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THE INSTITUTION OF ENGINEERS, MALAYSIA
Bangunan Ingenieur, Lots 60 & 62, Jalan 52/4, P.O. Box 223, (Jalan Sultan), 46720 Petaling Jaya, Selangor Darul Ehsan.
Tel: 603-7968 4001/4002 Fax: 603-7957 7678
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+603 7493 1047
info@dimensionpublishing.com

Joseph How : +6011 1234 8181
Shirley Tham : +6016 283 3013

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Level 18-01-02, PJX-HM Shah Tower, No. 16A, Persiaran Barat,
46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia.
Tel: +(603) 7493 1049 Fax: +(603) 7493 1047
E-mail: info@dimensionpublishing.com
Website: www.dimensionpublishing.com

CHAIRMAN
ROBERT MEBRUER

CEO/PUBLISHER
PATRICK LEUNG

GENERAL MANAGER
SHIRLEY THAM • *shirley@dimensionpublishing.com*

HEAD OF MARKETING & BUSINESS DEVELOPMENT
JOSEPH HOW • *joseph@dimensionpublishing.com*

PRODUCTION EDITOR
TAN BEE HONG • *bee@dimensionpublishing.com*

CONTRIBUTING WRITERS
PUTRI ZANINA • *putri@dimensionpublishing.com*
LAURA LEE • *laura@dimensionpublishing.com*

SENIOR GRAPHIC DESIGNER
SUMATHI MANOKARAN • *sumathi@dimensionpublishing.com*

GRAPHIC DESIGNER
SOFIA • *sofia@dimensionpublishing.com*

ADVERTISING CONSULTANTS
THAM CHOON KIT • *ckit@dimensionpublishing.com*

ACCOUNTS CUM ADMIN EXECUTIVE
YEN YIN • *yenyin@dimensionpublishing.com*

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Chief Editor
THE INSTITUTION OF ENGINEERS, MALAYSIA (IEM)
Bangunan Ingenieur, Lots 60 & 62,
Jalan 52/4, P.O. Box 223 (Jalan Sultan),
46720 Petaling Jaya, Selangor.
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COVER NOTE

INNOVATE AND CREATE

by Ir. Rusnida Talib
Chairman, Women Engineers Section

"Continuous innovation is not easy and if you keep using the same method, you will experience diminishing results," said Paul Sloane, author of *The Leader's Guide to The Lateral Thinking Skills* and *The Innovative Leader.*

Mankind has always been curious about innovation. Some common questions about innovation: How to innovate? What to innovate? Why bother to innovate? Are innovators born or made?

An innovative mind is not just for the gifted few. Innovation allows us to compete in the global marketplace. To ignite and sustain innovation, we need people to experiment with many different things. It encourages the search for novel information and perspectives, leading to better decision making and problem-solving.

Globalisation means different things to different stakeholders. The culture of innovation does not happen by accident. It must be created, adopted and rewarded. Encouraging imagination and creativity increases innovation.

In this month's Cover Story, WE speaks to three women who share their experiences and views on innovation. They have shown their passion and innovation which have brought positive changes to their lives.

In line with this month's theme, WE suggests that we "Start with the End in Mind", "Learn, Unlearn and Relearn", "Clear the deck" and "Innovate for Change". Let us also not forget that we wish for unity in diversity and that together, we can strive for economic growth that is global, equitable and sustainable! Happy Merdeka! ■

EDITOR'S NOTE

AN EXCITING JOURNEY

by Ir. Dr Bhuvendhraa Rudrusamy
Bulletin Editor

This month's bulletin brings you "Innovation for Change". It also concludes my term as bulletin editor for *JURUTERA*. As part of editorial team, I'm happy to have produced the 8th issue of *JURUTERA* for 2020 and I have to say that it has been an exciting journey for me.

So many uncertainties, so many discussions, so many changes, and the dreaded coronavirus pandemic… all these are accommodated in the dynamics of this publication. I'm truly glad that the new norm "innovation" has kept us moving. And despite the huge responsibilities and commitment, I've truly enjoyed producing engaging issues of the bulletin. Thank you for all your support.

During the recent MCO, most of us had to stay at home to help in the fight against the Covid-19 pandemic. We are fortunate that we have almost resumed our regular activities, albeit with the new norm. Indeed, the MCO has given us a deeper understanding of the word "freedom" and I would like to take this opportunity to wish everyone Happy Merdeka! ■

Selamat Hari Merdeka 2020

Different Strokes

Is "innovate for change" important? Certainly! In a free-market economy, innovation is the primary driving force for growth and building competitive advantage. Innovate for change may just be the most critical component of any successful organisation and most importantly, an individual.

Driven by change in social norms, exponential technologies, data and platforms utilised, this new digital era presents diverse challenges and changes. Organisations should innovate for change, challenging the status quo of the traditional working environment to stay afloat in challenging times.

But what exactly is innovation? Is it randomly creating new products that seem useful and hope they will sell? No. Unfortunately, that isn't innovation. A simple and more accurate way to describe innovation is the creation of new solutions which answer to the needs of end-users who are willing to pay for the said solutions. Every day, there are companies claiming that their products are innovative but are consumers willing to pay for these so-called innovative products? In a nutshell, innovation is a positive change that people are willing to adopt and can reap benefits from.

In this edition of *JURUTERA*, IEM-WE introduces three outstanding women who come from different backgrounds. Two of them are engineers and the third is a robotics trainer for school-children. They will share their views on innovation and how embracing the mindset of innovate for change can bring positive changes to adopting different ways of thinking and leading to breakthrough innovations, a key element to economic growth and entrepreneurship.

First, there is Prof. Ir. Dr Srimala Sreekantan, a passionate educator and recipient of 10th National Academic Award for Product Innovation & Commercialisation (2017), Top Research Scientists in Malaysia (2016) and Great Women Of Our Time (2016) for Science & Technology awards.

Second is Ms. Irene Lock Sow Mei, winner of the Young ADIPEC (Abu Dhabi International Petroleum Exhibition Conference, United Arab Emirates) Technical Professional of the Year Award (2019), winner of IChemE (Institution of Chemical Engineers) Malaysia Young Industrialist Award (2019), winner of Meeting of Asia & Pacific Women in Science and Technology (MAPWiST) Best Presenter (2019) award and a finalist for IChemE Global Young Industrialist Award (2019).

The third is Ms. Cheryl Ng, a former teacher turned stay-at-home mum who later developed a passion for robotics, thanks to her engineer husband. She is currently the lead of rero EDUteam, the Education Arm of Cytron Technologies which is an impact-driven initiative in support of our national agenda to transform our youth from passive consumers of technology to future tech innovators in the digital economy.

DR SRIMALA SREEKANTAN: BREAKING NEW GROUND

Engineers must stay visible and relevant to industries or communities. Prof. Ir. Dr Srimala from the School of Materials & Mineral Resources Engineering, USM, says it has always been her ultimate goal to be a creative solution provider. Today, being a pioneer who provides creative solutions and makes competition irrelevant is very important when it comes to facing challenges. She foresees the health and environmental segments as goldmines for engineers to venture into and to provide solutions. Health is a huge concern for humans and if one is able to provide solutions for their pain-points, one will certainly be relevant. Therefore, she ensures that all her innovations are related to environmental issues that cause great damage to human health.

Prof. Ir. Dr Srimala Sreekantan

Unlike those who regard innovation as a novel idea, Dr Srimala sees innovations as an opportunity for academic professionals to contribute to the nation's development as well as another way to generate extra income. This will happen when one provides a solution or offers a technology that can resolve consumers' pain-points. Consumers are top priority for any organisation and fulfilling their needs is very important.

FOR BETTERMENT OF SOCIETY

Dr Srimala is an expert in nanotechnology who has commercialised her research products to protect us from microbes, viruses, volatile organic compounds (VOC) and odours. She has invented a technology called nanobuster, a photocatalyst technology which can combat toxic compounds, particulates and infection agents found in air and on surfaces. The product is applied to building surfaces to disinfect the surface and air.

Nanobuster, a transparent metal oxides solution, is sprayed electrostatically on surfaces such as walls and ceilings to create an active coating which acts continuously as an eco-friendly purifier and disinfectant to eliminate VOCs, viruses, bacteria, mould and even odour upon light illumination. All organic contaminants are simply transformed into harmless by-products. It also holds a unique product positioning as it delivers the functions of a purifier and disinfectant with self-cleaning properties. The advantage of this product, as compared to alcohol-based products, is its permanent effect. A single application can protect building inhabitants for 365 days from biological and chemical contaminants. Nanobuster is offered as a solution for corporations, schools, healthcare and transportation organisations etc., to protect inhabitants from surface and air contaminants. With the current Covid-19 pandemic, it has become an essential sanitiser.

Health is everyone's priority. If you are not healthy, you won't be able enjoy your life and your wealth. In a nutshell, if an invention, innovation or development offers a good solution to maintaining good health, consumers will spend on it.

Knowing the market size for your technology is also very important. Each person breathes in 14,400 litres of air every day but what they are breathing in is questionable. Indoor air can be 2-5 times worse than outdoor air. According to the World Health Organisation (WHO), indoor

air pollutants are responsible for the deaths of 4.3 million people annually. This is due to the inhalation of hazardous substances found in indoor air which are emitted from building surfaces, construction materials and indoor equipment or due to indoor human activities such as cleaning or combustion of fuels for cooking or heating. These contaminants, which float freely in the air, cause a variety of short-term and long-term health problems commonly associated with poor hygiene and indoor air quality. These include allergic reactions, respiratory problems, eye irritation, sinusitis, bronchitis and pneumonia.

BRIDGING THE GAP BETWEEN STUDENTS & EMPLOYER

According to Dr Srimala, the gap between students and employees should be closed; she stresses that we should remember that one can go fast alone but not far in life without a team. People do not thrive individually. All stakeholders must work hand-in-hand to support collaborative work among students, academia, industries and communities. This will allow students to mingle with these entities from the early stages and it can be done through collaborative research activities with industries or communities. This way, students will be trained to be relevant and be in step with current industry needs. Let students be street smart as this will help enhance their ideas through inputs by other entities. These ideas can then be turned into innovations. If a person is relevant, he/she will always be in demand.

An educator makes a great impact on students. What an educator imparts will stay with students for a lifetime. Moreover, an educator plays a major role in shaping a child's thought process and so he/she should make the most of this privilege. What is definitely needed is encouraging innovative thinking. Make room for freedom of choice and show the younger generation that it is a two-way street. Trust their strength, let them make their own decisions and carve their own pathways. The tendency for them to choose their own areas of interest is high and this will create wonderful results that we cannot even imagine.

Educators have to create conducive environments that will encourage their students to do so, for example, by focusing more on hands-on learning activities. Allow them to get their hands dirty. Students will flourish when they experience new things. Let them explore beyond our dimension as this will certainly result in innovative thinking. Students learn through example, so introduce them to inspiring innovators that they can relate to and learn from. This will encourage them to be as creative as the person they admire.

Most importantly, educators must ensure that they themselves are relevant to the industry. For this, future engineers need to be alert to global issues which can be an impediment to socioeconomic development. Engineers must be solution providers who are up to date with state-of-art technologies. To visualise alternative solutions and scenarios when faced with problems requires an ability to think outside the box. Engineers need to research, create and design products or services that can positively impact the physical world.

Dr Srimala perceives engineering as a creative industry and to be part and parcel of engineering is a pleasure to an engineer. Today, we live in comfort because engineers have made huge efforts to provide various creative solutions for our wellbeing.

MS. IRENE LOCK: SHAKE IT UP

A Process Engineer specialising in water technology with Group Technical Solutions, PETRONAS, Ms. Lock says it is extremely challenging to be working as an engineer in oil & gas as she has to tackle continuous and dynamic changes in the industry. However, as the saying goes, "some complain that roses have thorns while others rejoice that thorns have roses", so an opportunity often comes disguised as an obstacle or challenge.

Ms. Irene Lock Sow Mei

When Ms. Lock was diagnosed with leukemia 11 years ago, she was forced to defer her studies and to put her dream to be a chemical engineer on the shelf as she had to undergo two years of gruelling chemotherapy and radiotherapy treatment. Battling cancer was the most trying and devastating years of her life. Although the aggressive treatment pushed her to the edge of death many times, it also transformed her into a person with stronger will-power and determination as well as changed her perception of life. She says she used to take things for granted but now, she realises how extremely fragile life can be.

So, when she is faced with challenges in her career and the thought of giving up crosses her mind, Ms. Lock reflects on those difficult years which have become her primary source of motivation to strive on and to give things her best shot. In fact, the greatest lesson she has learnt from battling cancer is to not give up easily. Her twin sister's advice, *"Never let a stumble in the road be the end of your journey"*, also helps motivate and drive her forward.

Ms. Lock strongly believes there should be no gender biases in the

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engineering industry. In PETRONAS, she says, all engineers are given equal opportunities to excel and they work based on competencies and capabilities. What this means, she explains, is that an engineer, whether male or female, will do the job as required. Examples include the need to climb up a 30m-tall boiler to collect samples for analysis, to work the night shift, to inspect commissioning tests and to carry out physical activities in the hot sun or heavy rain.

She has personally gone through such tough experiences which have taught her the importance of being resilient and believing in herself. Nothing is impossible unless we question our own capabilities and look down on ourselves.

In fact, it is encouraging to see more and more female engineers assuming leadership roles and gaining recognition as well as acclamation in the international arena. This has inspired her to become a walking testament that a female engineer is able to deliver outstanding results and to contribute in every aspect for the wellbeing of the community.

At PETRONAS, Ms. Lock was given the opportunity to assume significant roles for the commissioning of a cogeneration plant in Pengerang. This valuable experience has opened her eyes and broadened her horizons. She says the successful adoption and commissioning of the state-of-art German technology in Malaysia is a great milestone, not only for the country, but also as a reflection of her life. The cogeneration plant supplies electricity and steam to the new PETRONAS refinery petrochemical complex as well as power to the national grid for use by local communities.

In her aspiration to promote water 3Rs (Reduce, Reuse & Recycle), Ms. Lock has also applied her technical knowledge and innovation skills to adopt a sustainability concept for the transition of a chemical treatment programme in a cooling tower to an alkaline treatment programme. This means the cooling tower can now be operated at a higher cycle while contributing mammoth savings in water and chemicals used.

YOUNG ENGINEERS INNOVATING TO ADAPT

The earth has always been a scene of constant change. Once, there were dinosaurs and forests in the Antarctica. Changes will continue to occur as a result of the cumulative impact of the development of science and technology, which is the catalyst for the evolution and expansion of civilisation. To remain competitive and productive, it is important for us to be creative and innovative.

In light of the recent coronavirus (COVID-19) outbreak, many organisations have resorted to innovative solutions to maintain business as usual. This global pandemic is compelling governments and societies to turn to and focus on digital technologies, such as web-conferencing as the main channel of communications for engineers to still keep in touch with their colleagues.

Ms. Lock is also inspired to change the world through her writing. During the difficult times when she underwent chemotherapy and reverse isolation in the hospital to prevent infection, she spent her time writing articles and journals to promote the ideology of going green and the importance of STEM (science, technology, engineering & mathematics) education for young children. For this, she was awarded the ASEAN Young Innovative Writer Gold Award in 2013 as her articles gained positive response and instilled greater awareness within the community in South East Asia. For her, the award further stressed the importance of applying technology and creative solutions to create awareness and effectively convey her message.

From writing, she moved on to be a voluntary motivational speaker as she wanted to use her experiences in battling cancer to inspire young engineers on the importance of not giving up despite the odds. She was invited to be a speaker and adjunct lecturer in international and local engineering universities such as Australia's Monash University, China's Xiamen University and Malaysia-Japan International Institute of Technology. She was also invited by local documentary programmes *(Majalah 3, Hitz FM)* and local newspapers to share her stories.

Ms. Lock believes that her involvement in such corporate social responsibility work has helped improve her soft skills as well as sharpened her confidence and leadership qualities. It has given her invaluable opportunities to mentor and enhance the knowledge of young children to provide creative solutions to solve real-life engineering problems. In addition, she also realises that it is only through effective Science, Technology & Innovation education that the younger generation will be well-prepared to face the future as there is strong demand for scientific and technology literacy and to be creative and innovative.

Education is not the filling of a pail but the lighting of a fire. Ms. Lock believes that to be a well-rounded engineer, we should not restrict ourselves to developments at work but that we should also drive for the advancement of innovation in order for future leaders to continuously seize opportunities in the competitive world.

YOUNG ENGINEERS INNOVATING TO BE COMPETITIVE

Advancements in technology, the drastic transformation in societal needs and a knowledge-based economy are creating a strong need for engineers to continuously improve their skills and competencies. Holding a first-class degree is no longer a golden ticket to securing a highly-paid and fulfilling profession. Besides, having good grades in tertiary education doesn't guarantee a smooth sailing career.

As they move from university to the working world, young engineers must realise that their employability highly depends on their willingness to accept new challenges and to adapt to a variety of different work requirements. Besides having strong technical and

professional competencies, they are also expected to demonstrate good attitude, to be able to resolve problems in an independent and creative manner and to have the ability to work with colleagues in collaborative groups.

To remain competitive, it is particularly important that engineers practise lifelong learning and exhibit outstanding leadership qualities. In this context, learning is not restricted to the ability to sharpen and enhance technical knowledge and skills. Working engineers must equip themselves with key competencies such as project management and planning, cost control, soft skills, being techno-savvy, the ability to prepare technical documents and drawings and to organise meetings as well as having good interpersonal relations. Lifelong learning through postgraduate studies or short courses offered by professional bodies such as IChemE, IEM, etc., will equip us with further knowledge and skills.

To stay updated, it is significant for young engineers to participate in relevant technical professional bodies, such as Institute of Engineers Malaysia (IEM), IEEE and IChemE. Besides providing a splendid platform for networking, such professional organisations can also provide opportunities to learn about emerging technologies through their technical and professional development activities, seminars, exhibitions, conferences and tutorials.

Lastly, young engineers must acquire the right attitude and work ethics as "attitude, not aptitude, will determine one's altitude". A career in engineering can be extremely challenging as engineers often have to deal with sudden emergencies and life-threatening situations in their daily work. Hence, a successful engineer should be measured not only by his/her achievements, but also by the opposition, obstacles, and hurdles that he/she has to overcome. One last word of advice from Ms. Lock to young graduates: "If you wish to succeed, make perseverance your bosom friend, experience your wise counsellor, enthusiasm your elder brother and passion your guardian genius".

It is also very important to constantly remind ourselves that our main responsibility is to become a successful engineer who can contribute at every level to build a sustainable society instead of merely pursuing career progression for personal interest and salary increment.

MS. CHERYL NG: FANNING THE FLAMES TO MOTIVATE

Pattie Sellers of *Fortune Magazine* once said that careers are not ladders but jungle gyms and this best describes Cheryl Ng's career path. She was a former school language teacher who was not particularly tech savvy. When she got married, this turning point in her life also happened to be a significant turning point in her career as a few years later, she quit teaching to be a full-time stay-at-home mum.

One afternoon, her engineer husband's rero robotics kit from work caught her attention and she decided to give it a try. She followed the step-by-step instructions provided and was pleasantly surprised that a newbie like her was able to build a robot successfully. The experience piqued her curiosity and ignited her interest in robotics. It was further fuelled by her husband's passion and his job as the design engineer of educational robotics kits for a local tech company.

Her newfound interest soon turned into a full-time vocation. There are plenty of cases where parents are a major influence in their children's career choice and development but for Ms. Ng, it was her spouse who motivated her career switch.

As head of rero EDUteam, the education arm of Cytron Technologies, her main role is to promote STEM to students through robotics and coding. Learning to build and programme a robot can be a complex and difficult process, so when they struggle with the concepts, many students get frustrated. Ms. Ng's goal is to develop a tiered learning environment with lots of fun and engaging activities to keep the young minds interested. Relying on her background in education and years of experience as a teacher, she and her team use innovative and creative coaching to make coding enjoyable and learning fun. As the saying goes, teaching is a science, an art and a craft.

Ms. Ng may be petite in physique, but she definitely has great stature in the STEM community. She has the

Ms. Cheryl Ng

ability to bring together people from diverse backgrounds to work together for a common goal, all for the love of STEM. She and her team have toured the country to conduct state and national level competitions as well as robotics outreach programmes. Along the way, she has also attracted like-minded people as well as created synergies, new collaborations and new opportunities for many.

To lead people from different organisations, without formal authority or hierarchical power but with engagement, credibility and cooperation, is indeed the innovative leadership approach required for the 21st century leaders. With support from volunteers from her collaboration partners, her team of less than 10 people often reaches out to over 1,000 students in a single event.

AFFORDABLE ROBOTICS

Ms. Ng has a natural talent for teaching and inspiring the young. When approached by the founder of Cytron Technology to be one of the pioneers in developing a new online learning module for the rero robotics kit, she accepted the challenge after months of careful consideration. She is confident that the kit is a very powerful learning tool for children and youths alike and can help create a strong STEM culture.

She firmly believes that the future generation should have access to robotics and coding knowledge as these skills are vital in the 21st century. With affordable, high-quality robotics and coding learning materials, she and her team provide students nationwide with the chance to learn robotics and coding regardless of social-economic backgrounds. They are continuously developing new interactive hands-on training systems and structured courses for school teachers. She also regularly appears on the Pendidik Digital MY platform to share her digital skills and knowledge with teachers.

INNOVATION TO INSPIRE

Upholding the vision of "bringing robotics and coding to the masses" Ms. Ng and her team started in 2015 with various initiatives to bring robotics to school-children, hoping to inspire and encourage the latter to be interested in STEM through a series of workshops, maker-camps and robotics competitions. They have changed the way robotics education is delivered to students and with the Jr. Facilitator programme, student volunteers are recruited to inspire and guide other students. This brings the younger generations to work together and not only breaks the age or generation barrier but also promotes the ideology and training of young leadership skills.

Apart from Jr. Facilitator programme, there are rero Educators conferences and free training workshops developed exclusively for teachers to help empower them with robotics and coding knowledge which they can transfer to their students. By empowering teachers, it is envisioned that they will play a role in exposing their students and inspiring them to be the next generation of tech innovators.

ROBOTICS & CODING ENVIRONMENT

Coding was formally included in the official syllabus for all public schools in 2017 as a concentrated effort to promote robotics and coding to young children. This was the result of the nationwide #mydigitalmaker initiative spearheaded by Malaysia Digital Economy Corporation (MDEC).

MDEC is a government-owned agency that focuses on bringing together public-private academic partnerships with the aim to transform our youth from digital users to digital producers. It is only through such initiatives that Malaysia will be able to stay afloat in the digitalised global environment and remain competitive.

Ms. Ng and her team have collaborated with MDEC and the Ministry of Education to run outreach programmes to ignite in the young an interest in STEM education, especially in robotics and coding. They also organise the rero Annual Championship (RAC) robotics competition for the younger generation to showcase their talents and skills. They collaborate with institutions of higher learning to make RAC a reality in order to benefit many students in the process. IEM Women Engineers has also collaborated with the rero EDUteam to encourage girls to engage in STEM through the opportunity to learn coding and building robots.

INNOVATE FOR CHANGE

Indeed, innovation is key to success. What does innovation mean? Why is innovation important? The answer is simply "to stay relevant". Change is inevitable and, in most cases, innovation creates positive change. We must always approach obstacles with an open mind and look at them as a springboard for us to improve and innovate for change.

Innovation is a word with many meanings. It can mean a single breakthrough, for example coming up with a new product, technology or service. It can also mean mental transformation, non-conformity, risk-taking and endurance of uncertainty to excel in non-traditional careers, to adapt and to lead through change.

In our increasingly complex world, managing change and innovation becomes increasingly difficult. Career innovation can happen when we stop looking at our career in the traditional way and perhaps consider moving to another more suited to our future self. To have the courage to change means embracing an innovation mindset that precedes everything else! So let us all stand tall and embrace bold, new innovations that can bring good to mankind. ■

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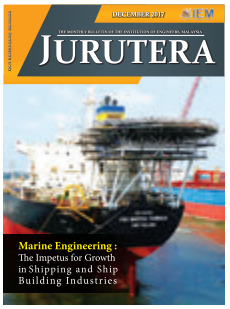

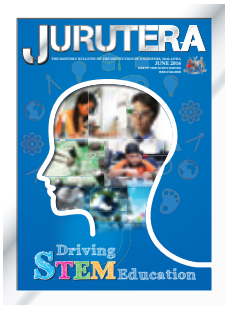

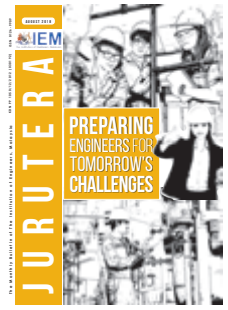

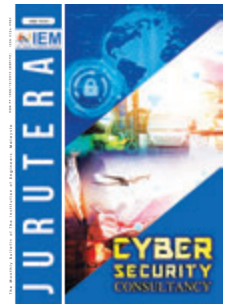

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REVOLUTIONARY ENGINEERS: THE WAY FORWARD FOR SUSTAINABLE DEVELOPMENT

by Ir. Jess Vun Wey Tyng

What makes revolutionary engineers? How are they different from other engineers? The role of revolutionary engineers who can help build and manage a desirable, sustainable future world is something that requires discussion.

Figure 1 is a graph showing the world population forecast from 2000-2100, together with forecasts for the Asia-Pacific Economic Cooperation (APEC) and ASEAN regions. The current world population is estimated at 7.78 billion.

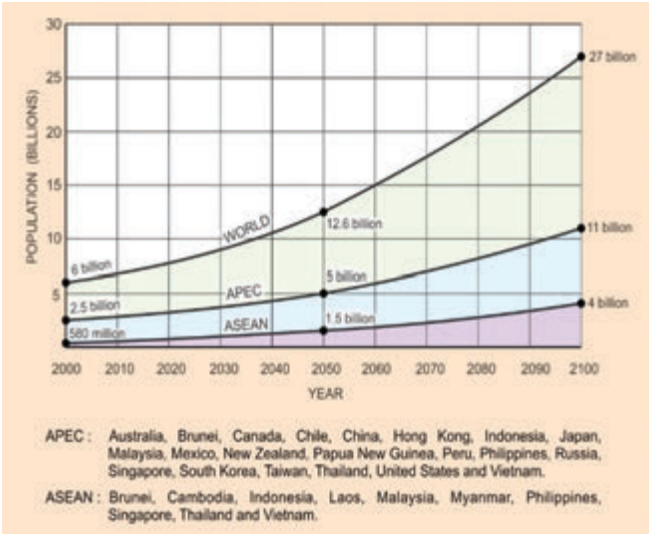

Figure 1: World Population projection for 100 years

With an average annual growth rate (AAGR) of 1.5% per annum, the population for the World, APEC and ASEAN is estimated to be 27 billion, 11 billion and 4 billion respectively by the end of the 21st Century. With such a fast growing population, natural resources will deplete rapidly and even cause irreparable damage to Mother Nature.

"Sustainable development is that which meets the needs of the present without compromising on the ability of future generations to meet their own needs"[1]. The word "sustainability" is derived from the Latin word *sustinere* (*tenere*, to hold; *sub*, under). *Sustain* can mean maintain, support or endure[2,3]. The concept of sustainability is not new but achieving sustainable development is a big challenge, especially that relating to social equity, sustainable economy and the preservation of the ecological integrating of the natural environment on land and in the sea.

From 1980s, the word "sustainability" had been used more in terms of human sustainability on planet Earth. Since then, many of the ideas and concerns have come together in the call for "sustainable development". In 1987, the Brundtland Commission released its final report, Our Common Future, which was defined as the above quote. The Commission had successfully unified environmentalism with social and economic concerns as the development agenda for the world.

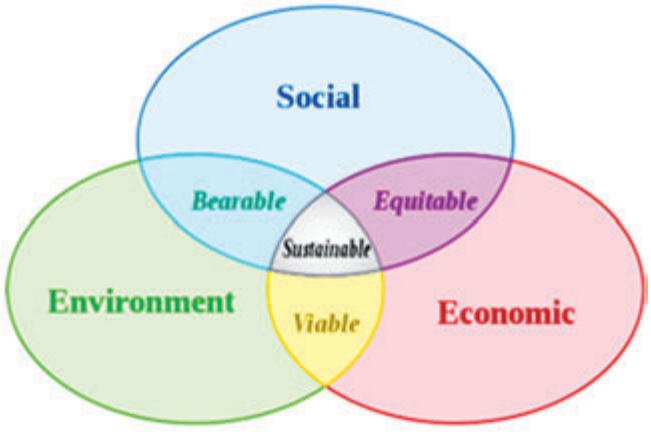

Figure 2: The three pillars of sustainability

Sustainability is a holistic approach that recognises environmental, social and economic dimensions (Figure 2), also known as the three pillars of sustainability, as follows.

Figure 3: Gender Equality in the 2030 Agenda.[6]

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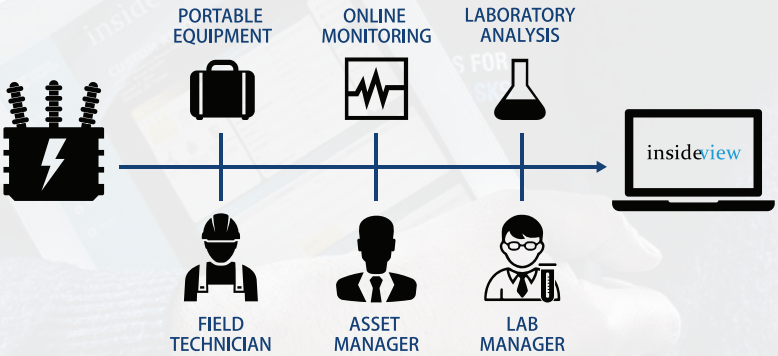

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1. **Environmental Sustainability:** When ecological integrity is maintained, the Earth's environmental systems are kept in balance while natural resources are consumed by humans at a rate at which they can replenish themselves.
2. **Economic Sustainability:** Economic sustainability refers to practices that support long-term economic growth without negatively impacting the social, environmental and cultural aspects of the community.
3. **Social Sustainability:** Universal human rights and necessities are attainable by all people who will have access to enough resources to keep their families and communities healthy and secure. Healthy communities have leaders who ensure personal, labour and cultural rights are respected and that all people are protected from discrimination.

Millennium Development Goals (MDGs) was introduced in 2000 to tackle the indignity of poverty, with global effort. In 2012, the Sustainable Development Goals (SDGs) blueprint was adopted at the United Nations Conference in Rio de Janeiro to address global challenges, including issues related to poverty, inequity, climate, environmental degradation, prosperity, peace and justice, with interconnected goals that leave no one behind. The SDGs are targeted to be achieved by 2030.

The SDGs have 17 global goals that are broad-based and inter-dependent. Each of the SDGs has its own targets and measurable indicators[4]. Various tools are used to track and visualise the progress. In catalysing the 2030 agenda, gender equality is the cross-cutting feature and is key in realising human rights of women and girls.

It is important that the Inter-Agency & Expert Group on Sustainable Development Goals (IAEG-SDGs)[5], an inter-governmental body tasked with preparing a global indicator framework, incorporates progress monitoring of the SDGs from a gender equality perspective. For example, engineers have been designing cooking stoves to replace open fires since the 1950s, but efforts to promote both modern fuels and improved biomass stoves have seen only sporadic success in poor countries. Consultation with different groups of women, especially those more marginalised, on the priorities, design and implementation will yield a higher rate of success.

ROLE OF ENGINEERS & SUSTAINABILITY

Engineers are "practitioners of engineering, professionals who invent, design, analyse, build and test machines, systems, structures and materials to fulfill objectives and requirements while considering limitations imposed by practicality, regulation, safety and cost." The word *engineer* is derived from the Latin words *ingeniare* ("to create, generate, contrive, devise") and *ingenium* ("cleverness").[7]

In this era of rapid change to the world environment, achieving sustainability and fulfilling SDGs are an ever-challenging task. Furthermore, social sustainability, in terms of safety and security, has become a major threat in recent years and this has inextricably jeopardised economic and environment sustainability. When one pillar of sustainability is out of balance, the other pillars will be affected. Therefore, sustainability has to be taken as a holistic approach.

What then is the role of engineers in this new era of world environment in achieving sustainability? We must first evaluate the present education and training system for engineers and then formulate appropriate capacity building programmes to produce suitable engineers for the emerging new world. At the same time, we must ensure the younger generation is exposed to Science, Technology, Engineering & Mathematics (STEM) before we can even talk about an education in engineering.

The aim of a STEM education is to prepare students with the right skills to meet the challenges of science & technology and to ensure that, globally, there are sufficient STEM graduates to meet the demands of the STEM field and to fuel the needs of the revolutionary world. Present day engineers should be advocating this and, at the same time, to include the female gender. Statistics show that a large percentage of female graduate engineers drop out of the industry even before they become professional engineers[8]. It is here that development and sustainability have to be well formulated.

As a whole, capacity building pertaining to the engineering profession can make very important and vital contributions to achieve the aims and objectives of sustainable development, in particular relating to the development and expansion of the physical environment to accommodate changing needs and requirements of the growing population. Engineers need to be able to adapt to the ever-changing physical and social environment and create a congenial and sustainable living environment for the betterment of all. Traditional engineering courses offered by the existing educational system are unable to produce and train engineers to effectively play the role of revolutionary engineers in an environment that is constantly evolving, as there is a lack of emphasis on creative problem solving.

The unseen essence of the physical environment is that it consists of not only structural entity but also of regulated patterns of inter-locking human behaviour which has evolved and continues to evolve from the circular process of human imposing organisation on the physical environment, which in turn imposes organisation on human behaviour pattern.

Revolutionary engineers must be able to play a vital and strategic role in a multi-disciplinary working environment, including understanding human behaviour pattern, in order to build and manage a congenial environment in which we can all live in harmonious symbiosis with the natural environment on a sustainable basis.

Engineers are trained to specifically deal with projects awarded to them. Every project has a starting and completion date whereas, in dealing with sustainability, the main requirement is to focus on the formulation and

implementation of the sustainable development process (SDP), rather than on a particular project with little or no connection with each other.

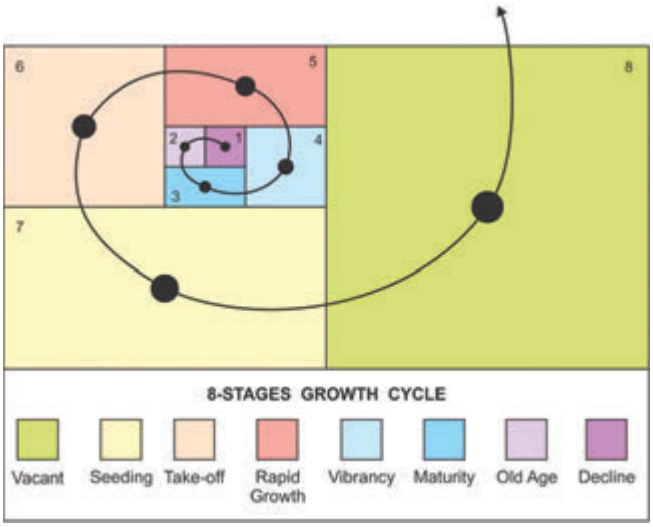

Figure 4: Law of Squares in Urban Growth

The SDP is powered by a set of multiple growth engines. One of the most important growth engines which can be used for capacity building of revolutionary engineers is through the application of Law of Squares (X^2), relating to the growth and expansion of urban settlement areas and living spaces to accommodate the changing needs and requirements of the growing population, in particular those in urban areas.

While the national population grows at an AAGR of 2-3% per annum, the urban population grows much faster due to not only natural growth but also a combination of factors such as rural-urban migration, the increasing trend of inter-regional migration within the country, the in-migration from other countries and the influx of the transient tourist population from the rapidly growing tourism industry worldwide.

Applying the Law of Squares to the growth and expansion of urban settlement areas and living spaces will entail expanding existing urban settlement areas or towns and cities to twice their size in each Development Cycle, represented by a continuous spiral growth. Figure 4 shows that the initial size of the urban settlement area represented by Area (1) is expanded to double its size to settlement Area (2) which is the same size as Area (1) over the First Development Cycle. In the Second Development Cycle, the settlement area is again doubled to Area (3) which is equalled to Area (1) + Area (2). The Third Development Cycle will expand the settlement area to Area (4) which is equalled to Area (1) +Area (2) + Area (3).

The task of capacity building to produce revolutionary engineers needs to be aligned to the growth and expansion of urban settlement areas and living spaces within a designated development region in accordance with the Law of Squares. It should be noted that each succeeding generation of residents in a new settlement area is larger than the one before and each generation in the new settlement area will have new demands and requirements as well as new aspirations for a better future.

Revolutionary engineers must be specially trained with the necessary skill and knowledge to evolve with the changing needs and requirements of the expanding urban settlement areas according to the Law of Squares.

In this era of new technology and globalisation, what kind of future do we engineers envision for ourselves? What kind of mindset should revolutionary engineers embrace? Should engineers be more open minded towards change? How can engineers contribute to the society positively with all these challenges?

Revolutionary engineers must continuously evolve and adapt to the changing needs and requirements of the ever-expanding world, in terms of expansion of the physical environment to accommodate the rapidly growing population, particularly the urban population.

At the same time, they must be able to play a vital and strategic role in a multi-disciplinary working environment for building and managing the desired future sustainable world.

It is very important for the engineering profession to seriously focus on the various aspects of the capacity building process in order to produce revolutionary engineers who can play an effective role in building a new sustainable world. Today's sustainable world also has to include the new norm that we are experiencing due to the recent pandemic. Sustainability in engineering education, gender equality and diversity are among the issues to be incorporated into the way forward. ■

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Author's Biodata

Ir. Jess Vun, who has over 30 years' experience in the engineering and construction industry, is a Triz Level 1 Certified Instructor, Coach and speaker, licensed Property Manager, Certified Anti-Terrorism Risk Management Specialist and Certified Corporate Security Investigation Specialist.

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INNOVATE FOR CHANGE

by Ir. Mah Siew Kien

We often hear about the need to innovate, how change is a constant in our lives and recently, that we are living in unprecedented times which require unprecedented measures.

But what exactly is innovation? Can innovation and technology change our lives? Must we first develop an innovative mindset in order to innovate? Innovation can signify both activities and the outcome of the activities.

The Organisation for Economic Co-operation & Development (OECD) defines innovation as a new or improved product or process (or a combination thereof) which differs significantly from the unit's previous products or processes and which has been made available to potential users (product) or brought into use by the unit (process). In many ways, humankind created exciting innovations in the 20th century that changed the world, such as the invention of the airplane, television, computer, radio, nuclear power, cars, antibiotics, internet and many more.

Innovation has accelerated since we started the new century. Together with the shift from the industrial age to information age, innovation in the 21st century is now characterised by disruption, accelerated technology development and globalised access to information.

As the world welcomed the new decade a few months back, we witnessed many leading innovations, many landmark achievements, many milestones achieved, many ambitious new sustainability initiatives and plans announced for the next 3-5 years. However, the arrival of COVID-19 changed everything, disrupted businesses and forced under-resourced teams in organisations across industries to navigate a new landscape using technology more than ever. Never has the old proverb, "Necessity is the mother of invention", been more impactful than now. Whether we should have an innovative mindset in order to drive innovation where the focus is people or whether we should have technology readily available to drive business innovation and growth, organisations and workers in every industry are reinventing the way they work, their processes, operations and decision-making; they are also redefining their cultural norms, societal values and behaviours.

Humans and technological innovations need to evolve more rapidly than ever for humans to survive, for organisations to maintain their competitive advantages and for some, to remain relevant in the new normal.

PRODUCT INNOVATIONS

Product innovations make people around the world go abuzz with delightful anticipation and excitement as they are more visible to the customers than process innovations. Cavemen struck flintstones against the rock to create fire. Lighters were invented in the 16th century and subsequently, John Walker made the first matches in 1826. Throughout human history, civilisations had witness numerous greatest inventions that changed the world; we will continue to see new inventions that will bring more significant changes in the future.

Today, technological change is accelerating, innovation at scale must be at speed too and adoption rates of new inventions are faster-rising than ever before. We are bombarded with new products almost every day, from devices such as foldable smartphones, drones, 3D-printers, driverless vehicles, robots and artificial hearts to streaming services like YouTube, Netflix and video chat tools such as Zoom, Houseparty and FaceTime.

The difference is that organisations need to prioritise network innovations as the way forward in today's hyper-connected world. Many platforms exist to encourage the open exchange of ideas and information for innovative leaders.

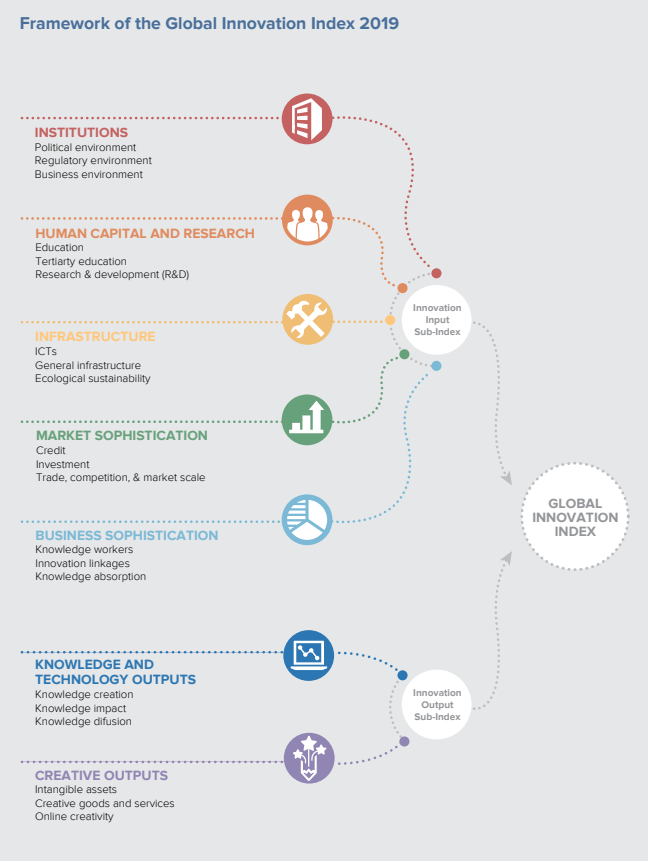
BUSINESS PROCESS INNOVATIONS

However, more and more businesses are now looking at innovations in their business processes to stay ahead of the competition and to gain access to new customers. Business process innovation involves creating work processes, work scope, systems and methods for improving organisational performance from a strategic point of view, resulting in

greater speed and cost savings. Process innovation is never incremental nor continuous because it involves the act of creating an entirely new aspect of a process or even overhauling the process itself to reach a different market or to disrupt an industry. Improving a process is only part of the equation but a process innovation shifts a process into something wholly new and different. That is the main reason why innovation thrives in a crisis. Constraints are innovation enablers. During a crisis, people are prompted to experiment with new things, new processes and are generally much more receptive to new ideas. A crisis can even transform a nation into a testbed. In short, innovation requires us to test different thinking, to fail fast, to learn and to move forward.

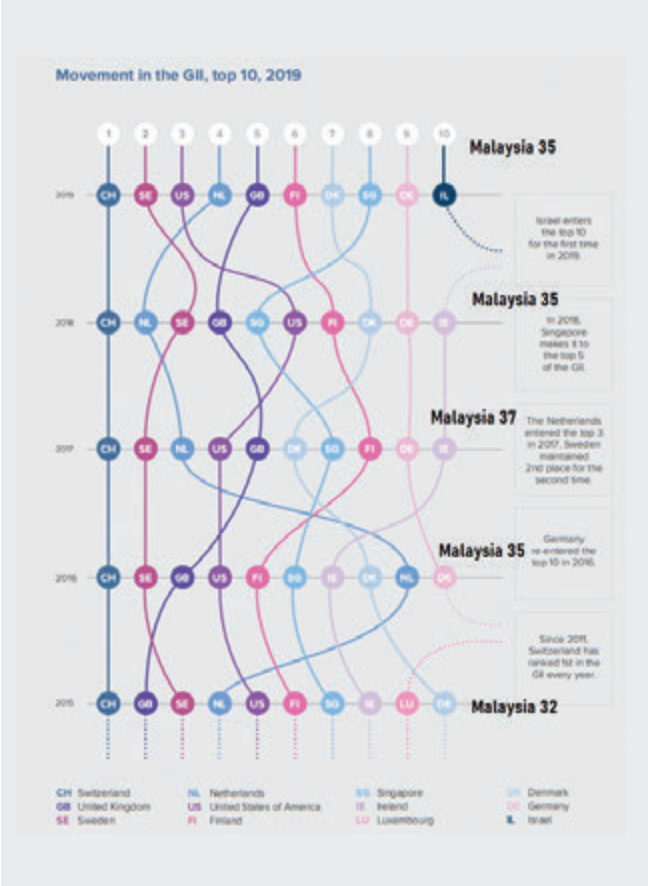
Many millennials and Gen-Z want to work in an area where they can make a difference, creating positive social and environmental impact.

Social innovation is often a disruptive solution to an age-old social problem. Asia has seen a rise in social enterprises in recent years. These use hybrid business models which often have innovative solutions to improve society, use new technology or engage the community in innovative and exciting new ways to make a positive impact on the world and to support Sustainable Development Goals (SDGs).



Source: Global Innovation Index Database, Cornell, INSEAD and WIPO, 2019.

According to a Thomson Reuters Foundation report last year, Malaysia ranked second globally, along with Finland and Greece, for equal pay for women leading social enterprises. The government, through its arm, Malaysian Global Innovation & Creativity Centre (MaGIC) is helping to elevate social enterprises, driving social innovation and usage of various technological innovations. The Global Innovation Index published by the World Intellectual Property Organisation, annually ranks the innovation performance of nearly 130 economies globally. Malaysia ranked 35th last year and for the past few years.



Source: Global Innovation Index Database, Cornell, INSEAD and WIPO, 2019.

GLOBALISATION, INNOVATION & THE GENDER GAP

Globalisation allows new ideas and technologies to spread across the world but it also presents challenges from different perspectives in innovation, such as culture, privacy laws and political concerns. To compete in our ever more integrated economic markets, diverse teams are necessary as they usually perform better in anticipating shifts in consumer habits and consumption patterns by adapting more rapidly to/with new technology. A research study found that companies

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with more women were more likely to introduce radical innovations into the market[1].

Women still are disadvantaged in terms of accessing digital technology in many countries which prohibit them from engaging broadly with the digital economy. The digital divide between men and women continues to exist and grow, resulting in women being left out in the digital knowledge creation, innovation, and entrepreneurship. As the representation of women in the digital world narrows, artificial intelligence technologies will instead, widen the gender gap in the future. The latest Gender Gap Report from the World Economic Forum indicates that only 22% of artificial intelligence (AI) professionals are women compared to 78% men[2].

Incorporating diverse requirements of users and considering diverse perspectives into the design and development of AI is crucial to ensure these will not be trained with gender-bias data and environment. This includes non-tech areas such as philosophy, problem-solving, ethics, education and law.

Innovation and changes are key drivers to improve society. Designing smart fiscal policies will undoubtedly boost innovation and growth. Gender Responsive Budgeting (GRB) is a fiscal innovation that focuses on critical economic and social matters which often overlooked by applying a "gender lens" to the identified processes, resources and institutional mechanisms to ensure effective allocation of public resources[3].

Source: UN Women

In Malaysia, Penang is the first state to implement GRB which analyses decision-making on public expenditure in the context of implications on gender equality and which attempts to bring about development and sustainability. Implementation of innovative gender-sensitive policies and concerted investment in education and training for women and girls will narrow the digital gender gap and barriers to entrepreneurship, innovation and technological advancement. Based on the 2019 data, Malaysia ranked 16th out of 66 countries in the overall gender index for SDG9 with the reference goals on industry, infrastructure and innovation.

THROUGH OUR NANO-LENS

Creating Healthy Lives: the Future of Medical Innovation was the theme for the 2019 edition of the Global Innovation Index. The key to a prosperous nation is access to high quality and affordable healthcare for its citizens as this is imperative to promote sustainable economic growth and greater well-being. Technology has been a major evolving part of our lives today. From smart homes and smartphones to nanoparticles that powers Iron Man's tech suit in *Infinity War,* innovations need both art and science. Sometimes, the smallest of things can lead to the most significant ideas.The healthcare sector is being increasingly influenced by nanotechnology[4]. Real-world breakthroughs at nanoscale, from smart pills and ingestible sensor pill which can be wirelessly controlled to nanoscale sensors and nanoparticles to specifically target cancer cells will be saving a lot of lives in the future. More and more people use smartphones and wearables to manage their lifestyle, such as health apps to track blood pressure, activity or inactivity daily. The potential for both AI and robotics in healthcare is vast as the technology applications will help people to proactively manage their lifestyles[5]. AI technologies and smartphone-based cognitive behavioural therapy may help identify high-risk patients and reduce the barrier and stigma in accessing mental healthcare. Blockchain technology will be an effective way to protect patient data safety and security. Digital trends will change the face of the pharma & healthcare industry rapidly from this year as leadership teams rewrite the rules of upheaval in modern times without cookbook solution after months spent working from home. The challenging part of process innovation is often getting the team on board with change and having a flexible and risk-taking mindset. Digitalisation will transform the healthcare industry, accelerate technological innovations and allow organisations to thrive in the midst of major industry changes as patients will

be able to access more scientific information about their prescribed treatments. Innovation comes from people who are able to connect the arts and sciences as well as link humanity to engineering.

CONCLUSION

2020 is a year of changes! A year of uncertainty and a year of unpredictability, it will result in many unpredicted global experiments. It is not always the strongest species that survives but oftentimes, it is the most adaptable that thrives.

There is no better time than now to be creative and to say: "Let's try it out and see whether it works." Creativity is thinking up new things. Innovation is doing new things indeed.

Let us all prepare ourselves and get ready for 2021 by experiencing new things and doing things differently to be different. ■

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Author's Biodata

Ir. Mah Siew Kien is IEM Council Member and Immediate Past Chairman of Women Engineers Section. She lectures at the School of Engineering & Information Technology, Nilai University.

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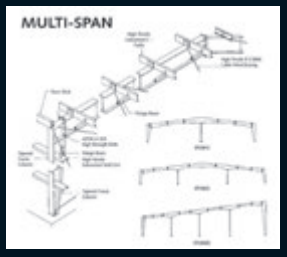

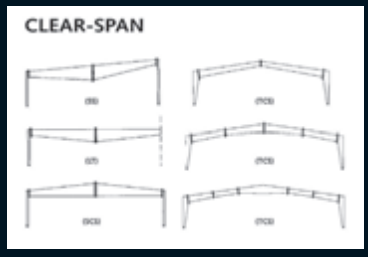

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	Multi-Span		
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(TCM2)	Tapered Column Modular Two Interior Column	28m - 120m	3.5m - 12m and over
(TCMSS)	Tapered Column Multi - Span Single Slope	20m - 160m	3.5m - 12m and over
	Clear-Span		
(SS)	Straight Column Single Slope	4.5m - 22m	3m - 9m
(LT)	Straight Column Lean To	3m - 22m	2.4m - 9m
(SCS)	Straight Column Clear Span	6m - 22m	3m - 9m
(TCS)	Tapered Column Clear Span	6m - 30m	3.5m - 12m and over
(TCS)	Tapered Column Clear Span - Two Piece Rafter	12m - 85m	3.5m - 12m and over
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SUNDA KELAPA – THE PORT THAT NEVER DIES

Ir. Dr Oh Seong Por

Ir. Dr Oh Seong Por *is the chairman of IEM Negeri Sembilan Branch.*

Sunda Kelapa is an ancient canal port located on the estuarine of Ciliwung River on the island of West Java. It is the old gateway to the capital city of Indonesia, Jakarta.

Originally named Sunda Kalapa (which meant Sunda coconut), the port was said to be established in the 5th century during the Tarumanegara Kingdom. From the 13th to 16th century, it was an international port for the Hindu Sunda Kingdom and foreign merchants came from China, Japan, Portugal, Holland and Britain to trade in various commodities, especially pepper.

In 1522, the Portuguese sealed an agreement with the Sunda Kingdom to secure the rights to trade in return for military protection. However, in 22 June 1527, Prince Fatahillah from the Javanese Muslim Sultanate of Demak attacked the Portuguese, captured Sunda Kelapa and renamed it Jayakarta, meaning great victory.

In 1619, the Dutch seized the port and established Batavia. Small ships continued to visit this narrow canal port. However, as ships got bigger and traffic increased after the opening of Suez Canal, the port faced difficulties. This forced the Dutch to build a new port at Tanjung Priok in 1885.

After Independence, the original name Sunda Kelapa was restored to the port. Till today, the port continues to serve mostly pinisi, a traditional two-mast wooden ship which operates inter-island freight service in the Indonesian archipelago. After so many centuries, Sunda Kelapa remains busy and has earned numerous nicknames like "Batavia's Roadstead", "The Port that Never Dies" and "Ancient Port Gave Birth to Modern City". ■

WEBINAR ON MENTAL HEALTH

by Women Engineers Section

How things have changed in just 1 year! Last June, Women Engineers (WE), for the first time, made a bold decision to support and participate in the 1st Mental Health Experiential Conference in Malaysia with the theme, Mental Hazard@Work! Are You at Risk?

The 3-day conference was a new, fresh and unique experience for us at WE. Many government agencies showed their support for the importance of mental health alongside physical health. Speakers at the conference included the Minister of Health, Minister of Human Resources, Minster of Youth & Sports and the Chairman of the National Institute of Occupational Safety & Health (NIOSH).

However, even as ground-level teams work hard to engage the community, the stigma associated with mental health remains the biggest hindrance for people who need help.

In June this year, at the time of writing, there was a considerable and unprecedented increase in awareness of the importance of mental health. In fact, mental health awareness campaigns have never had as much impact or garnered so much attention as it has now. Headline tags such as New Normal, Business Continuity, Innovation, Unemployment and Mental Health are frequently seen in newspapers, articles and at webinars. There have been leadership changes too in the ministries mentioned earlier.

We can't agree more that change is the only constant in life. Coping with change can be a breeze for some but for many, it's often a painful process. During these trying times, taking care of our mental health is very important, if not even more essential.

With this in mind, WE approached Dr Sangeeta Kaur to host a webinar on mental health for engineers. Dr Sangeeta is the CEO of Emerging Journey Asia, founder of Yayasan Health on World and a volunteer at Talian Kasih. The webinar panel speakers included Ir. Sri Hidayati from Persatuan Insinyur Indonesia (PII) and Dr Khong, CEO of TechDome Penang, a not-for-profit science-discovery centre.

Good mental health is when an individual is able to function at a satisfactory emotional and behavioural level when executing daily tasks. Mental health challenges arise when there are issues that need to be addressed but most individuals will not make the effort because it can cause an unpleasant emotional and mental state.

According to Malaysia's National Health & Morbidity Survey (NHMS) 2017, 3 in 10 adults (or 29.2%) experience some form of mental health problems. More than 4.2 million Malaysians are suffering from mental health issues

> *I am proud and honoured to be part of 1st ASEAN Mental Health Awareness for Engineers held by WE IEM in collaboration with EJA and Tech Dome Penang on 5 June 2020. This issue is very relevant in view of the current pandemic situation. It was very exciting to know more about mental health awareness from the experts while sharing my perspectives with cross country organisations and audiences. A salute to the organisers of this fascinating event.*
>
> – **Ir. Sri Hidayati, Board Member of Woman Engineers Forum (WIF), The Institution of Engineers Indonesia.**
>
> *As people of science and engineering, our world revolves primarily around chasing data, putting together the next design and getting things to work. In the process, we often ignore our bodies and minds. I'd like to applaud Women Engineers on this effort to give us occasion to pause and to consider a matter that's usually swept under the carpet, i.e. mental health matters related to engineers and technical people.*
>
> – **Dr Khong Yoon Loong, CEO of Tech Dome Penang.**

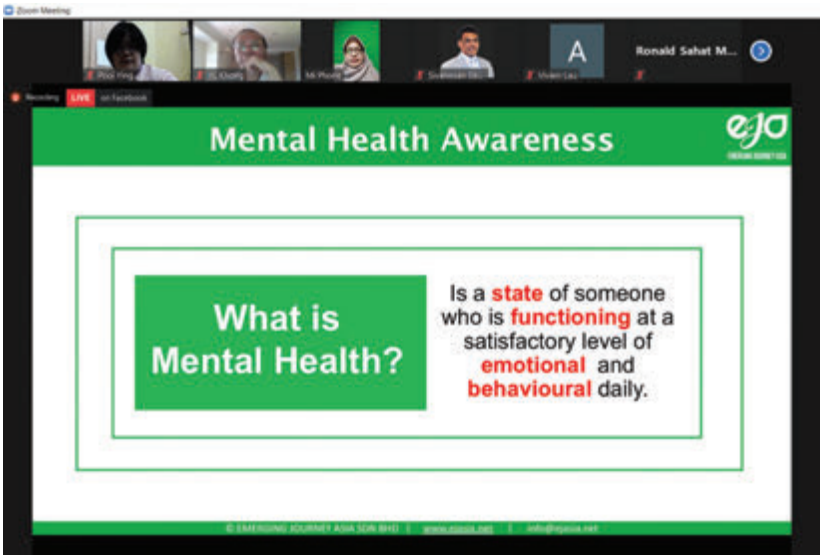
while a lot more cases are not reported because of the stigma that Mental Health = Gila (Crazy) = Unable To Perform. A study by Global Wellness Institute states that by 2030, 38% of the population will suffer from excessive pressure, 24% will actively disengage at work, 2.3 million will be affected by work-related deaths and 313 million by work-related accidents.

The Future of Wellness at Work / Global Wellness Institute

Mental health is a global problem that cuts through race, religion, industry, status and age. It is time that we step up and address it. In Indonesia, 76-85% of those affected do not get proper treatment. In The Philippines, suicide statistics are mainly males. In India, 92.3% of those with mental illness do not seek treatment. In China, 37.8% of the people suffer from depression. In Singapore, mental illness has increased from 2.5% to 3.5% over a short period of time and this is also happening in other Asian countries with similar issues.

This is why it is important that we take action to help instead of stigmatising those with mental health problems. "Nothing Personal" and #reachoutspeakout are approaches that we may all want to adopt.

WE offers a special note of appreciation to Dr Sangeeta who has been extremely supportive of WE and who has been providing us with the necessary technical guidance from the start of the webinar organising to the production of this forum. ■



DESPITE THE PANDEMIC, WE MOVES ON

by Dr Habibah @ Norehan Haron

Ms. Michelle Lau

With the Covid-19 Pandemic and Movement Control Order (MCO), activities planned for Women Engineers (WE) Section were rescheduled, postponed or cancelled. The world paused. Malaysia came to a halt. So did WE.

In a sense, the pandemic proved to be more disruptive than the predicted IR4.0, IoT and technology disruption. Nevertheless, IT technology remains the main means for communicating, teaching and learning, training, for businesses and almost everything that humans need to move on and move forward.

As such, WE planned webinar sessions and participated in two international webinars on topics related to our functions and purposes. On 28 May 2020, Dr Habibah Haron and Ms. Michelle Lau represented WE committee members at a webinar organised by IGI Global, the publisher of Peer-Reviewed, Timely and Innovative Academic Research, in coordination with Laurentian University and York University, Canada. The session was on a recently-released publication titled Impacts of Women in the Academy: Confronting Gender Equality, Diversity, and Leadership, featuring Critical Reflections & Politics on Advancing Women in the Academy. Leading international researchers discussed gender issues in higher education and outlined empowerment strategies to increase inclusivity and diversity. Panel members included editors of the publication, Dr Taima Moeke-Pickering, Dr Sheila Cote-Meek, and Dr Ann Pegoraro. The panel reflected on the timeliness of its recent research. Data from UNESCO's education sector highlighted that two-thirds of the 774 million illiterate people in the world are female.

The panel also discussed issues on women in the academy such as professors, researchers and academicians who continued to face problems such as programme cuts, lack of professional development and leadership opportunities, pay gap and reduced funding for research within the humanities, which included valuable resources on gender and diversity. The panel speakers emphasised the importance of women in leadership, especially in view of the current pandemic.

The WE committee also participated in another webinar titled Responding to COVID-19 – Survival Initiatives & Attributes of Resilient Female Engineers, on 30 May 2020, organised by Women in Engineering (WIE), a Standing Committee of the World Federation of Engineering Organisations (WFEO) with the purpose of empowering women in engineering and technology. The webinar aimed to discuss ways to help build the resilience of female engineers during this trying period as well as matters related to forward-looking initiatives.

"Goal 5 is a one known standalone sustainable development goal (SDG). None of the other SDGs will

work to make the world a better place if Goal 5 – Gender Equality, is not fulfilled," said the host and Chair of WIE, Yetunde Holloway, as she welcomed the distinguished panel of speakers which comprised Dr Moses Iyengunmwena, Ir. Dr Wai Yie Leong and Engr. Olufunmilayo Kadri. The moderator was Dr Ibilola Amao. Engr Kadri highlighted that both genders face the same challenges, such as possible loss of income, either from pay cuts or even loss of employment and rising debt from stalled work.

Mental health challenges and domestic abuses are also real. Before the pandemic, the "super-challenged super woman" works at her professional job in the day and returns home for the "second shift". Now, with work from home arrangements, both shifts overlap but strong resilient women leaders will embrace this as the new norm. ■

EDITORIAL BOARD AND STANDING COMMITTEE OF INFORMATION & PUBLICATIONS (2019/2020)

The history of IEM goes all the way back to 1959, when it was established with the aim to promote and advance the science and profession of engineering in all the various disciplines and to facilitate the exchange of information and ideas related to engineering.

The Editorial Board and the Standing Committee of Information & Publications are devoted to disseminating knowledge to IEM members via *JURUTERA* and IEM Journal. We thank all readers for their continuing support and valuable feedback.

NEW LIFESTYLE DURING COVID-19 PANDEMIC

by Dr Sara Lee Kit Yee

FROM VIDEO CONFERENCING TO WEBINAR

With the Covid-19 pandemic, our lifestyles will never be the same again. Adapting to the new normal was necessary for the recent months of Movement Control Order (MCO), when social distancing was practised. As many companies implemented work from home (WFH), video conferencing and online platforms became a major tool in facilitating communication between employers and employees. This was also a great opportunity for employers to invite speakers from different states to provide online training sessions or webinar sessions for their employees.

Besides in-house webinar sessions, many engineering organisations also held seminars during the MCO months. These included The Institution of Engineers Malaysia (IEM), The ASEAN Engineering Register (AER), The Institute of Electrical & Electronics Engineers (IEEE), the Institution of Mechanical Engineers (IMechE), The American Ceramic Society (ACerS) and more. Since most webinars were free for members worldwide, participants could attend by simply following the time zone given instead of having to travel abroad.

FROM GROCERIES TO FOOD DELIVERY

Besides WFH, staying healthy at home by observing a proper diet was also essential. Online grocery deliveries gained popularity throughout the MCO period. Due to the high demand from well-known online grocery stores, such platforms provided a good opportunity for small and medium grocery stores to start an online business. These stores started to advertise their products and delivery services on online shopping platforms and social media.

Food delivery services picked up; contactless payment and delivery were implemented. The convenience of such services attracted the attention of the public as meals were received quickly without the hassles of preparing, cooking and cleaning up, especially for those who were busy working from home.

Parcels all set for delivery
(Picture by Mr. Jason Lee)

FROM BANKNOTES TO E-WALLETS

According to WHO, the Covid-19 virus is transmitted when we are in close/direct contact with infected persons, via respiratory droplets or contact with contaminated objects and surfaces. Contactless payment was encouraged; even from the start of MCO,

the use of credit cards or e-wallets was a preferred choice for transactions. This created a good business opportunity for retail shops which had implemented cashless payments, where e-wallets such as Touch 'n Go, GrabPay, Boost etc. were available.

Pos Laju workers loading parcels into a van. (Picture by Mr. Jason Lee)

FROM TRADITIONAL RETAIL TO E-COMMERCE ONLINE SHOPPING PLATFORMS

With the closure of non-essential businesses, online shopping platforms such as Shopee and Lazada were replacing physical shopping malls. Apart from food and groceries, there are other necessities, such as pet food, plant fertiliser, hardware items, garments and electrical/ electronic appliances etc.

With the massive growth of online businesses, courier services such as Pos Laju, J&T, DHL etc. had to work very hard to fulfill the demands for parcel delivery. According to hardware shop owner Jason Lee, online sales tripled in volume, with orders coming in from different online shopping platforms.

With the MCO, available pick-up van services from retail shops to the courier hub were revised to once every three days instead of daily. Due to the capacity of the courier van and the high demand, sellers had to transport the parcels themselves to avoid delays in delivery. It was evident that people were purchasing hardware or spare parts on online shopping platforms as maintenance/repair services were not available during the MCO. Besides, there was a great sense of self-satisfaction in learning to do simple maintenance or repair works by following guidelines in online articles and videos.

In short, the recent changes have opened many doors of opportunities for organisations and industries to keep up with the latest technologies. With the integration of new technologies, the public will be able to move forward with continuous learning and improvement. ■

UPCOMING ACTIVITIES

WEBINAR - Addressing Issues With Risk Engineers

Date	: 5 August 2020 (Wednesday)
Time	: 10.30 a.m. – 12.30 p.m.
Venue	: Online Platform
Approved CPD	: 2
Speaker	: Ir. Gary Lim Eng Hwa

WEBINAR - Lecture SERIES: Best Practices on Road Construction and Preparing BQ based on Civil Engineering Standard Method of Measurement MSCESMM (2018), MyCESMM 2

Date	: 5 August 2020 (Wednesday)
Time	: 2.00 p.m. – 5.00 p.m.
Venue	: Online Platform
Approved CPD	: 3
Speaker	: Ir. Gunasagaran Kristnan

WEBINAR - Workshop on Managing Engineering Competency Development (ECD) Log Book

Date	: 8 August 2020 (Saturday)
Time	: 9.00 a.m. – 5.00 p.m.
Venue	: Online Platform
Approved CPD	: 6
Speaker	: Associate Professor Ir. Dr Ts. Abdul Talib Din and Ir. Han Seng Kong

WEBINAR - Earth Fault Analysis

Date	: 8 August 2020 (Saturday)
Time	: 9.30 a.m. – 11.30 a.m.
Venue	: Online Platform
Approved CPD	: 2
Speaker	: Ir. Lee Chong Kiow

RE-ENGINEERING THE WORKPLACE WITH NEW NORMS

by Ir. Tajul Ariffin Mohamed Nori

Ir. Francis Ngiam Kee Hwee

Dr Sara Lee Kit Yee

The unpredicted contagion of Covid-19 has forced society to adhere to movement restrictions. As a vaccine is still unavailable, we must embrace proactive and conservative steps to further mitigate the risk of Covid-19 and to reduce the rate of contagion. It is important that adequate preventive measures are in place as people are getting back to work.

It is necessary to redesign the workplace to prevent the spread of Covid-19 and engineers can help redesign workplaces as required.

OPPORTUNITIES FOR ENGINEERS

The pandemic has influenced how workers and workplaces should operate. While some companies have taken a new form of business nature, such as allowing employees to work from home, there are many jobs still that require our physical presence at workplaces.

Preventive measures (such as proper physical distancing, provision of washing facilities and respiratory etiquette) would need to be implemented as outlined by the WHO[1] before physical presence at the workplace is resumed. Getting employees to fully adjust to the new norms will prove challenging and it requires continuous monitoring by employers to prevent any mistake that may jeopardise the business operation.

More and more businesses will adopt the use of technology tools and innovation (e.g. virtual meetings, digital transactions, autonomous control, Artificial Intelligence, robotics etc.) as part of their business strategies to sustain operations. The need for the right workplace design or solution will open up new opportunities for engineers.

DESIGN FOR SAFETY & HEALTH

Engineers use math and science to provide innovation and inventions that shape our society and improve the way we live and work. The risk of exposure to Covid-19 poses a design challenge that requires engineers to consider safety and health hazard prevention and control in their designs. The virus spreads through respiratory droplets released when an infected person

The disruptive Covid-19 pandemic has changed lifestyles and business operations. Image courtesy of pixabay.com

coughs, sneezes or talks. These droplets can remain suspended in the air or on surfaces long after the carrier has left. With a better understanding of how the virus is spread, engineers can redesign workplaces to incorporate selected hazard control measures based on the hierarchy of controls: Elimination, substitution, engineering controls, isolating workers from the hazard, changing the way workers conduct their activities and protecting workers with proper PPE.

Workers must understand the redesign works and be prepared to adapt to changes in their workplaces. Worker involvement in the redesign process is necessary for an effective solution. When no single control option can fully protect workers from Covid-19, a combination of control measures will be needed.

A hazard control plan (HCP) should be developed to guide the selection and implementation of controls and to implement the controls according to the plan. It should involve all stakeholders, including the top management. In addition, the HCP should describe how to verify and follow up on the effectiveness of controls after they are implemented.

Engineers should conduct periodic inspections to confirm that engineering controls are operating as designed, with work practices, administrative controls and PPE utilisation policies being followed. To establish sound preventive measures for worker safety and health, the following general principles of prevention should be embedded in the workplace solutions as early as the design stage.

1. Whenever possible, business continuity planning must consider avoidance of risks to contagious transmission.
2. Evaluate the risk to contagious transmission as the business operation resumes. Risk assessment on workers' essential activities must be conducted.
3. Whenever possible, employers must identify potential sources of contagious transmission.
4. Consider designing and/or adopting work systems which optimise human well-being and performance.
5. Utilise technology tools and innovations to the maximum and continuously monitor workers' well-being and performance.
6. Replace dangerous articles, substances or systems of work with non-dangerous or less dangerous articles, substances, or systems.
7. Use a combination of preventive measures with multiple layers/levels of protection instead of one single measure.
8. Develop an adequate prevention policy by strictly adopting requirements set by the authorities having jurisdiction.
9. Provide workers with appropriate training and education, especially on the awareness of Covid-19 and its transmission.

We can expect more automation in the future. What has been predicted in regard to automation may be fast-tracked by the Covid-19 pandemic because autonomous technologies provide a better operational continuity and sustainable economic growth for businesses.

In view of the foreseeable trend, engineers must keep in mind to design workplaces that are flexible for future alteration and they should proactively stay up to date with new technologies and new markets. ■

[1]Statement – Transition to a 'new normal' during the COVID-19 pandemic must be guided by public health principles 16 April 2020, Copenhagen, Denmark, Dr Hans Henri P. Kluge, WHO Regional Director for Europe, http://www.euro.who.int

IEM MELAKA PRE-AGM TECHNICAL TALK & 33RD ANNUAL GENERAL MEETING

by Ir. Mohd Fairuz bin Mohd Rashid

The Institution of Engineers Malaysia (IEM) Melaka Branch held its Pre-AGM Technical Talk at Temasek Hotel, Jalan D'Albuquerque, Perkampungan Portugis, Melaka on 14 March 2020.

The technical talk on cases of boiler accidents and explosions in the country which had been investigated by the Department of Safety & Health Malaysia (DOSH), was delivered by Ir. Ts. Mohd Fairuz bin Mohd Rashid and attended by 25 participants.

Some of the participants at the talk

A boiler explosion is the catastrophic failure of a boiler. There are many causes, such as poor water treatment which causes scaling and overheating of the plates, low water level, a stuck safety valve or even a furnace explosion which, in turn, can cause a boiler explosion if it is severe.

After the talk, IEM Melaka Branch held its 33rd Annual General Meeting (AGM). Gracing the event was Deputy IEM President Ir. Ong Ching Loon who, in his opening speech, thanked all members who attended.

The AGM began with a confirmation of the previous minutes, followed by a presentation of the annual report 2019/2020, presentation of financial statements, dissolution of committee members 2019/2020 and appointment of new committee members for session 2020/2021.

New chairman of IEM Melaka Prof. Ir. Dr Puvanasvaran

In his closing remarks, Ir. Ong urged the branch members to be active and supportive of the activities of the association. He said IEM needed to maintain a good performance record so as to be known as a successful organisation.

When the AGM ended at around 1.00 p.m., light refreshments were served and those present took the opportunity to socialise and network. ■

New committee members (2020/2021) of IEM Melaka

IEM UCSI STUDENT SECTION: ONLINE FORUM ON OPERATIONAL MANAGEMENT

by Hew Chee Wern

On 6 June 2020, IEM's Student Chapter of UCSI University organised an online forum on Operational Management Implemented in Biofuel Supply Chain: Current Issues in Southeast Asia. This marked our first web-based event. The guest speaker was Dr Rachel Hoo from the National University of Singapore (NUS) and the host was club advisor Mr Tey Wah Yen.

Microsoft Teams and Facebook Live were used to broadcast the forum. The event started at 10 a.m. and we were delighted to have 121 participants for the session.

Dr Hoo discussed the role of operational management in bioenergy supply chain planning, how it could be utilised to address environmental pollution issues surrounding the biofuel upstream production and the key biofuel policies in Southeast Asia. The talk was followed by a Q&A session, a group photo session and a feedback session.

Overall, participants came away with a better understanding of the biofuel supply chain and we are certain this will be useful for students as it is potential research area with promising emerging technologies. ■

HISTORICAL GEM OF JAPAN

Choong Pooi Ying

Choong Pooi Ying *is an aspiring young Mechanical Engineer who has ventured into the field of Corrosion Engineering.*

The majestic Karasaki Pine trees with their traditional winter protection

Located merely 3 hours from the hustle and bustle of Tokyo via the Shinkansen ride, Kanazawa (金沢) is a cultural melting pot with wonderful historical sites not to be missed! Located in Ishikawa prefecture, it is dubbed Little Kyoto as its cultural charms are similar to that of Kyoto. But it is less crowded than Kyoto as foreign tourists often overlook this destination. It was only in 2015 that the Hokuriku Shinkansen (北陸新幹線) linked Tokyo to Kanazawa.

A trip to Kanazawa is not complete without visiting the scenic Kenrokuen (兼六園) or Six Attributes Garden, so named as it is said to have all six essential attributes of a perfect garden according to Chinese landscaping theory. These are spaciousness, seclusion, artificiality, antiquity, abundant water and broad views. Kenrokuen, one of the most beautiful landscaped gardens of Japan, is pleasant and relaxing with beautiful pathways, koi ponds and mesmerising landscapes which are works of art by its team of highly skilled gardeners and caretakers.

In autumn, maple and cherry trees take on the beautiful colours of fall and the Karasaki Pine (唐崎松), large, prominent pine trees planted from seed near Kasumigaike Pond, are prepared with traditional protection for the coming winter months. Gardeners secure ropes and support structures to the main trunks of the pine trees so as to support the branches and to prevent the excessive weight of snow causing damage to the trees.

Another notable site in Kanazawa is Higashi Chaya District (東茶屋街), literally translated as East Tea House Street. Chaya is a traditional place for entertainment dating back to the Edo period and where geishas entertain customers of high ranking with traditional dances and music. As the largest and most well-preserved tea house town, Higashi Chaya District has been designated a cultural asset of Japan. Visitors may even chance upon bridal couples in ceremonial wedding attire posing for portraits here.

The tea houses in this district were built about two centuries ago. While exploring the areas in this, you will also see many traditional shrines with unique architecture. Definitely a picture worthy location!

If you love sashimi, head for Ōmichō Ichiba (近江町市場), Kanazawa's largest fresh food market. There are about 200 stalls selling seafood, fresh produce and household items. The market is also home to restaurants, many of which serve rice bowls topped with fresh Kanazawa seafood.

Kanazawa. I will definitely be back! I will never forget the wonderful memories and zen experience it has given me. ■

Shrine with trees in autumn shades

TEMUDUGA PROFESSIONAL

Tarikh: 13 Julai 2020

Kepada Semua Ahli,

SENARAI CALON-CALON YANG LAYAK MENDUDUKI TEMUDUGA PROFESIONAL TAHUN 2020

Berikut adalah senarai calon yang layak untuk menduduki Temuduga Profesional bagi tahun 2020.

Mengikut Undang-Undang Kecil IEM, Seksyen 3.8, nama-nama seperti tersenarai berikut diterbitkan sebagai calon-calon yang layak untuk menjadi Ahli Institusi, dengan syarat bahawa mereka lulus Temuduga Profesional tahun 2020.

Sekiranya terdapat Ahli Korporat yang mempunyai bantahan terhadap mana-mana calon yang didapati tidak sesuai untuk menduduki Temuduga Profesional, surat bantahan boleh dikemukakan kepada Setiausaha Kehormat, IEM. Surat bantahan hendaklah dikemukakan sebulan dari tarikh penerbitan dikeluarkan.

Ir. Mohd Khir bin Muhammad FIEM, PEng
Setiausaha Kehormat, IEM
(Sesi 2019/2020)

PERMOHONAN BARU

Nama	Kelayakan
KEJURUTERAAN AWAM	
ABANG MUHAMMAD QHAIRY BIN ABDUL RAHIM	BE (SWINBURNE) (CIVIL, 2012)
INTAN NOR ZULIANA BINTI BAHARUDDIN	BE HONS (UTM) (CIVIL, 2006) MSc (UiTM) (CIVIL-GEOTECHNIQUE, 2010)
KEJURUTERAAN KOMUNIKASI	
SAIDATUL NORLYANA BINTI AZEMI	BE HONS (UniMAP) (COMMUNICATION, 2007) MSc (UniMAP) (COMMUNICATION, 2010)

PERMOHONAN BARU / PERPINDAHAN MENJADI AHLI KORPORAT

Nama	Kelayakan
KEJURUTERAAN AWAM	
CHONG WAN YOON	BE HONS (NANYANG) (CIVIL, 2013)

PERPINDAHAN AHLI

No. Ahli	Nama	Kelayakan
KEJURUTERAAN AWAM		
39026	FERNANDEZ AU	BE HONS (UTHM) (CIVIL, 2011)
35919	LEOW ANN HONG	BE HONS (UTM) (CIVIL, 2010)
41069	NGIEN SU KONG	BE HONS (UTM) (CIVIL, 2006) MSc (CARDIFF) (WATER, 2008) PhD (UTM) (CIVIL, 2012)
53610	NOR AZRA BTE AB WAHAB	BE HONS (UKM) (CIVIL & STRUCTURAL, 2013)
21173	REDZUAN BIN MD YUNUS	BE HONS (UTM) (CIVIL, 2003)
47873	SITI HAJAR BINTI MANSOR	BE HONS (UTHM) (CIVIL, 2013) ME (UTHM) (CIVIL, 2016)
KEJURUTERAAN ELEKTRIKAL		
94036	KARTHINATHAN A/L RANGANATHAN	BE HONS (UTM) (ELECTRICAL & ELECTRONICS, 2012)
90761	NAJLAN BIN ISMAIL	BE HONS (UNITEN) (ELECTRICAL POWER, 2014)
KEJURUTERAAN ELEKTRONIK		
88959	AZRULAZHAR BIN JAMALUDIN	ME (SURREY) (2007)
43556	NORFAIZA BINTI FUAD	BE HONS (UTM) (COMPUTER, 2003) MSc (UPM) (COMPUTER SYSTEMS, 2007) PhD (UiTM) (ELECTRICAL, 2017)
24438	SURESH KUMAR A/L KANDASAMY	BE HONS (USM) (ELECTRICAL & ELECTRONIC, 2000) MSc (UKM) (ELECTRICAL, ELECTRONIC & SYSTEM, 2005)
99363	TAY LEE CHOO	BE HONS (ESSEX) (COMPUTER AND COMMUNICATIONS, 1990) ME (UNITEN) (ELECTRICAL, 2017)
KEJURUTERAAN MEKATRONIK		
45316	ANG CHUN KIT	BE HONS (UCSI) (MECHATRONIC, 2010)
KEJURUTERAAN PERKHIDMATAN BANGUNAN		
50213	CHIENG HENG MING	BE HONS (UTAR) (MECHANICAL, 2010)
105925	POH AIK CHONG	BE HONS (MMU) (MECHANICAL, 2011)

PERMOHONAN BARU / PERPINDAHAN MENJADI AHLI KORPORAT

No. Ahli	Nama	Kelayakan
KEJURUTERAAN AWAM		
14372	MASRI BIN BAHARUDDIN	BE HONS (UTM) (CIVIL, 1992)
KEJURUTERAAN PEMBUATAN		
104183	SAMI SALAMA HUSSEN HAJJAJ	BE HONS (IIUM) (MANUFACTURING, 2003) MSc (IIUM) (MANUFACTURING, 2007) PhD (UNITEN) (2018)

Pengumuman yang ke-141

SENARAI PENDERMA KEPADA WISMA DANA BANGUNAN IEM

Institusi mengucapkan terima kasih kepada semua yang telah memberikan sumbangan kepada tabung Bangunan Wisma IEM. Ahli-ahli IEM dan pembaca yang ingin memberikan sumbangan boleh berbuat demikian dengan memuat turun borang di laman web IEM http://www.iem.org.my atau menghubungi secretariat di +603-7968 4001 / 5518 untuk maklumat lanjut. Senarai penyumbang untuk bulan Jun 2020 adalah seperti jadual di bawah:

NO.	NO. AHLI	NAMA
1	57060	MR. MOHD FAUZI BIN ABDULLAH
2	102474	MS. AISHAH BINTI TAHA
3	59965	MR. SU HOW TOON
4	09016	MR. MUSA BIN OMAR
5	60072	Ir. DR IRYANI BINTI MOHAMED RAWI
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8	15362	MR. YU KIANG HOCK
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20	17679	Ir. CHOY WENG WAH
21	11429	Ir. ROSLI BIN ABDUL HAMID
22	10452	Ir. AMIN BUHARI BIN MD ZAIN

UPCOMING ACTIVITIES

WEBINAR - How to be a successful Project Manager

Date	: 8 August 2020 (Saturday)
Time	: 2.00 p.m. – 4.00 p.m.
Venue	: Online Platform
Approved CPD	: 2
Speaker	: Major (R) Dr J. Prebagaran

CALL FOR NOMINATIONS

IEM ENGINEERING HALL OF FAME AWARD 2021

The Sub-Committee of Engineering Hall of Fame under the auspices of the Standing Committee on Professional Practice is proud to invite nominations for the IEM Engineering Hall of Fame Award 2021.

It is timely and expedient to induct and to record the accomplishments of engineers in the country who have or had demonstrated particularly outstanding professional achievements and provided excellent services to the Institution, the engineering industry and the Nation.

The IEM Engineering Hall of Fame is established with the aim to confer recognition and to celebrate the accomplishments of members of the IEM:

- Who have demonstrated outstanding professional achievements.
- Who have made significant contributions to the engineering profession, the Institution of Engineers, Malaysia (IEM) and the Nation.
- Who have rendered valuable service to the Community.

The Engineering Hall of Fame will serve as the focal point or showcase of outstanding Malaysian engineers, past and present, who had or have made great contributions to the engineering profession and to the quality of life in Malaysia. Engineers honoured in the Engineering Hall of Fame will also serve as a beacon and as role models for young engineers as well as create greater interest in engineering in general and awareness of the contributions made by outstanding engineers in the country.

Nominations for the Award are open to Malaysian citizens who are or have been Corporate Members of the IEM.

The closing date for receipt of nominations for IEM Engineering Hall of Fame Award is 30 September 2020.

Please submit nominations to:

Honorary Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, 46720 Petaling Jaya, Selangor.

The nomination form can be downloaded from the IEM website at ***www.myiem.org.my***

For further details, kindly contact IEM Secretariat at **03-7968 4001/2**

IEM AWARD FOR CONTRIBUTIONS TO THE ENGINEERING PROFESSION IN MALAYSIA 2021

To encourage an interest in engineering and to recognise important services or contributions to engineering in Malaysia, the IEM Award for Contribution to the Engineering Profession in Malaysia is to be presented to the person(s), who has:

- Contributed to the advancement of engineering in Malaysia, and/or
- Designed and constructed an original engineering device or system of merit and applicability to industry.

This Award is open to all Malaysian citizens and permanent residents.

NOMINATIONS

- Nominations will be invited annually. The closing date for receipt of nominations for each year is 30 September.
- Nominations shall be made through a member of the Institution. Each member is restricted to one nomination per year.
- Each nomination shall be accompanied by a brief write up of the services rendered or contributions made or system designed and/or constructed together with relevant photographs and other documents.

AWARD

- The Award is to be made by the Council upon recommendation by the Awards Committee.
- The Award shall comprise a metal plaque, a scroll and a sum of RM1,000.

The closing date for nominations is 30 September 2020.

Please submit nominations to:

Honorary Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, 46720 Petaling Jaya, Selangor.

The nomination form can be downloaded from the IEM website at ***www.myiem.org.my***

For further details, kindly contact IEM Secretariat at **03-7968 4001/2**

IEM OUTSTANDING ENGINEERING ACHIEVEMENT AWARD 2021

The IEM Outstanding Engineering Achievement Award is created to confer recognition to an organisation or body for outstanding engineering achievements within Malaysia. The award will be given to an organisation or body responsible for an outstanding engineering project in the country.

The basis for the award shall be an engineering achievement that demonstrates outstanding engineering skills which has made a significant contribution to the profession and to the quality of life in Malaysia. In making the selection, the following criteria will be given special consideration:

1. Contribution to the well-being of people and communities,
2. Resourcefulness in planning,
3. Creativity in the solution of design problems,
4. Pioneering use of materials and methods,
5. Innovations in planning, design and construction,
6. Unusual aspects and aesthetic values.

Engineering achievements which include, interalia, the following can be submitted for consideration:

- Bridges, Tunnels, Waterways Structures, Roads
- Telecommunications of national/ international character, Power Transmission and Transportation
- Dams and Power Stations
- Ports and Harbours
- Building and Structures
- Airports
- Water Supply, Waste Disposal Projects
- Military projects such as bases, launching units, harbour facilities
- Drainage, Irrigation and Flood Control Projects
- Local design and manufacture of high technology products
- Energy, Heat, Mass Transfer
- Outstanding work in engineering research and development
- Chemical processing of indigenous raw resources such as rubber, palm oil and various other local plants
- Innovative use of local engineering materials
- Outstanding contribution in engineering education
- Original discovery of useful engineering theory

Nominations are invited from all members of the Institution. Each nomination submitted should contain a brief summary/write-up of the project in approximately 1,000 to 2,000 words together with full relevant reports on the project and three copies of supporting documentation including photographs. A project or component part thereof which has received an earlier award, from IEM does not qualify for nomination.

- The award in the form of a metal plaque, naming the achievement shall be given to the organisation or body responsible for the project for permanent display.
- The award shall be presented with due ceremony at an appropriate function of the IEM.

The closing date for nominations is 30 September 2020.

Please submit nominations to:

Honorary Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, 46720 Petaling Jaya, Selangor.

The nomination form can be downloaded from the IEM website at ***www.myiem.org.my***

For further details, kindly contact IEM Secretariat at **03-7968 4001/2**

IEM YOUNG ENGINEER AWARD 2021

The objective of the Award is to encourage interest in engineering and to recognise potential among young engineers in Malaysia. The Award will be presented to the person who has shown outstanding ability and leadership qualities, either

i. in the design and/or construction of an engineering device or system of merit; or
ii. in the research and development or teaching of engineering.

In any one year, the Award may be made in either one or both of the categories mentioned above. If the Award is to be made in only one of the two category may be made in the year. The Award is open to candidate who are:

i. Registered member with the Board of Engineers, Malaysia and under 35 years of age
ii. Malaysian citizens or permanent residents of Malaysia
iii. Graduate or Corporate Members of IEM.

The Proposer may or may not be a member of IEM. However, each nomination shall be supported by a brief recommendation from two Referees who are Corporate members of IEM. If the Proposer himself is a Corporate member of IEM (or higher), then he may also act as one of the two required Referees.

The Award will comprise a cash prize of RM500.00, a scroll and plaque, to be presented with due ceremony to each recipient of the Award.

The closing date for nominations is 30 September 2020.

Please submit nominations to:

Honorary Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, 46720 Petaling Jaya, Selangor.

The nomination form can be downloaded from the IEM website at ***www.myiem.org.my***

For further details, kindly contact IEM Secretariat at **03-7968 4001/2**

IEM WOMAN ENGINEER AWARD 2021

The primary objective of the Award is to recognise the contributions by women engineers. This Award may also incidentally encourage interest in engineering among women and encourage them to strive towards greater excellence. The Award will be presented to the woman engineer who has shown outstanding ability and leadership qualities, or has been a pioneer in any more of the following areas:

- In the design and/or construction of an engineering device or system, structural system, planned development, environmental improvements or,
- In the research and development of engineering device, systems, processes and/or materials, publication of paper or,
- In the teaching of engineering or,
- In the management of engineering projects,
- Entrepreneurship in the commercial sector.

In making the selection, the following criteria will be given special consideration:

- Contribution to the well-being of people and communities
- Resourcefulness in planning and in the solution of design problems
- Pioneering in use of materials and methods
- Innovations in planning, design and construction
- Unusual aspects and aesthetic values

The Award is opened to candidates who are:

- Registered members of the Board of Engineers, Malaysia,
- Malaysian citizens or permanent residents of Malaysia,
- Graduate or Corporate Members of The Institution of Engineers, Malaysia.

The Proposer may or not be a member of IEM or BEM, or an engineer. However, each nomination shall be supported by a brief recommendation from two Referees who are Graduate or Corporate member of IEM. If the Proposer is herself either a Corporate or Graduate member of IEM (or higher), then she may also act as one of the two required Referees.

The Award shall comprise a cash prize of RM800.00, a scroll and plaque, to be presented with due ceremony to each recipient of the Award.

The closing date for nominations is 30 September 2020.

Please submit nominations to:

Honorary Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, 46720 Petaling Jaya, Selangor.

The nomination form can be downloaded from the IEM website at ***www.myiem.org.my***

For further details, kindly contact IEM Secretariat at **03-7968 4001/2**

UPCOMING ACTIVITIES

WEBINAR - Power Capacitors based on MS IEC 60831-1 (1&2)

Date	: 13 August 2020 (Thursday)
Time	: 9.00 a.m. – 11.00 a.m.
Venue	: Online Platform
Approved CPD	: Applying
Speaker	: Mr. Ritesh Lutchman

WEBINAR - Load Flow & Motor Starting Analysis

Date	: 22 August 2020 (Saturday)
Time	: 9.30 a.m. – 11.30 a.m.
Venue	: Online Platform
Approved CPD	: Applying
Speaker	: Ir. Lee Chong Kiow

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- ☐ Engineering/Design (including chief engineer, chief designer, civil/highway/mechanical/planning engineer, other engineering/design title)
- ☐ Buying/Purchasing (including chief buyer, buyer, purchasing officer, other buying/purchasing title)
- ☐ Titles allied to the field (architect, consultant, surveyor, research and development professor, lecturer, supervisor, superintendent, inspector or other allied title)
- ☐ Others (please specify) _____

What type of organisation do you work in? *(Tick one box only)*

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- ☐ Consulting engineering/architectural/quantity surveying practice
- ☐ Mining/quarrying/aggregate production company
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- ☐ International/national authorities
- ☐ National/regional/local government
- ☐ Public utilities (electricity, gas, water, deck and harbour, other)
- ☐ Manufacturer
- ☐ Distributor/importer/agent
- ☐ Construction department of large industrial/Commercial concern
- ☐ Association/education establishment/research
- ☐ Construction equipment hire/rental company
- ☐ Project/construction management consultancy
- ☐ Others (please specify) _____

What are the main activities of your organisation? *(Tick all that apply)*

Constructions of:

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- ☐ Harbours/offshore structures
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- ☐ Pipelines/refineries
- ☐ Structures/steel work
- ☐ Building (commercial, industrial)
- ☐ Housing
- ☐ Construction management
- ☐ Deep mining

Manufacturer of:

- ☐ Construction equipment
- ☐ Cement
- ☐ Other construction materials
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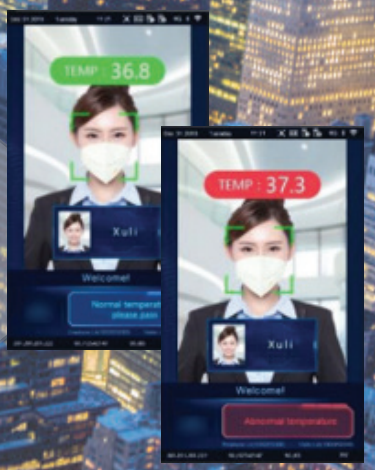

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