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IEM
The Institution of Engineers, Malaysia

JURUTERA

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WOMEN ON BOARD:
Beyond Gender Equality to Leadership

THE MONTHLY BULLETIN OF THE INSTITUTION OF ENGINEERS, MALAYSIA

JURUTERA

IEM
The Institution of Engineers, Malaysia

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cover note

WOMEN ON BOARD: Beyond Gender Equality to Leadership

by Ir. Mah Siew Kien
Chairman,
Women Engineers Section

The current trade tension between China and the US is putting Malaysia at risk from the worst effects. Prominent economist Prof. Dr Jomo Kwame Sundaram has called for Malaysians to set aside our differences, unite and work together to prepare for hard times ahead.

The UN SDG 5 is about empowering women through adopting and strengthening policies for the promotion of gender equality and empowerment at all levels. Leadership itself has no gender but needs the traits of both genders to be successful. Having more women on the board changes the dynamics. Diversity disrupts group think and leads to better decision making and better outcomes.

Engineers, in general, are good at attention to detail, problem-solving, numeracy, risk management and analysis. However, some lack emotional intelligence and the necessary leadership skills to handle new challenges from digitalisation and technology disruption. Engineers are under-represented in the boardroom of PLCs and GLCs too. The skillset and adaptability of engineers have never been more important than in the current economic climate.

Ir. Rusnida Talib will succeed me as the next Chairman and take Women Engineers Section to the next level. Together, we will build a new narrative for our nation! ■

editor's note

by Ir. Razak Yakob
Bulletin Editor

Salam & Hello All IEMers,

It is August. The Engineer's Week is here again with the Engineer's Run on 4 August as the starting point. The whole week will be filled with activities, arranged especially for all the members. Please check out our website.

I am excited with this month's issue because Women Engineers Section takes the centerstage. Reading the articles, you will realise that the market share of the softer gender in Malaysia is still lacking compared to the international standard. I believe culture plays an important role as the limiting factor and I truly believe as well that women make great engineers because of their attention to details. This is a constant global debate and you will be able to see many different perspectives in this issue.

We would like to hear from you. What you think of the *JURUTERA*, what you think of IEM, whatever that comes to your mind, like suggestions to make us better in any way as an organisation. Please write to sec@iem.org.my with the subject beginning with "Jurutera: ..."

On behalf of the Editorial Board we wish all Muslims Salam Aidil Adha which is also known as Hari Raya Korban, a symbolic day of sacrifice. We also wish all readers a Merry Merdeka Day, a day to think about the sacrifices of our forefathers and foremothers who obtained independence for our country. Our country has soared up high since then. Let's continue to engineer our country to greater heights! ■

Women on Board:
BEYOND GENDER EQUALITY TO LEADERSHIP

Gender equality is about creating a better world, not only for women, but also for men and society. Greater representation of women in organisations brings greater benefits, broadens the range of perspectives in decision-making process, stimulates critical thinking and creativity and heightens business performances and results.

To apply an inclusive gender perspective in business and other areas of economic decision-making, means to challenge prevailing top management cultures. To achieve this, intervention from the Government in formulating relevant policies is fundamental. The Board of Directors is one of the most influential decision-makers in a business. The board is accountable and responsible for the performance and affairs of the company; it is instrumental in steering the company's vision, mission and strategies, chart performance and achieve business targets. The board is also responsible for ensuring principles of good governance are practised in all business dealings. The board's own lack of diversity means that it is missing the perspectives of stakeholders and its own organisation's emerging leaders as well as potential consumers of its products and services.

There is clear evidence that companies with a gender diverse board performs far better than companies with a homogenous board. A recent global study of 21,000 publicly traded companies

Tan Sri Zarinah Anwar

Encik Noor Azmi Mat Said

Mr. Sivakumeren Narayanan

in 91 countries shows that when a minimum 30% of leadership positions is accorded to women, 6% is added to the net profit margin. But while it clearly pays to have women in leadership roles, women continue to be under-represented at the top management ranks.

In this edition of *JURUTERA*, IEM-WE shares insights from three prominent industry leaders on how embracing diversity and inclusion can contribute to the nation's progress by creating a safe space for a diverse workforce to adopt different ways of thinking, leading to breakthrough innovations, a key element to economic growth and entrepreneurship. We will delve further into the barriers that impede women's advancement to the C-suite and beyond.

IEM-WE talks to Tan Sri Zarinah Anwar and Mr. Sivakumeren Narayanan on why women board participation is imperative to represent boardroom diversity and inclusion. Tan Sri Zarinah is Chairman of the Institute of Corporate Directors Malaysia (ICDM), co-founding Chair of 30% Club Malaysia Chapter and former Chairman of Securities Commission Malaysia. Mr. Sivakumeren Narayanan is the Deputy Chief Executive Officer of Talent Corporation Malaysia Berhad (TalentCorp). TalentCorp, an agency under the Ministry of Human Resources, was established on 1 January, 2011, to formulate and facilitate initiatives to address the availability of talent in-line with the needs of the country's economic transformation programme. Malaysia is currently one of the lowest in terms of female labour participation in comparison with other countries of similar level of economic development. Encik Noor Azmi Mat Said, the Chief Executive Officer of SME Corporation Malaysia (SME Corp), the key agency promoting and driving the SME sector in Malaysia, will elaborate on the role of SME Corp and its agenda into the 21st century.

CURRENT STANDING OF WOMEN'S PARTICIPATION IN THE WORKFORCE

The Government aims to have at least 30% women representation on boards of Bursa's Top 100 Public Listed Companies (PLCs) by 2020, the year Malaysia is expected to become a "high-income" nation. According to Tan Sri Zarinah, a phased approach has been adopted in increasing gender diversity on boards of PLCs, with efforts currently focused on the Top 300 PLCs. Reflecting the government's target and the requirements of the Malaysian Code of Corporate Governance, the 30% Club's target this year is to have 30% women on the boards of the top 100 PLCs (currently 25.9%) and 18% for the Top 101-300 PLCs (currently 16.6%).

As the top 100 companies make up 85% of market capitalisation, while together, the top 300 make up 96%, "achieving the target with the Top 300 will go a long way towards achieving the objectives on gender diversity on boards of PLCs" she said.

Tan Sri Zarinah further said that, as at the end of 2018, all the Top 100 companies have at least one woman on their respective boards; 35 companies have at least 30% women and the best company has 60% women on its board. Considering all the PLCs on Bursa, the percentage is still at a low at 16%, with 296 of the total 943 PLCs having no women on board at all.

Although significant progress has been made over the years, Malaysia has yet to achieve the 10th Malaysia Plan's target in this agenda. The female labour force participation rate is the yardstick used in TalentCorp's measurement and at 2018, it stands at 55.6%. The government aims to achieve 58% in 2020. The original target of 59% was lowered to 56.5% during the mid-year review of the 11th Malaysia Plan.

TalentCorp has observed a decline in female participation at all

levels, including leadership roles, mid-management and even entry level, particularly in STEM, raising serious concerns among all stakeholders. Of the 30% women at decision-making level of PLCs, TalentCorp felt this must be imposed not only for PLCs but also government-linked companies (GLCs) and statutory bodies. TalentCorp is working with Securities Commission Malaysia to have PLCs adhere to the 30% women representation on their boards. In Q3 2018, Malaysia recorded a significant increase (15.4%) in women directors on the boards of all public listed companies, the highest in ASEAN boardrooms.

SMEs comprise 98.5% of the total business establishments in the country or 907,065 business establishments in 2015, based on Economic Census 2016: Profile of SMEs published by Department of Statistics, Malaysia (DOSM). According to Encik Noor Azmi, the definition of SME for the manufacturing sector is business with either 200 or less full-time employees, or a sales turnover not exceeding RM50 million. Meanwhile, for SMEs in the services sector, it is defined as those with 75 or less full-time employees, or a sales turnover not exceeding RM20 million. It is common to have a high number of SMEs, often more than 95% in ASEAN countries. In 2017, SMEs in Malaysia contributed 37.1% to the overall GDP or about RM435.1 billion. Current SME contribution to total exports stands at 17.3% or RM167.4 billion and a contribution of 41% to GDP is targeted by the end of 2020. As for exports, the aim is to achieve 23% SME contribution to export. "Intervention from the Government is essential to achieve these and 20.6% SMEs are led by women," said Encik Noor Azmi.

WHAT REPRESENTS GENDER DIVERSITY?

Tan Sri Zarinah said that even though the target of 30% women on boards is the minimum percentage, at the end of the day there should be gender equality where efforts go beyond achieving statistics and where men and women are recognised and valued, irrespective of gender.

"It has taken a vast amount of effort to get to where we are today. We have undertaken a lot of advocacy work, engaging particularly with the chairmen of boards and of nomination committees to raise awareness on the importance of gender diversity and we are working with investor groups as well as with the HR community to assist with building a pipeline of talented women who can be developed and groomed for board positions. But challenges remain, especially in reference to mindsets and comfort level of the 'boys club' at board level and the inability or disinclination of many to value gender diversity as a strategic business imperative," she said.

She added that many studies have shown that a gender-diverse board leads to improved problem-solving abilities due to diverse opinions and perspectives and "group think" elimination. This makes for better risk management. Thus, diversity is a key element of good corporate governance and investors are holding boards to account on this.

Mr. Sivakumeren concurs that more champions of female leadership are needed. Meanwhile, it needs to be championed by men who make it a conscious effort to ensure enough female participation driving it from top management. The government can only do so much to encourage and it is equally important for associations and NGOs to strongly encourage more female representation at board level and to become the "voice" for women in the organisation.

CHALLENGES OF ACHIEVING GENDER DIVERSITY

Bursa data suggests that there are sufficient women who are board-ready; however, without the Government's intervention and push, Malaysia may only reach 30% women on board representation in 2099.

Tan Sri Zarinah said that many companies do not regard gender diversity on boards as a strategic business issue and so they pay little or no attention to this. There is a prevailing view among some that women are not ready nor are there women who are ready to fill board positions despite the database of qualified women. While some chairmen and CEOs recognise the benefits of having women at the board table, the process is left to happen on its own and, in companies with an entrenched culture and distinct lack of women role models at the top, there is a lack of intervention or systemic support to drive inclusiveness.

Then there are women who underestimate their own capabilities and influence. It is a fact that women bring to the board unique attributes and competencies and contribute value, so Tan Sri Zarinah advocates that women must prepare themselves to step forward to be considered for senior leadership positions. It is important that successful women mentor and help other competent women rise to the top.

She said the engineering industry is no different from other industries. While female enrolment in the universities is at 65%, this has not translated into a higher rate of representation in leadership roles. A proportionate rate of women enters the workforce, but there is a drop at middle management and a sharper decline in the top management. This just shows the need for top level commitment on the diversity agenda; chairmen and CEOs must make gender diversity a component of their business strategy and ensure appropriate policies are in place to retain, develop and promote women to senior roles.

Both ICDM and TalentCorp are working with HR managers to help build the female talent pipeline and to develop HR policies and practices needed to attract, recruit and retain women. HR personnel must be well trained in the hiring and promotion process. Women have multiple roles to play and even today, this has not changed. Women have to manage competing demands on their time and continue to bear the heavier burden of domestic responsibilities including caring for children and the elderly. Therefore, companies must step in to assist with facilitative policies or they will lose the value that

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CHALLENGES OF ACHIEVING GENDER DIVERSITY IN STEM

In STEM, there are 75% women in human health and social profession and 48.9% in scientific and technical professions. Thus, according to TalentCorp, it is inaccurate to conclude that women are under-represented in STEM.

Of course, the statistics on female participation vary in different scenarios, such as universities vs workforce, in leadership positions and in different fields such as engineering. The Nurturing Expert Talent (NEXT) initiative is a proprietary assessment system to help students identify their strengths, passion and career choices that are most suited to their skill sets with an accuracy of about 98%. Female students should be exposed to more female world leaders for inspiration.

To advance women's economic inclusion, TalentCorp concurs that supportive women's groups, similar to IEM-WE, should be formed within organisations. The female group needs to champion the voice of women, using the group as a platform to advocate the need for women empowerment and leadership so that changes can happen from top management. Women should push themselves into leadership positions and female representation must be made an agenda on HR policies. In the corporate world, CEOs should set strategies and KPIs on diversity and inclusion. The board should be conscious of the decision-making process involving women employees.

ON LEADERSHIP

Mr. Sivakumeren says that the new leadership will be about knowledge and the ability to understand problems, with continuous learning. To be successful in the new era, one needs to feed oneself with constant knowledge of the industry and latest technology enablers. It is about formulating design and putting all the pieces together. In one word, new leadership is about "innovation".

Engineering is a male-dominated industry. Only about 20% of working engineers are female. Since the number is not there to begin with, there are currently only a handful of female engineers holding leadership positions in engineering companies.

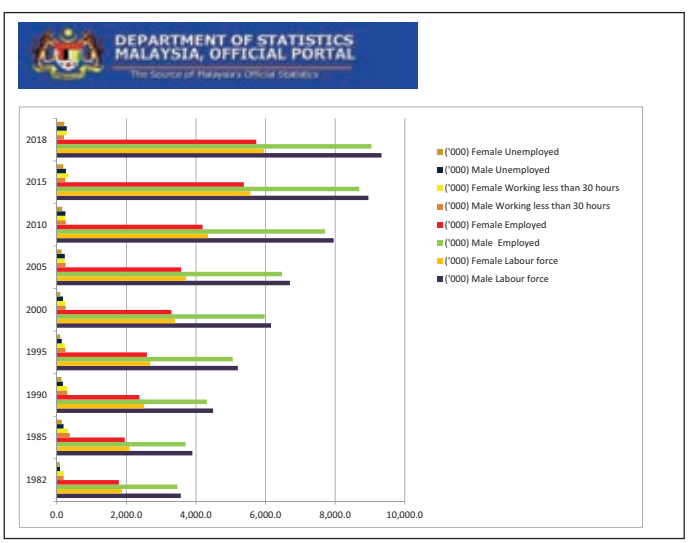
Tan Sri Zarinah said there are efforts being pursued, for example by the 30% Club, to create opportunities for more women in leadership positions and to groom and prepare women to assume board positions. "We are able to assist boards with recruiting competent women to fill vacancies; in fact, we have been able to place women engineers on boards of engineering companies. So there really is no excuse to say there are no suitably qualified women to appoint, including engineers," she added.

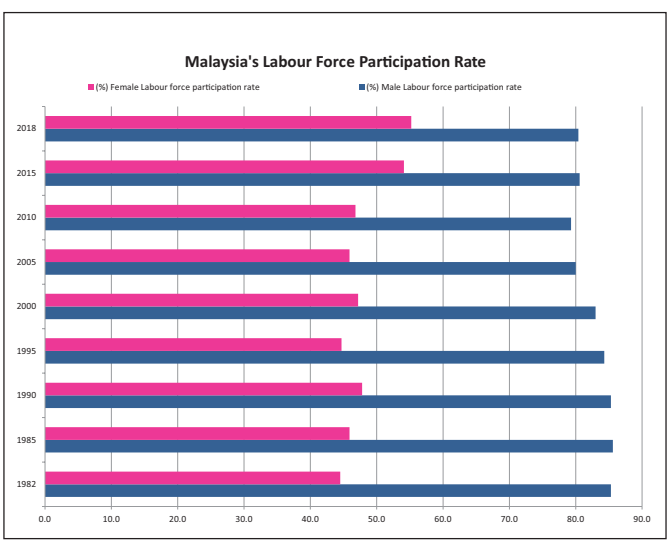
NATION'S SUPPORT TO REALISE THE VISION

TalentCorp provides free basic coaching and technical assistance for companies that want to study and adopt the implementation of flexible work arrangements to attract female talent. Many MNCs have adopted various work-life practices and this has been challenging especially for SMEs. TalentCorp's annual LIFE AT WORK awards especially recognises companies with exemplary practices to promote diversity and inclusion in the workplace.

It also organises Career Comeback Workshops where women on career breaks can gain insights on how to rebuild their CVs and to attend interviews successfully. They are connected to recruiters and potential employers and this includes engineers. All the engineers in its database have already been placed in the workforce and TalentCorp is certain that there is a large group of engineers still available. Hopefully, this article will encourage more women engineers to register with IEM and be in the database. Companies registered with TalentCorp offer flexible work arrangements and have best practices that lean towards retaining female talent.

TalentCorp further elaborated that modern technology enables many flexible work arrangements, including the "work from home" concept. Women tend to leave the workforce to





Source: Dept of Statistics, https://www.dosm.gov.my/v1/index.php?r=column/ctimeseries&menu_id=NHJlaGc2Rlg4ZXlGTjh1SU1kaWY5UT09

Flexible work arrangements are arrangements that aim to provide greater flexibility in the following areas: the workplace, scheduling of hours worked, number of hours worked and flexibility of job roles.

Work-life benefits are company-sponsored incentives to support employees in achieving better work-life integration.

Source: TalentCorp

care for their families – children and ageing parents. However, they can still contribute by working from home. The extension of maternity leave as unpaid leave or the ability to clock in remotely will also encourage more women to stay in the workforce. Unconscious gender bias during recruitment process is also an important aspect to be addressed and eliminated.

Tan Sri Zarinah, the co-Founding Chairman of 30% Club since its inception here in 2015, said the 30% Club helps drive higher levels of women representation in leadership positions and on corporate boards. It originated in the UK and was built on the belief that having at least 30% women at top management and on boards makes good business sense. It made its debut in Malaysia to facilitate the achievement of the gender diversity target in the corporate sector, particularly among PLCs.

The 30% Club, together with ICDM and LeadWomen (a consultancy on gender diversity), have established various programmes to build and develop skills and professional competence of potential women candidates. They run training and development programmes as well as mentoring programmes to groom women for board positions and to increase their visibility. They also maintain a registry of qualified and competent women board candidates and offer placement services to help PLCs fill vacancies on their boards with suitable candidates. They run engagement sessions with chairmen of boards and nomination committees to align them on the business case for gender diversity and work with companies to develop a strong pool of C-level women to fill the talent pipeline and to ensure a sustainable supply of board-ready women. Many of the women candidates on the registries have been successfully evaluated, trained and undergone mentorship to prepare them for board positions.

CONCLUSION

The McKinsey Global Institute estimates that equality in the job market will yield an additional £20 trillion to global GDP by 2025. However, what cannot be measured in the absence of this, are the lost ideas, unrealised dreams, businesses never built and opportunities missed. There is an urgent need to integrate gender equality in our work across the board, thereafter track delivery through results via financial performances.

Encouraging women to take on leadership positions will have little effect if this is not backed by government and company policies that make it possible for women to combine a career with family life. A higher percentage of women in the workforce means higher generation of wealth, more taxes paid and therefore better public services and welfare. In her headline speech at the UN commemoration of International Women's Day, Hillary Clinton said that equality for women "remains the great unfinished business of the 21st century".

"No country in the world, including my own, has achieved full participation," she added. Even with such focus on women around the world, women leadership is still considered a "work in progress", even in the most developed nations. According to Forbes, while 47% of the workforce in the United States are women, the percentage of women in senior leadership as well as C-level roles, continues to stagnate. Similarly, women are still under-represented on boards and in the C-suite in Asia. ■

ENCOURAGING MORE WOMEN IN STEM ACADEMIC & RESEARCH

Assoc. Prof. Dr Zahiraniza Mustaffa

The topic of women under-representation in STEM fields in Malaysia has been of interest in the past few years. While the public should know the current status, the efforts being taken to deal with this issue may not have been explicitly discussed.

While facts and figures presented here are not fully comprehensive or exclusive enough to debate the details, this article serves as a platform for developing a preliminary understanding among young Malaysian engineers on the efforts made in the past, challenges that are being overseen at present and concerns over what may possibly impact the future.

THE PAST

The changing landscape of foreign governance prior to Independence had helped paved the way for public awareness on the importance of and necessity for technology development and enhancement. Past experiences under the different colonial masters had provided us with valuable lessons that "knowledge and know-how" in technology were necessary.

While being under different colonial administrations may have had a negative impact on the country and its people at times, it did allow an indirect transfer of knowledge at other times.

Steps to bridge the shortfall of women's involvement in STEM in our education system started as early as 1949. Science and natural science subjects were included in the curriculum for primary and secondary schools from 1949 to 1956. After Independence in 1957, one of the earliest and main initiatives implemented by the government in 1970, was to align the school system as well as that of higher institutions to achieve a target of 60:40 ratio for students' enrolment in Science and Arts. However, in 2017, after almost 47 years of implementation, a ratio of 42:58 was reported, which was far from the targeted ratio.

From 1971 to 1975, the Second Malaysia Plan was introduced, enhancing new STEM school systems to be represented in the form of Residential Science Schools, Girl's Residential Science School and Girl's Schools.

For Residential Science Schools in particular, this was further expanded to another three categories: Science Secondary School, MARA Junior Science Colleges (MRSM) and Religious Integrated School. At the time of initiation, there were 10, 2 and 4 of these schools respectively. By 2017, when cross comparing to the Second Malaysia Plan, the number of these schools had increased to 69, 51 and 12 for Science Secondary Schools, MARA Junior Science Colleges and Religious Integrated Schools respectively. However, the number of Girl's Residential Science Schools had also only increased to 6.

THE PRESENT

While governance and policies have been put in place to encourage young girls to be involved in STEM fields, moulding matured women leadership is still a challenge. Particularly in STEM fields, more women are needed in research to increase the range of inventions and breakthroughs that will come from looking at problems from a different perspective.

Does the lack of women in STEM related research make a difference? Definitely. For a start, women are usually more socially aware than men. Women foster good relations in building a community and creating an inclusive environment, while men tend to take on leadership and just make things happen. Adding a woman's emotional skills into the mix can compensate for this and allow research knowledge to expand further.

Therefore, accessibility to higher education is a pre-requisite for women to make an impact in the research agenda. To achieve a leadership position, a woman has to overcome not only content (expertise in her discipline) but also her leadership styles.

A role model for Malaysian women, Malaysian astrophysicist Datuk Dr Mazlan Othman, once observed: "Women have two problems: One is the lateral glass, and the other, the glass ceiling. You must show your talents in different fields. You must not only be a good scientist but also a good administrator. Sometimes women are denied, not upwardly but laterally."

When women are under-represented in leadership positions, this becomes a problem because then, the collective opinions of women are less likely to be represented in the country's policies and in the decision-making process.

With greater accessibility to higher education today, women have made significant achievements in scientific disciplines. If women scientists are not visible or are not seen to succeed in their careers, they cannot serve as role models to attract young women to the scientific profession.

That women are under-represented is reflected in the small pool of women research icons. This results in a smaller pool of women moving to the top as role models and mentors, so young women will not have many female role models or mentors to give advice and motivate them with positive attitudes, to boost their self-confidence and self-efficiency and to teach them discipline in working smart. Without all these, young women scientists are not likely to venture into STEM or hard core type research.

Acknowledging this, the government has, for instance, proposed several initiatives to inculcate the culture of research and development (R&D) among academics through the Malaysian Budget 2010. Y.Bhg. Datuk Prof. Dr Asma Ismail, during a visit to Universiti Teknologi PETRONAS (UTP) in 2016, further shared the aspirations of the government which are aimed at:

- Intensifying Research, Development and Commercialisation.
- Developing Green Technology.
- Enhancing Highly Skilled Human Capital (to develop intellectuals in Science and Technology).

These, perhaps, will open more doors to allow more female researchers to kick-start their work in R&D.

The issues and challenges of women under-representation in leadership roles should be addressed and strategically planned. With all these and input from the Ministry of Women, Family & Community Development, the Malaysian Cabinet has approved a policy to ensure that 30% of decision-makers in the private sector are women and companies are given a five-year transition period to increase the number of women members in their board of directors and to hold top positions.

In Malaysia, most research institutions in public as well as private universities, have welcomed this agenda wholeheartedly. More women leaders holding higher management positions are being envisaged. Reports of such success stories, complete with statistics, should be made available to the public annually. Where and when necessary, challenges and grievances should also be discussed, in order to improve the system and the way forward, with strategic plans accounted for accordingly. TalentCorp Malaysia is one of the institutions which have been frequently reporting matters related to the women workforce since 2010.

The next question then, will be: "How do we measure the impact of women leaders vs women in lower positions?"

THE FUTURE

The waves of The 4th Industrial Revolution have penetrated the country but are Malaysians ready to take up the challenges of the future? Different strategies and initiatives may be in place, coupled with the necessary potential measures, to gauge its success from time to time. Last year, the official portal of MASTIC (Malaysia Science & Technology Information Centre) released the five-year (2013-2018) Global Innovation Index (GII) for Malaysia.

Used to measure the innovation performance of approximately 127 countries and economies around the world, GII helps to create an environment in which

innovation factors are being continually evaluated. According to GII 2018, Malaysia ranked 35 (43.16%), an improvement from its ranking of 37 (42.72%) the previous year. This may be attributed to enhanced STEM research, which has led to the birth of many new science and technology innovations in the country.

A detailed statistical record showing population growth was compared for a random selection of years, i.e. 1980, 2016 and a projection for 2050 (See Figure 1).

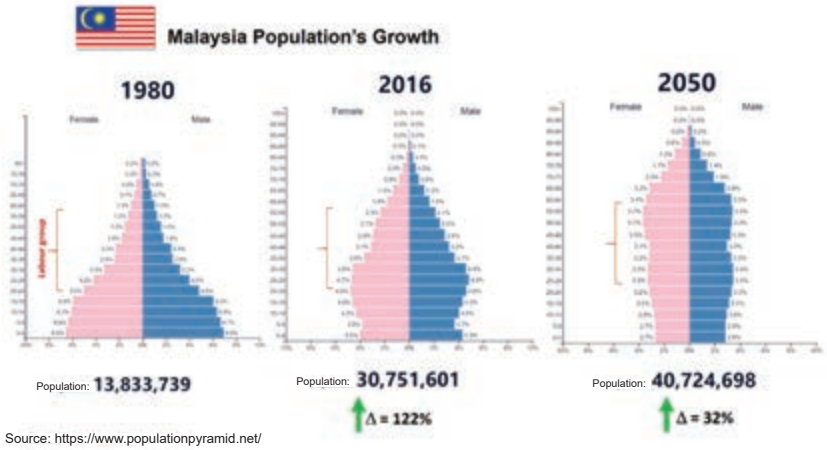


Figure 1: Population growth in Malaysia for years 1980, 2016 and 2050

Past efforts made by the government (as presented earlier) could be considerably taken by the labour group of 20 to 60 years of age. From Figure 1, there was a tremendous increment in population from 1980 to 2016, with a positive growth of 122%. However, the number has been forecasted to slow down with an increment of only 32% by 2050. This is worrisome in the context of STEM development and presents the following concerns:

- Will a decline in population lead to fewer technology innovations?
- Will lower numbers in future impact STEM strategic plans of the country?
- What will women representation in STEM be like in future?
- Will fewer children in a family mean better performance for women in STEM careers? ■

Author's Biodata

Assoc. Prof. Dr Zahiraniza Mustaffa *is a Committee Member of Women Engineers Section. She is an Associate Professor at the Department of Civil and Environmental Engineering, Universiti Teknologi PETRONAS.*

Upcoming Activities
SEPTEMBER - OCTOBER 2019

2-Day Course for Project Management Foundation and Practices: For Managing Electrical and Electronics Projects

Date	:	10 – 11 September 2019 (Tuesday - Wednesday)
Time	:	9.00 a.m. to 5.30 p.m.
Venue	:	Wisma IEM
Approved CPD	:	Applying
Speaker	:	Ir. Dr Mui Kai Yin

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FEATURE

WOMEN IN LEADERSHIP ROLES: RESPONSIBILITY AND A CONSCIENCE

Dr Habibah @ Norehan Haron

The new millennium has seen a lot of changes in the leadership scenario in relation to women. Today, women in leadership positions are more common and this is in line with the country's national agenda. Professional organisations, private and public organisations, non-profitable and volunteer organisations... each has a different mission and work environment. Each has its own challenges and relevant leadership approaches.

In this article, we talk to 2 women leaders. One is a specialist medical practitioner who runs a private clinic, leads a humanitarian organisation and has made high risk missions to help save lives.

The other is an engineer who, after spending a few good years in the field, has made her way up the ranks and developed a training institute which not only generates income for the parent organisation, but also leads the establishment to a successful peak.

The questions we asked these women were: What challenges did they face? What support did they need? What efforts have they made, as leaders, to help other women become leaders? What are their leadership styles? What are their key success factors in leading the organisations?

Dr Fauziah Hassan (2nd from the right) with Syrian orphans in Istanbul

There were some common responses, particularly in relation to the challenges and type of support they valued. Among the challenges common among working family women are having to take on multiple roles as wife, mother, daughter and employee or employer, and the cultural expectations that they should conform to.

Both women talked about juggling roles to maintain a work-life balance, which is a constant in the equation. This is particularly so in a leadership position where much of one's time is spent at the workplace or having to travel within the country and abroad. It is never easy and not without sacrifices on their part and on others close to them, particularly their families.

Another common challenge is the attitude of people they work with, either as a colleague or employee. In a humanitarian organisation, leading volunteers is easier than leading paid employees because generally, volunteers who have signed up are passionate about the cause and are willing to go to all ends. As for corporate organisations, the competency of employees and even gender bias at the workplace are challenges that need to be addressed.

It is most important that a career woman has the support of her spouse. An understanding and supportive spouse is essential for any woman to excel in her job or at the workplace, particularly in Asian culture. Dr Fauziah Mohd Hassan, a gynaecologist and leader of Rose To Rose (the women's wing of a humanitarian organisation) said: "I owe this (successful leadership role and humanitarian missions) to the strong support from my spouse, my family, my chairman, my Board of Trustees, staff, friends and fellow Malaysians."

She had been in many humanitarian missions with MERCY Malaysia, travelling to war-torn countries and disaster areas such as Kosovo (1999), Maluku Indonesia (2000), Afghanistan (2001, 2002, 2003), Aceh (2005), Pakistan (2005), Gaza (2009, 2012), Women's Boat To Gaza (2016) and Cox's Bazar (2017).

Meanwhile, Ir. Dr Khalidah Haron identified cooperation, trust and authority as the kind of support women need to carry out their leadership roles effectively, particularly in

the corporate sector. After she graduated from Brighton Polytechnic, she worked as an electrical engineer at Lembaga Letrik Negara (LLN) and then at Tenaga Nasional Berhad (TNB) until her retirement as the Managing Director of TNB Integrated Learning Solution (ILSAS) in 2013. ILSAS, the training and consultancy arm for TNB, was established in 1978 and incorporated as a subsidiary of TNB in September, 2008. Ir. Dr Khalidah has played a vital role in the development of ILSAS to what it is today.

The success of an organisation is the responsibility of its leaders. Ir. Dr Khalidah was motivated to lead ILSAS in order to be able to make changes in the organisation. In the past, gender bias was quite apparent, so the changes she brought about included mentoring and coaching other women to fill leadership positions. She strongly believed in making a difference.

As for Dr Fauziah, she felt it was her responsibility, as a medical doctor, to provide humanitarian services. She had a strong conscience to be on the ground where help was needed. Though it was not her desire to be in a leadership position, the role was thrust upon her and she carried out the responsibility to the best of her abilities, because "there was so much that needed to be done – to liberate Palestine, Syria, Kashmir, Uighur and our society too".

She helps other women to become leaders by encouraging them, especially the younger ones, to be involved in the many activities, starting with smaller programmes and slowly growing their confidence as leaders. As an advisor, Dr Fauziah provides them with the opportunity to appear on television and other media.

Both women may have different emphasis when it comes to leadership styles but they are aligned with the nature of their organisations. Dr Fauziah highlighted the importance of acknowledging contributions from others such as those who had helped at the frontlines and behind the scenes. Especially in a humanitarian organisation, she said, her successes and achievements should be shared with the people who supported her work. When she received awards, she would remind herself to tell them that she was "receiving it on their behalf".

On transformational leadership, Ir. Dr Khalidah said the only constant here is change. She preaches and practises "begin with the end in mind" and stays focused on and with the cause of the organisation. Describing herself as task-oriented, she added: "I practise the right fit for a job. Fitting skills to job. Fitting emotion to job. Fitting passion to profession. Training a person is based on job evaluation, prior to interviewing for new recruits or promotions. If one is not fit, re-skill and, if not trainable, re-assign. I work for the organisation, so it (the organisation) comes first."

Ir. Dr Khalidah Haron's retirement activities help her maintain her work-life balance

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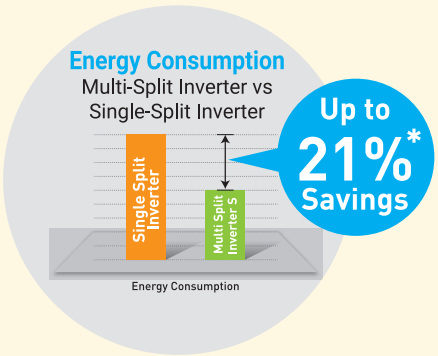

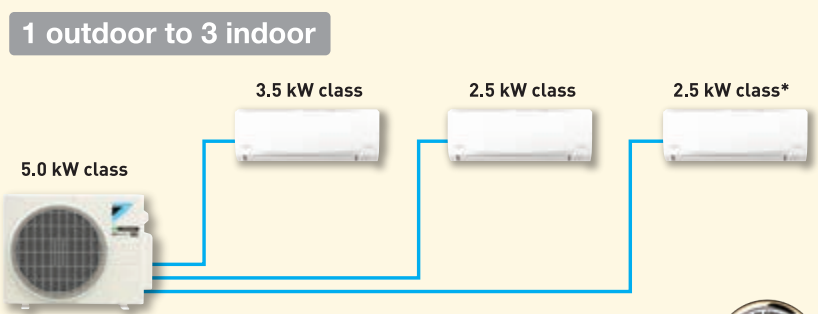

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Ir. Dr Khalidah Haron's retirement activities help her maintain her work-life balance

With regards to the "key success factors" for women in leadership positions, Dr Fauziah said women have lots of scope for improvements, including training opportunities. Particularly in a humanitarian organisation, one necessary skill to have is a high sense of empathy for the people around, from staff members to beneficiaries.

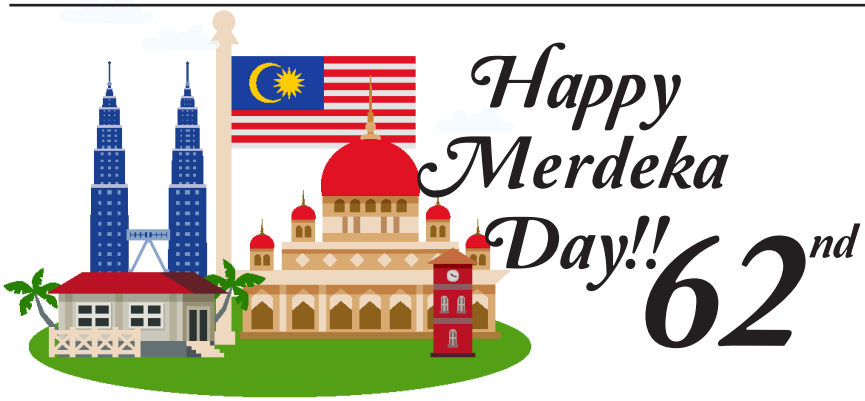
As for Ir. Dr Khalidah, the three main success factors she singled out as "key success factors" were ethics, competence and guts, with emphasis on human capital development and competency.

Finally, leadership is about responsibility and conscience decisions. Whether leading a humanitarian or corporate organisation, the types of challenges and support are somewhat similar.

According to the 2 women, being a successful leader is not about the job title or designation but rather, it is about one's skills sets. Women have a lot of advantages over men as agents of change through their natural 'affective' skillsets. But women must first remove their own barriers and fears, gain confidence and may need to be 'hungry' enough to want to move forward in order to become leaders who can make a positive difference and have an impact on society. ■

Author's Biodata

Dr Habibah @ Norehan Haron *a committee member of Women Engineers Section, IEM, is a senior lecturer at Engineering Department, Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia.*



FEATURE

RC DRONES: A BRIEF OVERVIEW

Dr Umran Abdul Rahman

Ir. Assoc. Prof. Dr Mohamed Thariq bin Haji Hameed Sultan

The word "drone" means something that hums, such as bees. However, in recent years, it also means a pilotless, Remote Control (RC) aircraft or missile.

In this article, we talk to 2 women leaders. One is a specialist medical practitioner who runs a private clinic, leads a humanitarian organisation and has made high risk missions to help save lives.

The aircraft can be either lighter than air, fix-wing, rotary wing or more notably, can have a number and arrangement of smaller propellers comparative to the craft size. Piloted remote-control devices have evolved since the late 19th century when hydrogen-filled model airships were flown in a music hall using a basic form of spark-emitted radio signals.

Over the years, the advances made in radio signal processing have seen more and more advanced radio-control systems with almost limitless proportional control channels made possible in what we now see in today's RC drones.

The word "proportional" carries an important meaning here. For example, how many control channels are required in a typical fix-wing aircraft? In the most basic form, we need to control something that flies in 3-dimensional space with 6 degrees of freedom i.e. 3 translational and 3 rotational. To do this, the aircraft is fitted with elevator for pitching up and down, rudder for yawing, ailerons for rolling and some form of thrust producer in translating the aircraft forward.

Altogether 4 types of controls are required and all these need to be precisely controlled with the exact amount of output per given amount of input. This is where control proportionality comes in. In other words, the control in terms of on and off, is not going to cut in.

The difference between pilotless and piloted remote-control aircraft is that the latter is controlled manually by the person holding the transmitter while the former flies via commands through a prescribed program or algorithm.

Is control alone enough? No. Another element that is needed is stabilisation. As mentioned, to fly in a 3-dimensional space which is exposed to environmental conditions, an aircraft can be un-stabilised at any time. Typical fix-wing design with high wing at the front and tail feathers at the back will have high inherent stability but the same cannot be said about rotary wing or multiple copter aircraft. Even with the high inherent stability of a fixed wing aircraft, it is actually leaning towards passive stability, i.e. once disturbed from its current altitude, it will immediately take the latest altitude and only after a prolonged period will it go back to its original altitude. Depending on how high the initial altitude is prior to the disturbance, the aircraft may crash to the earth before it recovers.

For a piloted fix-wing aircraft, an ample time window will allow the ground pilot to dial in correction inputs to stabilise the aircraft. For a non-fixed-wing aircraft, the time window for correction input is too short for a human to react in time and it is only made possible with an artificial stabilisation system.

Take helicopters for example. The primary rotor blade rotational reaction on the fuselage will change rapidly if a gust or side wind impacts the blades, resulting in fuselage yawing if the tail rotor fails to react in time to correct the heading. Typically, this small tail blade pitch angle adjustment is achieved automatically via input from the tail gyro which senses the fuselage rotation torque.

Similarly, if the primary blade pitch angle is changed by the pilot, the resultant reaction torque on the fuselage will change as well and the correction of the tail blade is needed if the heading of the fuselage needs to be maintained. Again, the time window is simply too small for humans to react accordingly, especially when climbing out from hovering or from small forward speed.

The gyro mentioned here is an artificial stabilisation system only in a one dimensional plane; over time, it has evolved from rotational mass down to inertia-based gyros and currently, in the actual aircraft world, optic-based gyros. Just touching the base on these optic gyros, a single light source is split into two opposing beams projected into a single fibre optic coil at each end. The time for the light to return is the same if there is no rotational acceleration along the optic coil axis but it'll be different otherwise. This effect is known as Sagnac Interference, thus named after Georges Sagnac, a French physicist. The measured difference in time or error is used as a signal for flight correction.

For lateral and longitudinal stability of fix-wing aircraft and helicopters (to a certain extent), the pendulum effect (primary mass being hung at the bottom) creates an additional time window for humans to make corrections accordingly. For multi-rotor crafts however, there is basically no built-in stabilisation whatsoever and successful flying has been made possible only recently with the availability of 3-dimensional stabilisers. All 6 degrees of freedom need

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not only be controlled but also stabilised. Any uncalled for translational or rotation acceleration will be countered within milliseconds and therefore static hovering and lateral flying is then possible.

In general, control of a multi-rotor craft is via the adjustment of the rotational speed of the propeller. For example, a quad rotor achieves yawing stability via counter rotating pairs of the 4 propellers. It also achieves lateral and longitudinal stability via the adjustment of propeller speed through a much more complex stabilisation algorithm from on-board 3-dimensional rotational and translational acceleration sensors. It becomes complex as the changes of propeller rotation will also change the reaction torque; thus yaw will occur if we desire only yaw control. It seems to be enough but any reduction or increment of propeller speed will also induce reduction or increment of the thrust, resulting in lateral imbalance of the craft. This is where the milliseconds of stabilisation controls come in to counter the ill effects.

For a pilotless aircraft, the flight trajectory and path will be autonomous. Although we can see only a small piece of circuit board in these autonomous crafts, they are actually full-blown computers that are able to perform complex calculation functions based on the flight path mission inputs.

Apart from the stabilisation sensors for any real-time stabilising work, it also requires input from current position, air speed and altitude. Currently the best air speed feedback system is still the pitot pressure adopted for drones.

Similarly, altitude will also be using pressure altitude system although changes in altitude will be a little slow to be recognised (for real aircraft, given the same time, the height difference and the ambient pressure difference are quite large, for small UAV however, the height difference is relatively small).

The option to use radio altitude is available today but this is quite limited in terms of usable height. Certain advance systems may use a triangulation of the GPS signal to determine not only the current position in space but also its current height above the land surface. With all these inputs, the mission can then be executed following the required trajectory and height.

From the above, any high-end autonomous craft can be fully un-linked from the ground once the ground station has transmitted the flight mission. In the real world however, many operators will continue to link up as continuous system health monitoring of flight path, height, fuel quantity, operating temperature and other system parameters require manual observations. Not only that but a manual takeover of flight will be required in case the auto flight system fails, especially when flying over populated areas. This, at times, limits the operation radius of the flight vehicle.

We have advanced far in the development of RC drones. In time, with additional system redundancy and failsafe modes, the endurance and operating radius will be even bigger and sightings of a UAV flying overhead will be a common thing. ■

Authors' Biodata

Dr Umran Abdul Rahman *is an engineer with Malaysia Airlines. He is also engaged in consulting work on UAVs for UPM, open source CFD system implementation in UMP and engaged by an independent contractor to perform aerodynamic analysis on the UAV platform.*

Ir. Assoc. Prof. Dr Mohamed Thariq bin Haji Hameed Sultan *is director and head of Aerospace Manufacturing Research Centre at Faculty of Engineering, UPM Serdang, Selangor. He is also an Independent Scientific Advisor with Aerospace Malaysia Innovation Centre.*

Upcoming Activities
SEPTEMBER - OCTOBER 2019

1-Day Course on Project Schedule Management

Date	:	18 September 2019 (Wednesday)
Time	:	9.00 a.m. to 5.30 p.m.
Venue	:	Wisma IEM
Approved CPD	:	Applying
Speaker	:	Ir. Faizal Abdullah Sanusi

Half-Day Course on Macro Synthetic Fibre Reinforced Concrete for Tunnelling and Underground Structures

Date	:	21 September 2019 (Saturday)
Time	:	9.00 a.m. to 1.00 p.m.
Venue	:	Wisma IEM
Approved CPD	:	6
Speaker	:	Dr Ralf Winterberg

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FORUM

INTERNATIONAL WOMEN'S DAY 2019 #BALANCE FOR BETTER

WOMEN ENGINEERS SECTION

reported by

Ir. Mah Siew Kien

Assoc. Prof. Dr Zahiraniza Mustaffa

Ir. Noorfaizah Hamzah

Ir. Tan Loo Yen

IEM team and student volunteers from UNITEN, USM, UTP and UKM

To mark International Women's Day 2019, Women Engineers Section (WES) co-organised two major events, one each in the Klang Valley and Penang. This year's theme for International Women's Day, Balance For Better, is aimed at encouraging gender parity in social, political, cultural and economic sectors of the society.

On 17 March, 2019, a one-day public forum, co-organised with Sunway Medical Centre, was held at SunMed Convention Centre, with a wide range of activities for the public. Participants were treated to Zumba fitness, a hospital tour, STEM activities and a piloxing session. In addition, Dr Sangeeta Kaur, founder of Emerging Journey Asia, gave a talk on gender and social inclusion.

Today, with more women and disabled individuals coming out to join the workforce, gender and social inclusion are areas that the organisation is looking at. According to Dr Sangeeta, there are five types of inclusion.

1. Community – Social Inclusion is physical, emotional, intellectual, spiritual and a quality of life.
2. Connection – Emotional Inclusion is beyond physical presence and into relationships.
3. Contribution – Intellectual Inclusion is the dignity of contributing to the community.
4. Contemplation – Spiritual Inclusion is the pursuit of meaning and purpose.
5. Comprehensive – Comprehensive Inclusion happens in good health, quality of life and, when necessary, a cure.

Dr Sangeeta said inclusion is one of challenges that organisations are facing today. We, as human beings, will have biases and stereotyping due to upbringing,

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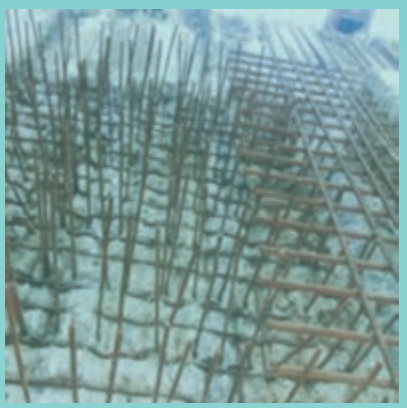

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Students building a mini DIY pneumatic lifter to demonstrate that by using air, it is possible to provide a linear force capable of lifting a small object

environment and experiences. Even a tiny bit of bias will definitely contribute toward consequences in gender and social inclusion. She emphasised the need to look at ourselves and to evaluate our personal biases and stereotypes which may influence the gender and social inclusion in an organisation and added that we must not forget the five different types of inclusion mentioned above.

The hospital tour arranged by Sunway Medical was very impressive and enlightening for the participants, especially with regards to the latest medical equipment. For this event, our objective was not only to celebrate the achievements of women but also to promote women in all fields of science and engineering, starting with the young and STEM activities. Public awareness in health and the overall networking with people from all industries concluded the day's event.

WES also collaborated with the Penang Women's Development Corporation (PWDC), Tech Dome Penang and Intel Technology, for the event, Women in Zcience (WiZ) 2019, on 9-10 April. Participation in WiZ helped make WES more visible and for it to gain recognition in conveying the aspirations and message on the importance of STEM.

WES was provided with a booth to showcase our events, programmes and engineering display models. These engineering models were indirectly supported by the Universiti Teknologi PETRONAS (UTP) and Universiti Teknologi MARA (UiTM) as collaboration efforts from the committee members.

As part of WES's contribution, a 2-hour Young Engineers Workshop was conducted, with six different activities – dynamics, flying contraption, vertical wind turbine, popsicle stick bridge, pneumatics and recycled bottle diver. These activities covered various engineering disciplines such as mechanical, renewable energy and civil engineering.

The 200 students involved were required to perform a minimum of 5 activities to complete this workshop. By engaging with these students, WES clearly sparked their interest in STEM and gave them an overview of the different

fields of engineering. Student volunteers from UNITEN and USM also engaged with the students and, in the course of performing the tasks as required, the latter had to put on their thinking caps, engage in problem solving and were exposed to a basic understanding of engineering principles, while having a fun-filled time. The workshop was made possible by the leadership and guidance of Mr. Chua Yaw Long, Chairman of IEM STEM Promotional Sub-Committee.

The two-day event brought together some 750 students from 9 schools in Penang. The students were of different ages and came from primary and secondary school to post-secondary institutions.They participated in self-guided and guided educational tours.

Ir. Mah Siew Kien, Assoc. Prof. Dr Zahiraniza Mustaffa and Ir. Noorfaizah Hamzah represented WES at the IEM booth exhibition and offered explanations of the posters and models on display.This proved to be a successful strategy that exposed the audience to the different learning experiences, following which the students showed a greater willingness to discover new things and a keen interest to know more about the displayed models.

Taking part in the various indoor games and challenges also gave them a different perspective of science and engineering. For the duration of the programme, the self-guided explanation regarding IEM and the execution of STEM activities were carried out by student volunteers from Universiti Tenaga Nasional (UNITEN), Universiti Sains Malaysia (USM), Universiti Teknologi PETRONAS (UTP) and Universiti Kebangsaan Malaysia (UKM).

WES aims to continuously raise awareness of and to increase interest in opportunities for women in the science and technology sectors. Through activities and collaborations, WES hopes to encourage the young generation of females to be game changers in STEM. This also ties in with our overall objectives as laid out at the WiSET conference to promote the advancement of women in STEM. ■

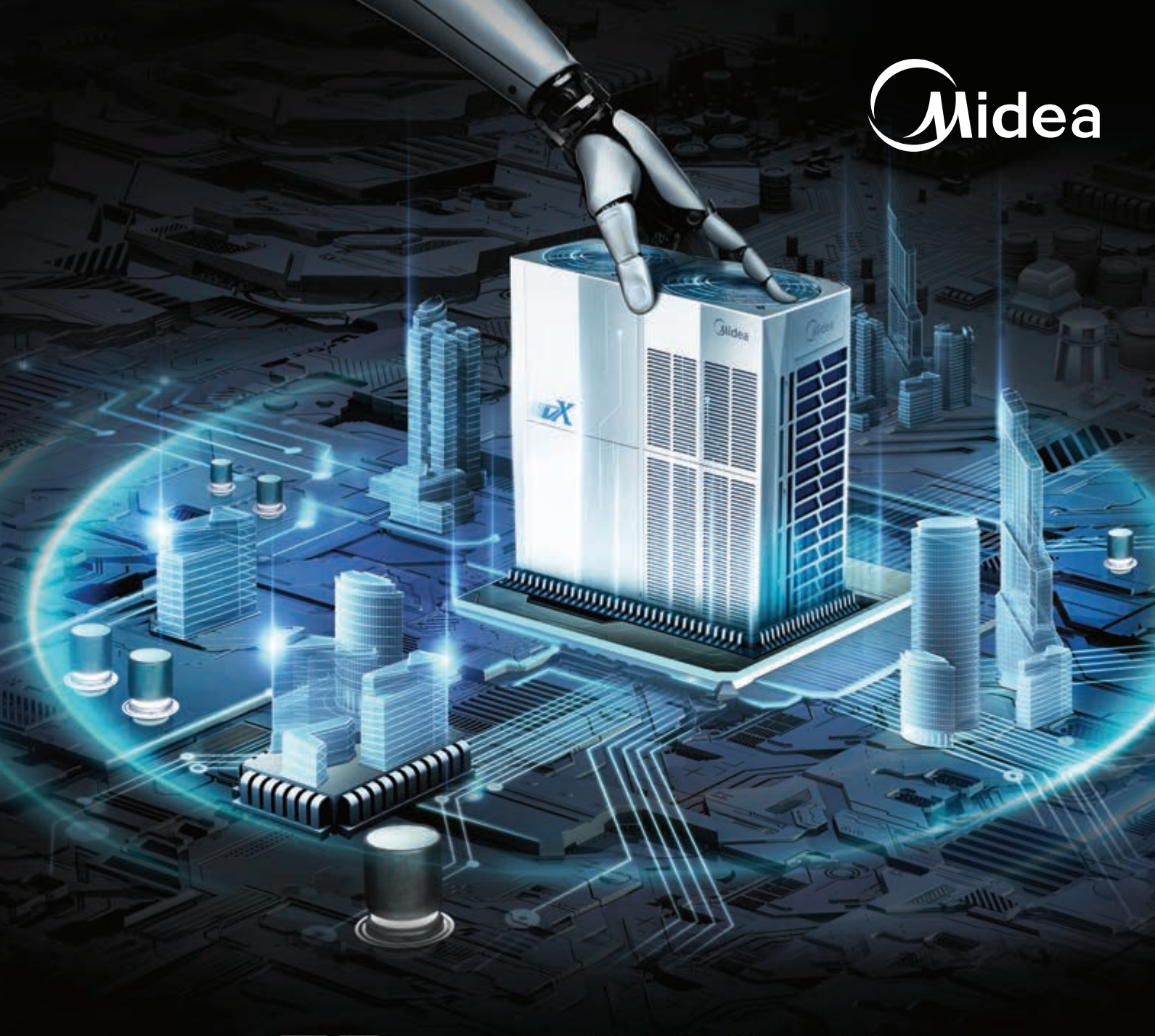
Upcoming Activities
SEPTEMBER - OCTOBER 2019

2-Day Course on "NFPA 13"

Date	:	23-24 September 2019 (Monday -Tuesday)
Time	:	9.00 a.m. to 5.30 p.m.
Venue	:	Wisma IEM
Approved CPD	:	Applying
Speaker	:	Ir. Gary Lim Eng Hwa

1-Day Workshop on "Conceptual Design of Structures"

Date	:	2 October 2019 (Wednesday)
Time	:	8.30 a.m. to 5.30 p.m.
Venue	:	Armada Hotel
Approved CPD	:	6.5
Speaker	:	Ir. Frankie Chong Kwet Hin



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FORUM

BE A MENTAL HEALTH AWARENESS ADVOCATE #MYMHEC2019

WOMEN ENGINEERS SECTION

reported by

Melaty Ghazali

It was an honour for Women Engineers Section to be invited to support Malaysia's 1st Mental Health Experiential Conference (#MYMHEC2019) on June 18-20, organised by the Ministry of Health in collaboration with Emerging Journey Asia, with a special focus on Mental Hazard @ Work.

Malaysia lags behind in tackling mental health issues due to a lack of resources especially in terms of facilities and practitioners. Currently, there is no insurance coverage for mental healthcare and treatment in Malaysia although coverage is provided in Singapore for five types of mental illness, including depression.

Neglecting mental health in the workplace is not only detrimental to the individual worker but it also directly affects productivity, efficiency and output of the organisation. Accidents at workplaces can be caused not only by poor work safety practices but also by mental health issues. More needs to be done to reduce societal stigma and to encourage people suffering from mental health challenges to seek help.

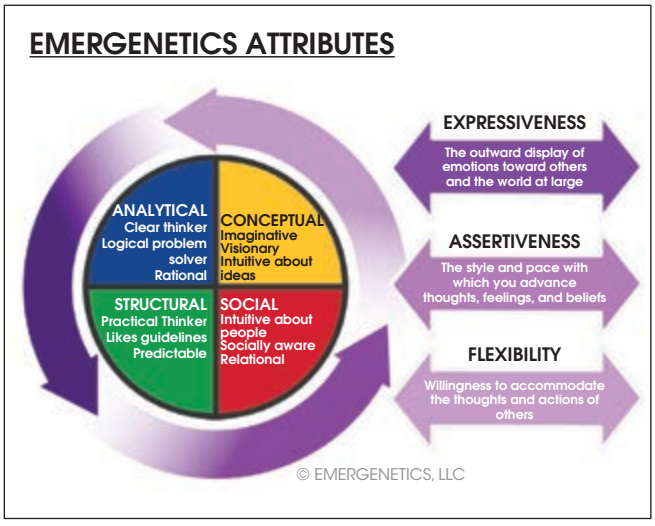
"We must, as a community, address mental health challenges and the stigma that haunts those who experience it daily," said Health Minister Datuk Seri Dr Dzulkefly Ahmad in his keynote address. In his special address, the chairman of National Institute of Occupational Safety and Health (NIOSH) said the neglect of mental health in the workplace is not only detrimental to the individual worker but also directly affects productivity, efficiency and output of any organisation. Accidents at workplaces can be caused not only by poor work safety practices but also by mental health issues. The normal psychiatrist to population ratio is one per 10, 000 but in Malaysia, the ratio is 1 to 100,000.

The conference started with a welcome speech by Dr Sangeeta Kaur, CEO of Emerging Journey Asia (EJA) and Puan Noraini, CEO of MySihat. Subsequently, after the talk by Dr Gurmit Dhillon on The Consequences of Neglecting Mental Health Issues, participants were requested to try the Online Mental Health Assessment.

Later that morning, in her Experiential Workshop, Dr Sangeeta Kaur talked about understanding a participant's thinking and behaviour preference in addressing the right approach on mental health wellness. She explained the four emergenetics group in detail, namely analytical, structural, conceptual and social. Emergenetics is the pattern of thinking and behaving that emerges from our genetic blueprint and life's experiences.

There are three attributes to these emergenetics groups: Expressiveness, assertiveness and flexibility. Expressiveness is the outward display of emotions toward others and the world at large. Assertiveness is the style and pace with which you advance thoughts, feelings and beliefs while flexibility is the willingness to accommodate the thoughts and actions of others.

The conference was then launched by Datuk Seri Dr Haji Dzulkefly Ahmad, who gave a keynote address on Government Policy & Initiatives in Handling Mental Health Issues in the Workforce. Day 1 concluded with a panel discussion on the topic, The Fear Factor: Are You a Walking Time Bomb? by 3 panellists – Capt. Nasaruddin A. Bakar from Malaysia Airlines Academy, Dr Saravanan S.R. Sundaramurthy from MICHMA and Dato' Azlin Ahmad Shaharbi, President of Peniagawati. The moderator was Ms. Hanie Razaif-Bohlendar, General Manager of Dragonfire Corporate Solutions Sdn. Bhd.



The morning of Day 2 started with a panel discussion on Stop The Stigma!, moderated by Ms. Vinnie Raviraj, Senior Director of HR & Talent Acquisition, SRG. The 3 panellists were Dato' Aishah Mohammad, CEO of Auxiliary Police from Maju Holdings Sdn. Bhd., Datin Seri Sunita Rajakumar, Director of Surprise Voice Sdn. Bhd. and Dr Hazli Zakaria, Deputy Psychiatry from UKM Medical Centre.

Next was a focus group session. This small group discussion on mental health topics was facilitated by a qualified mental health practitioner. Participants were required to choose a focus group they were interested in, such as anxiety, depression, stress, suicide or sleep disorder. They shared personal experiences on the chosen topic and had discussions on how to overcome the issues.

In the afternoon, Tan Sri Datuk Seri Lee Lam Thye, Chairman of NIOSH, gave a special address on Addressing Mental Health Issues at Workplace, followed by a talk by Dr Gurmit Dhillon from IAPT Talking Therapies, Redbridge, NELFT, National Health Services, United Kingdom on Outcome of Mental Health Assessment. Day 2 ended with a special address on Mental Hazard @ Work: Are You at Risk? by Dato' Mahfuz Omar, Deputy Minister of Human Resources and Chairman of National Council for Occupational Safety and Health.

On Day 3, two panellists discussed Youth & Mental Health in Changing World. They were Ms. Mimie Rahman, Director of MINDA (Malaysian Youth Mental Health Initiatives) and Ms. Lim Su Lin, a Policy Analyst from Penang Institute. The panel discussion was moderated by Dr Sudeep Mohandas, Managing Director of I First International.

In the afternoon, the Deputy Chairman of The Befrienders KL, Mr. Victor Tan, gave a talk on Suicide Prevention: Learning To Talk About Suicide. During the talk by Prof. Dr Amer Siddiq on What Leaders Needs to Know: Addressing the Mental Health Challenges Amongst Generation Gap, Syed Saddiq Syed Abdul Rahman, Minister of Youth and Sports, made a surprise entrance and joined the event for about half an hour, answering some questions from the audience. Later, the organisers distributed Mental Health First Aid Kits to the participants. Dr Sangeeta Kaur explained the functions of the kit in her talk on Mental Health First Aid Kit Intervention.

The conference had inspired all participants to become advocates for mental health awareness. The concept of mental health advocacy is to promote the human rights of persons with mental disorders and to reduce stigma and discrimination. It consists of various actions aimed at changing the major structural and attitudinal barriers to achieving positive mental health outcomes in populations.

Advocacy is an important means of raising awareness on mental health issues and ensuring that mental health is on the national agenda of governments. Advocacy can lead to improvements in policy, legislation and service development. Please refer to this website by World Health Organisation:

Women engineers with Datin Seri Sunita Rajakumar

https://www.who.int/mental_health/policy/services/1_advocacy_WEB_07.pdf

Among the participants at MYMHEC2019 were counsellors, psychologists, psychiatrists and NGOs as well as Women Engineers (WE) from IEM who shared their experiences. Ir. Mah Siew Kien said: "We can all help to build communities which understand, respect and prioritise mental wellness. The way we communicate and react makes a big difference in encouraging people to reach out for help. The respect, acceptance and support that we show them can make all the difference in helping them cope and recover. We need to start talking about counselling in a positive manner. Practising mindfulness is a great way to improve our headspace. Mindfulness is the ability to be fully present and be aware of where we are and what we're doing, without judgement, but with curiosity, kindness and care."

Dr Habibah Haron said: "It's a lot of new information and an eye opener for me. I gained new knowledge from the presentations, forums and focus group discussions which provided me with a better understanding of mental health related issues. I now know that mental health does not mean mental illness. Statistics show an alarming increase in mental health issues in Malaysia; it is real and worrying. These lead to realising the importance of advocating mental health (or mental wellness) to diminish the main problem of stigma. It is our responsibility to educate society (and ourselves) about mental health and to promote the concept of Reaching Out, Speaking Up & Listening Well.

Women Engineers, be proud to be pioneers of the Advocacy for Mental Health Awareness! We should not overlook mental health challenges which are tragic reminders of another side of life in our quest to become a developed nation. ■

#PEDULI #SpeakOutReachOut #StopTheStigma #LetsTalkMy

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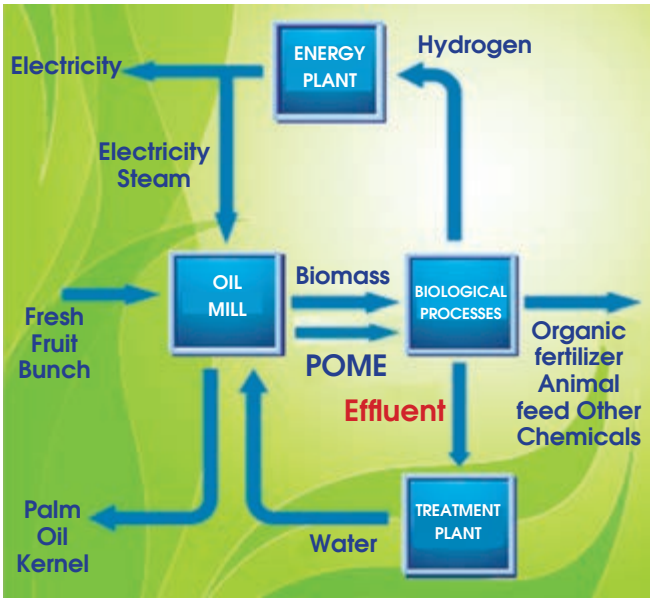
ZERO WASTE PALM OIL PROCESSING: AN INDUSTRY-UNIVERSITY INITIATIVE

WOMEN ENGINEERS SECTION

reported by

Dr Teow Yeit Haan



Integration of zero waste palm oil processing

Prof. Ir. Dr Mohd. Sobri Takriff, Director of IDEA Centre at Universiti Kebangsaan Malaysia and Co-chair Professor of Universiti Kebangsaan Malaysia-Sime Darby Foundation Chair on Sustainable Development, delivered a technical talk on a research programme on zero waste technology for the palm oil industry.

The palm oil industry is the key driver for rural development in the country and provides direct employment for half a million Malaysians and indirect employment for another 250,000 people. However, it faces numerous environmental challenges due to the waste generated during its production process. Every ton of fresh fruit bunch processed generates 0.5-0.7 tons of Palm Oil Mill Effluent (POME), 0.37 ton of solid wastes that is made up of Empty Fruit Bunch (EFB), 0.22 tons of EFB, 0.06 tons of kernel shell, and 0.09 tons of fibre.

POME, the single largest source of industrial wastewater pollution is conventionally treated in open ponds where it is subjected to a series of biological treatments. Nevertheless, this conventional treatment method results in the emission of greenhouse gases, namely methane and carbon dioxide. According to a Roundtable on Sustainable Palm Oil (RSPO) greenhouse gas working group report in 2009, 70% of greenhouse gases emitted from palm oil mills is contributed by POME. The fibres are used as boiler fuel, EFB is used for mulching at the plantation, while the kernel shell and kernel cake are sold as low value product.

Universiti Kebangsaan Malaysia, Sime Darby Foundation and Sime Darby Research Sdn. Bhd., have embarked on a collaborative initiative since 2010 to come up with a practical strategy for zero waste palm oil processing. The research programme, with a total funding of RM 21.6 million, is supported by Sime Darby Foundation and Sime Darby Research Sdn. Bhd. through an endowment, scholarships and research grant.

This industry-university research and development work focuses on pre-treatment of EFB for bio-hydrogen production, fermentative bio-hydrogen and bio-methane production from POME and pre-treated EFB, catalytic reforming of bio-methane, power generation from hydrogen gas, carbon dioxide sequestration and POME treatment using native microalgae species, membrane technology for water recycle and reuse as well as bioconversion of EFB agro waste into organic fertiliser with the aim of eliminating the waste to the air, ground and water body.

SUSTAINABLE APPROACH TO ZERO WASTE PALM OIL PROCESSING

This initiative is an excellent example of industry-academia collaboration to tackle sustainability issues for the palm oil industry. The jointly-developed strategy utilises the liquid effluent and solid by-products to generate renewable energy, produce bio-fertiliser, capture greenhouse gases and recycle the water as boiler feed. The developed zero waste technology is fully demonstrated in a pilot-scale facility installed at one of Sime Darby plantation's palm oil mills in Selangor. This integrated zero waste technology promises an alternative sustainable management practice in oil palm industry. ■

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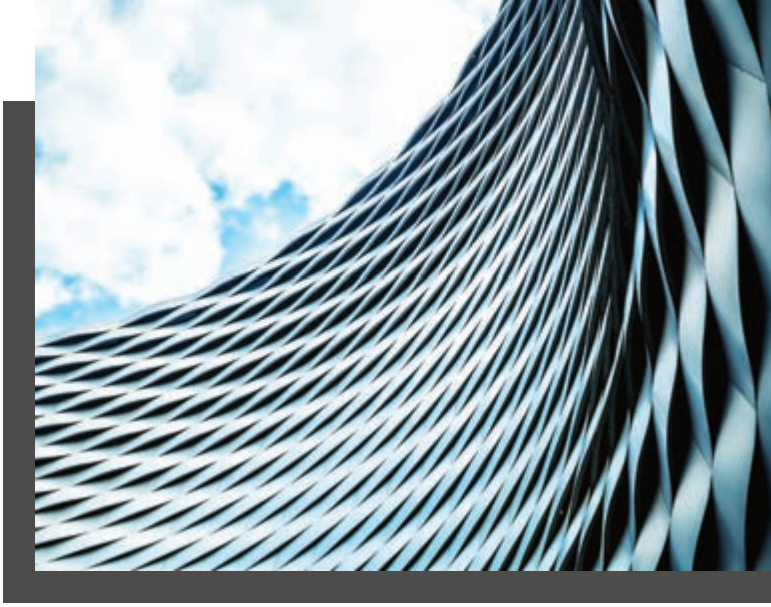

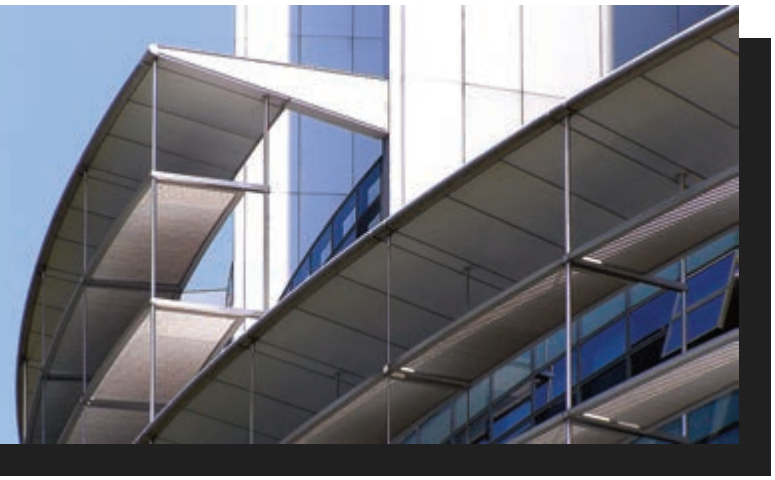

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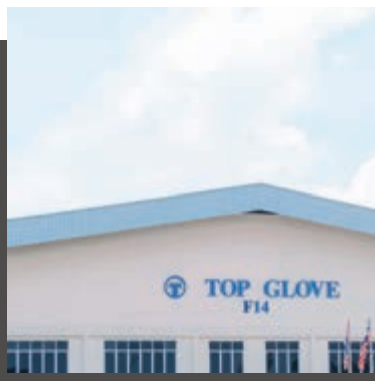

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MEMBERSHIP RENEWAL 2019 (FIRST REMINDER)

Dear IEM members,

Members who have not paid their annual subscriptions for year 2018/2019.

We would like to inform that the annual subscription may be paid using the following modes:

- Online via the MyIEM portal by M2u, RHB Now, Visa/Master Card (refer attached for instructions)
- Cheque made payable to The Institution of Engineers, Malaysia
- Cash payment at our IEM counter

For your information, membership subscription is essential for IEM to sustain activities organised for the benefit of members and therefore highly essential to us to continue with our existence. As reported at the last AGM, IEM organises approximately 300 to 350 events annually for the benefit of members to improve/advance their knowledge or to keep abreast with the latest developments. We try to keep our registration fee low so that it is affordable to all members.

I personally appeal to you to demonstrate your commitment by immediately logging into the portal and making the small payment which is outstanding at present.

Please assist us at the IEM Council in our endeavour to grow and sustain our membership and our beloved Institution.

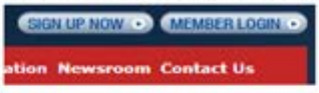
Thank you.

Ir. David Lai Kong Phooi
President
Session 2019/2020

Online Payment

MyIEM Portal Online Payment Step by Step

Step 1 – Click on member login button



Step 2 – Key in your username and password for your member login

Step 3 – Click on renew membership

Step 4 – The system will display the amount and click on proceed next button to proceed next step

Step 5 – Please click on confirm button to proceed payment method page

Step 6 – Please click on any payment options to continue and once the transaction successful, you will be redirect to the online receipt download page

IEM NEGERI SEMBILAN AWARDS & APPRECIATION NITE 2019

NEGERI SEMBILAN BRANCH

Ir. Dr Oh Seong Por

The Institution of Engineers, Malaysia, Negeri Sembilan Branch (IEMNS), held its biennial Awards & Appreciation Dinner 2019 on 29 June, 2019, at d'Tempat Country Club, Bandar Seri Sendayan, Seremban.

The guest of honour was the Negeri Sembilan Chief Minister, Y.A.B. Dato' Seri Hj. Aminuddin bin Harun, who was accompanied by his spouse, Datin Seri Wan Hasni binti Wan Yusof. Other distinguished guests were Mr. Cha Kee Chin, MP of Rasah, Mr. Teo Kok Seong, State Exco and Assemblyman of Bahau, Ir. Ong Ching Loon, Deputy President of IEM and Dato' Seri Ir. Dr Roslan bin Md Taha, immediate Past President of Board of Engineers Malaysia (BEM). Also present were Ir. Mah Siew Kien, Chairman of Women Engineer Section, IEM and Ms. Jenny Wang, Chairman of the Real Estate Housing Developers' Association (REDHA).

The 400 guests comprised IEM members, engineering consultants, contractors, partners, manufacturers, academicians and representatives of government agencies.

For the opening performance, the SMJK Chan Wa II choir (state school choir champion, 2018) sang the national anthem, Negaraku, followed by three Malay songs – Parajurit, Sinaran and Buah-buahan.

Award Recipients, From Left to Right: Ir Ong Ching Loon, Dato seri Ir. Dr Roslan bin Md Taha, Prof. Dr Zanuldin bin Ahmad, Edi Saufi bin Mohd. Darus, Y.A.B. Dato Seri Hj. Aminuddin bin Harun, Y.B. Tn Teo Kok Seong, Lim Swee Ee, Yeo Oon Tat, Ir. Dr Oh Seong Por, Dato Abdul Karim bin Mohd Tahir, Ir. Shahrin Amri bin Jahari

In his speech, IEMNS Chairman Ir. Dr Oh Seong Por thanked the Chief Minister and all the guests for their presence and contributions. He also welcomed the chairmen from other branches (Penang, Southern, Perak, Melaka and Kelantan) and paid tribute to the 7 attending past chairmen of IEMNS (1997 till 2016). Ir. Dr Oh said that since he was elected the 13th chairman in June 2018, the IEMNS committee had been busy organising technical visits, seminars and technical talks.

IEMNS had also collaborated with the IEM STEM (Science, Technology, Engineering & Mathematics) committee to promote STEM education among school children of SMJK Chan Wa I at Temiang and SMJK Chan Wa II at Galena on 17 May and 19 June respectively. The activities, carried out over a one-year period, benefitted about 600 participants.

The theme, Engineers as Prime Movers of Industry 4.0, reflected the important role of engineers in applying digital technologies to innovate their works to produce quantum leap performances. Ir. Dr Oh reminded engineers to maintain their mental agility to unlearn and relearn digital technologies such as artificial intelligence, cloud technology, big data processing and Internet of Thing (IoT). He ended his speech with a Malay pantun and the audience responded with a big applause.

Ir. Ong Ching Loon delivered a speech on the functions of IEM and volunteering activities to support members, to

Choir of SMJK Chan Wa II

Left to Right: Ir. Dr Oh Seong Por, Teo Meng Hui, Chin Bau Keong

Negeri Sembilan negeri beradat
Pemimpin mesra gigih menyumbang
Jurutera, usahawan beridea padat
Inilah rahsia negeri berkembang

promote the engineering profession and to contribute to nation development.

In his keynote speech, Dato Seri Hj. Aminuddin bin Harun congratulated the chairman and IEMNS for hosting such a meaningful event which attracted not only the engineering fraternity but also contactors, manufacturers, academicians and government officials. He elaborated on Malaysia Vision Valley 2.0 (MVV 2.0), a state-led, private sector driven development which spans 153,411 hectares of land to create an economic impact on the country and to provide job opportunities for the surrounding communities. It is also part of Rancangan Struktur Negeri, aimed at positioning Seremban and Port Dickson as part of Greater Kuala Lumpur. Various projects such as industrial zones, housing developments, modern transportation and commercial centres have been identified. He urged engineers and

Guests at the dinner event

business leaders to grab these opportunities and to participate in MVV 2.0 projects.

He thanked IEMNS for promoting STEM education in schools and hoped more students would take up science and mathematics studies to be future engineers and technical specialists who would further drive the nation's Industry 4.0 initiatives.

The highlight of the event was the awards presentation. For the first time, the IEM council had approved the conferment of Honorary Membership on Mr. Lim Swee Ee, President of Kibing Group (M) Sdn. Bhd. and Dato' Abdul Karim bin Mohd Tahir, Director of Public Works Department Negeri Sembilan. The awards were presented by Ir. Ong Ching Loon.

Ir. Dr Oh presented the IEMNS Industry Awards 2019 to Kibing Group (M) Sdn. Bhd., IJM Land Bhd and Kualiti Alam Sdn. Bhd. for their achievements in technical and social economy developments in Negeri Sembilan. He then made a donation to SMJK Chan Wa II for its school hall building fund. The cheque was received by its Assistant Principal, Ms. Teo Meng Hui, in the presence of Mr. Chin Bau Keong, Chairman of the Parent & Teacher Association.

Guests also won lucky draw prizes which included electrical appliances and hampers while a live band sang evergreen English and Malay songs. ■

IEMNS Past Chairman and Branch Chairman, From Left to Right: Ir. Ting Chek Choon, Ir. Abrizan bin Abdul Kadir, Ir. Simon Yeong Chin Chow, Ir. Hj. Baharuddin bin Ahmad Nasir, Ir. Mohd Nor bin Mohd Dros, Ir. Shahrin Amri bin Jahari, Ir. Dr Oh Seong Por, Ir. Ong Ching Loon, Y.A.B. Dato Seri Hj. Aminuddin bin Harun, Y.B. Tn Teo Kok Seong, Ir. Tiong Nga Pu, Dato Ir. Wong Chiang Choy, Ir. Hj. Jamil bin Ibrahim, Dato Seri Ir. Hj. Ahmad Husaini bin Hj. Sulaiman, Ir. Teo Ki Tuee, Ir. William Ho and Ir. Chan

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THE HIDDEN GEMS OF TURKEY

Ir. Sharifah Azlina Raja Kamal

Ir. Sharifah Azlina Raja Kamal Pasmah *has been practising Civil Engineering for almost 3 decades. She enjoys travelling with her family to places they read immensely about - places showcasing evolution of religions, wars and civilisation, medieval and modern structures as well as abodes of Dracula, vampires, fairies and Hobbits.*

We had chosen the less-travelled Black Sea and Aegean Sea regions for our vacation in Turkey this time. The Black Sea is home to beautiful coastlines and mountains. Descending into Trabzon's airport is a sight to behold, with the runway parallel to the deep-blue Black Sea on one side and Zigana mountains on the other.

Trabzon is steeped in history, standing along the famous Silk Road where religions and trades once flourished. Its lighthouse was an indispensable reference in navigating the perilous Black Sea waters. 77% of Trabzon is covered with mountains and the rest, plateaus. With abundant water supply, the fertile hilly coastline is ubiquitous with tea and hazelnut plantations. Hazelnut butter was the staple diet during our stay.

With cobblestone streets, ramparts, soaring minarets, hamam and Byzantine churches, Trabzon is a miniature Istanbul, sans the crowds. One attraction is Hagia Sophia, a 13th century church filled with New Testament frescos, ornamental entrances and centuries-old sailors' graffiti. After being closed for 52 years, it is now a museum.

The amazing Sumela Monastery, built into the rock face of Karadağ Mountains by Greek monks, was an Orthodox monastery dedicated to Virgin Mary. The high cavernous chamber of the rock church was industriously dug into the mountains. Founded in 386 AD, it went through numerous expansion and reconstruction until it reached its present-day grandeur in the 18th century. Outside the monastery is a spring, considered sacred by Greeks, and large stone arches form an aqua-duct for water supply.

100 kms south of Trabzon was Uzungöl, a lake town perched at 1,100m above sea level. Uzungöl means "long lake" in Turkish. The 1km-long lake is wedged between lush pine-forest mountains. The once-obscure town is now dotted with restaurants famous for fresh trout. A walk around this lake promises an overdose of oxygen and sceneries equal to the beauty of the Alps.

Rize province is a kaleidoscope of valleys, mountains, plateaus, glacial lakes, flowing streams, ancient bridges and castles. It is also world-famous for Anzer honey. Firtina River, one of the most important rivers meanders for 57 kms and is crossed by numerous historical, arched stone-bridges dating back to the 18th century. The rushing river is perfect for rafting and zip-lining.

Rising majestically above the Firtina Valley is a 14th century medieval Zilkale Castle. Once a garrison outpost, it offers an exquisite view of the entire valley from its lookout walls. The drive up its winding road skirts along the edge of the clouds, offering endless walking and hiking opportunities within the Kaçkar Mountains.

Hit the road for another 100 kms and we arrived at Ayder Plateau located at 4,000-feet elevation within spruce and beech forests. One can almost hear Julie Andrews singing Sound of Music in the rolling plateau. In summer, the sound of bagpipers herald the many festivities. It is renowned for its hot springs.

Enroute to Istanbul, 75 kms from Izmir, is Alaçati, a town on the coast of Aegean Sea. During the Ottoman period, Alaçati was a village of cavaliers and infantries. In the 19th century, the Greeks were invited to Alaçati to toil in various tasks including canal constructions, vineyards and olive farming while the local Turks went to war. Although the Greeks were forced to leave Alaçati from 1914, the rest were repatriated in a formal population exchange with Greece in 1923.

Alaçati was declared a historical site in 2005; the traditional bay-windowed stone houses with terracotta roofs and rambling bougainvillea adorning the walls are still beautifully preserved. Walking around Alaçati, we felt like we were on a picture-perfect Greek island. Motorised vehicles, save for scooters and Vespa were prohibited along the streets of the old town. We had to lug our luggage from the point of transport drop-off to the pension within the town. Alaçati, being in a peninsula, is inundated with pristine beaches famous for wind-surfing, swimming and snorkelling. Art galleries, souvenir stores and boutiques offer antiques and local handlooms whilst cafes line its streets offering Turkish-Greek fusion cuisine in relaxed Mediterranean ambience.

Ancient windmills, built to grind wheat, still stand on a hill overlooking the town. Along the highway towards Izmir airport are wind-energy power stations with modern windmills or wind-turbines. Turkey is lauded for its efforts in renewable energy and sustainable technology with the grid-connected wind farms.

Contented at the end of the journey, we zealously advocate these Turkish postcard-perfect regions, remarkable for both modern and ancient monuments as well as azure and pristine coastlines. ■

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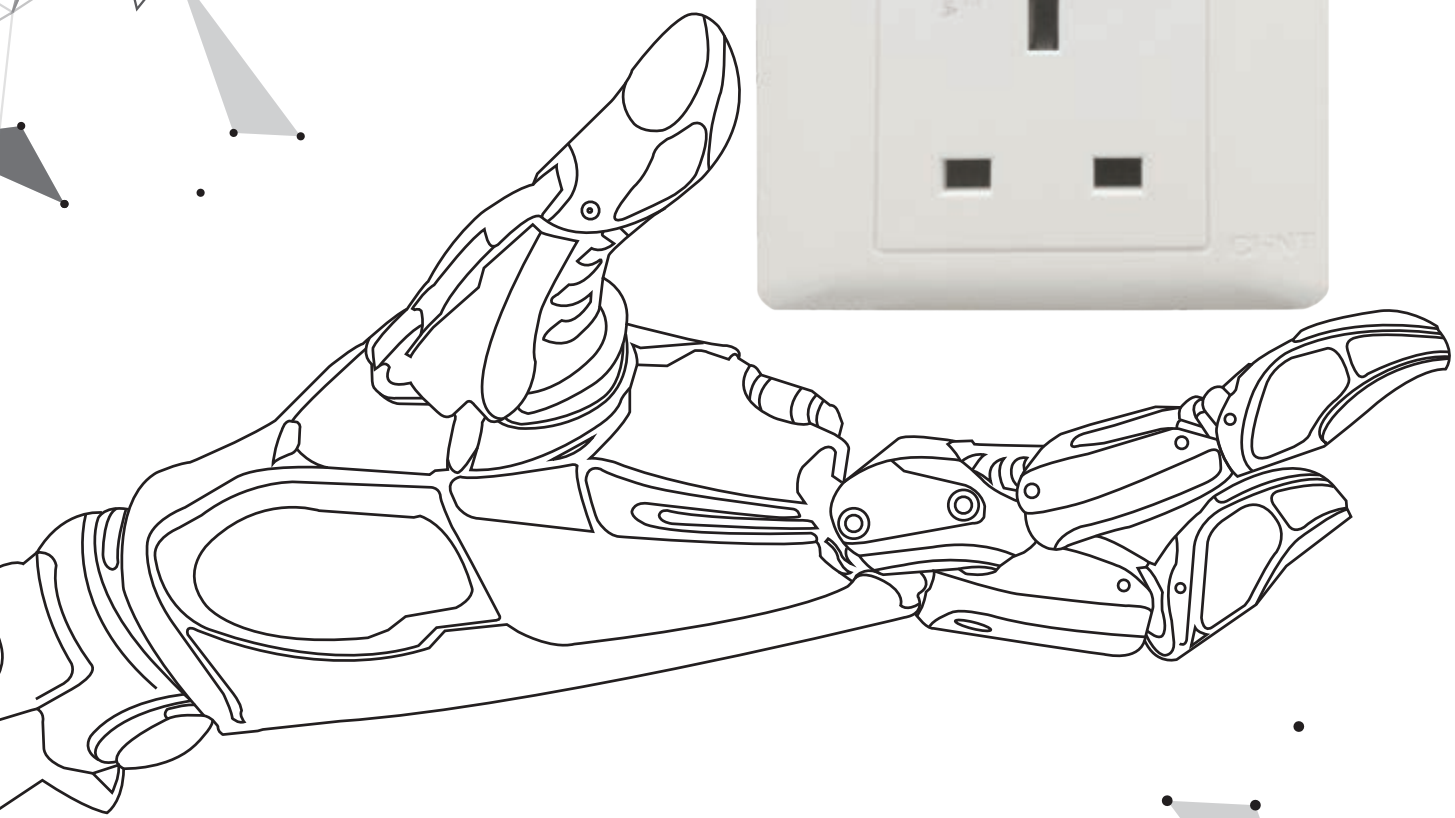

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TEMUDUGA PROFESSIONAL

Tarikh: 12 Julai 2019

Kepada Semua Ahli,

SENARAI CALON-CALON YANG LAYAK MENDUDUKI TEMUDUGA PROFESIONAL TAHUN 2019

Berikut adalah senarai calon yang layak untuk menduduki Temuduga Profesional bagi tahun 2019.

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 2019.

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)

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Pengumuman yang ke-130

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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 2019 adalah seperti jadual di bawah:

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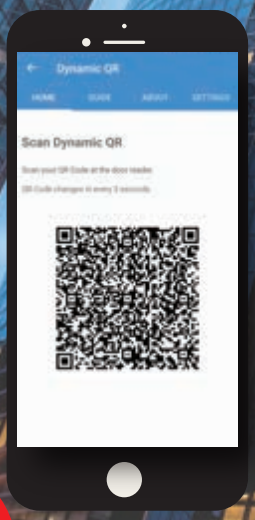

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