the unique socio-cultural situation of the observer. The most common denominator for this universal value is in the form of monetary value. This given value is usually a general consensus, accepted as a relative constant by the society under most circumstances. As an example, a 50 Ringgit note is universally accepted by anyone in the Malaysian society of having the cash value of 50 Ringgit, no more, no less.

The relative value of the 50 Ringgit note, however, can be drastically changed by the second dimension of value: its perceived utility. This is largely influenced by the relative need of the observer to the ability of the object in question, let say the 50 Ringgit note, to provide for the aforementioned need. This need may be immediate or fulfil part of a future need. If the object has little or no role in providing for immediate or future use, it could diminish its relative value to the observer quite significantly.

The next tier modifies the core attribute through a largely subjective multiplier effect. It is at this level arguably where the process of value creation works best. An object may be of small value from a monetary standpoint, but can be made to have such a significant impact on a person's life by linking it to an effect of creating greater good and having formed a strong emotional connection that it enhances the value of the object to the level far higher than just merely enhancing the object with expensive add-ons. Creating a sense of belonging and ownership to that object can also considerably enhance its value.

Strengthening the core

The provision of services for public good almost invariably creates natural monopolies within the various service sectors fully funded by the government of the day – such as the public school system, public universities, government hospitals and clinics. Competition is almost non-existent, or at least blissfully ignored. Privatisation may be one solution to inject innovation and efficiency in certain sectors, but not all services for the public good should be left to the machinations of market forces alone.

At its root, a public service organisation exists within a designated service delivery system: e.g. healthcare, primary education, sanitation, conservation. This system has in its core a primary intent. In the instance of a health system, its sole purpose is to promote, restore or maintain health. The system has also core values and principles which guides its activities; as well as clear goals it currently sets to achieve within a given time period.

In the frantic rush to commence transformational strategies and institutional reforms in embracing the Fourth Industrial Revolution, leadership of these public institutions must always refer to its core mission within the context of the system where it naturally belongs to, and be guided by the core values and principles which represents the system when carrying out change management plans. The goals of transformation must be clear, and always reflect the true founding goals of the institution so that it will always carry out its duties to provide services for the public good.

Invigorating the public sector talent pool

The stability and security as a government employee are appealing for many graduates both in the past and in the current times. Yet, these same traits can be very confining when it comes to establishing the right talent pool to move the digital transformation agenda in the public sector. Rigid human resource policies can potentially limit both the uptake of young, bright talent and the accelerated promotion of creative, high-performing employees to turnkey roles in the organisations. With this in mind, change management in the public service sector must include new innovative ways to create team-based rewards systems and a work environment that is fulfilling and rewarding to personal growth. Workforce empowerment must be included as one of the primary goals in transformation; where sophistication in the provision of future services must be planned with increased technical superiority and leadership of the service staff involved at all levels of the supply and value chain of the designated service.

Creating a Value Creation Ecosystem

The core business must first be strengthened, with a goal to provide better, faster and friendlier service within the limits of the finances available. Priorities must be made clear, and decisions must be made prudently, backed with evidence. Once this framework is established, all stakeholders and partners are identified and analysed based on commonalities from a value stream viewpoint.

The working example of reimagining the teaching hospital of the Faculty of Medicine, UKM is provided to illustrate this process. Hospital Universiti Kebangsaan Malaysia, as it was formerly known, is the third and final installation of publicly funded teaching hospitals in Malaysia. It is effectively a government statutory body, which is bound to the rules, regulations and work practices of the Malaysian civil service. In spirit, this institution is actually far older with its role as a teaching hospital being filled by the Kuala Lumpur General Hospital in the late 70s, before moving into the permanent premises of today. This historical tie to a prominent public hospital created a sense of duality of mission and purpose, which invariably colours its strengths and weaknesses. In the public eye, there is the notion of delivering accessible good healthcare for the people at large. On the flip side, there is the internal belief that the core mandate is to drive the education, training and talent production for the national healthcare workforce – particularly of doctors and clinical specialists. Driven by a national mandate, the Chancellor Tuanku Muhriz Hospital (HCTM) has focused its efforts on providing basic as well as tertiary healthcare services while assisting its medical school partner in providing the clinical education environment that it needs to carry out the tasks of educating the future generation of doctors, nurses and healthcare scientists. Conceptually, the Value Creation Ecosystem (VCE) of HCTM as a teaching hospital supports holistic value creation for all the identified 16 stakeholders;

creating value in three differentiated value chains: Patient care, Healthcare data and Health & wellbeing content (Figure 2). As a whole, the proposed VCE of HCTM promotes better outcomes of patient care through cost-effective care, the creation and maintenance of a strong evidence base for clinical decision making and an informed public of issues in health and wellbeing.
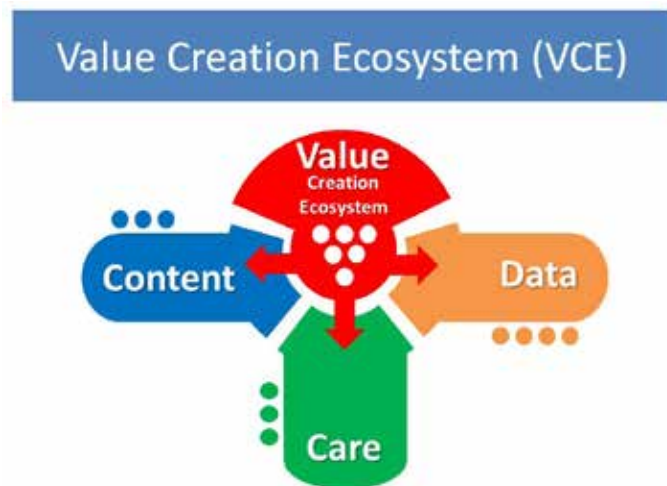

Figure 2: The proposed concept of HCTM Value Creation Ecosystem

In conclusion, the transformation of public organizations and government agencies must always strengthen the core goals of providing the unique designated services for the public good without sacrificing quality and yet be as cost-efficient and accountable as possible. The use of value creation ecosystem as a model for transformative change should be explored in the strategic planning for innovative growth in the public sector.

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UKM-GSB EARNS AACSB INTERNATIONAL ACCREDITATION

We are pleased to announce that UKM-Graduate School of Business (UKM-GSB) has earned AACSB International Accreditation. Founded in 1916, AACSB is the longest-serving global accrediting body for business schools, and the largest business education network connecting students, educators, and business worldwide.

"AACSB accreditation recognizes institutions that have demonstrated a focus on excellence in all areas, including teaching, research, curriculum development, and student learning", said Stephanie M. Bryant, executive vice president and chief accreditation officer of AACSB International.

UKM-GSB applauds its entire team – including the UKM's top management team, faculty members, support staff, students, alumni, and industry partners – for their supports and roles in earning the highest honor in business school accreditation.

"The AACSB accreditation is indispensable, especially for our students and faculty members", said Assoc. Prof. Dr Puan Yatim, Dean UKM-GSB. "It challenges us to pursue excellence in research and continuous improvement in our business education programs. It also allows us to show to employers and our strategic partners that our graduates are being prepared at the highest level for their roles as future leaders for the global marketplace and society".

UKM-GSB is very proud to be one of the 856 institutions across 56 countries and territories that have earned and maintained AACSB accreditation.