MBOT
LEMBAGA TEKNOLOGIS MALAYSIA
MALAYSIA BOARD OF TECHNOLOGISTS

Official Bulletin 15th Edition - KDN: PQ1780/J/187 2nd Quarter 2022

TECHIES

Artificial Intelligence (AI) for Small and Medium Scale Enterprises

Local Innovation Preserves Customary Teaching-Learning Setting

Increasing Premise Security and Safety: Smart Receptionist with Smart Lock System

ISSN 0128-1313
9 770128 131009

Contents

Techies 15th Edition

MBOT President's Foreword	03
Artificial Intelligence (AI) for Small and Medium Scale Enterprises	05
Transformasi Pemodenan Menjamin Kelestarian Industri Agromakanan Negara	06
Roadmap for the Malaysian Construction Industry	09
Local Innovation Preserves Customary Teaching-Learning Setting	11
Craft IoT Solutions: An Interview with Ts. Liew Choon Lian	14
Increasing Premise Security and Safety: Smart Receptionist with Smart Lock System	17
Technologists: Malaysia's Future Workforce	20
MBOT News: ENTICE 2021	22

ACKNOWLEDGEMENT AND APPRECIATION

Editorial Advisor
Prof. Ts. Dr. Mohamed Ibrahim Abdul Mutalib
FASc, FIChemE, P.Tech, C.Eng.
(Head of Publication Committee)

Publication Committees
Dato' Ts. Dr. Mohd Mansor Salleh
(Chief Editor)
Datin Ts. Dr. Zuraidah Mohd. Zain
(Editor)

Columnists
Ts. Laxamanan G. Kurappa
Ts. Dr. Krishnan Subramaniam
Tc. James Joseph
Ts. Dr. Muhammad Hazwan Hamzah
Ts. Ir. Wong Chee Fui
Mohamad Ezral Baharudin
Azuwir Mohd Nor
Mohd Sazli Saad
Mohd Zakimi Zakaria
Nur Syuhana Binti Zamjuri
Ts. Dr. Khairul Huda Binti Yusof
Ts. Dr. Ahmad Sukri Ahmad

Secretariat
Dr. Md Fauzi Md Ismail
Nur Salsabila Selamat
Mohamad Safwan Mustafar
Shahrul Hairazi Khudzari

Chief Editor's Note

Consumer Communication Technologies

In today's world, the expectations of businesses have changed tremendously, in tandem with rapid digital and technological revolutions that unfold continuously. Technology is poised to meet consumers' experience and communication requirements. The theme of this edition serves as a touchpoint that embraces all the transformations that we encounter on a daily basis in both our professional and personal lives.

TECHIES 15th Edition presents a diverse range of topics covering, among others, artificial intelligence for SMEs, and the 'light board approach' in online learning. Our intention is to highlight the many ways technology is adjusted, adapted, and/or adopted to serve individuals, organisations, and businesses better. This edition also showcases the use of industrial digitalisation in the agro food industry, and the issue of security and safety through the clever use of the 'smart receptionist'. Happy reading!

Thank you.

Dato' Ts. Dr.
Mohd Mansor Salleh

President's Note

Empowering the technological role of women

Datuk Ts. Ir. Dr. Siti Hamisah Binti Tapsir FASc
President of Malaysia Board of Technologists

DATA from the Ministry of Higher Education Malaysia two years ago showed that the majority of students at Institutes of Higher Education (IPT) across the country were women. The ratio was reported to be 25:75. Women obviously outnumbered men! However, when compared to the number of female professionals registered with the Malaysian Board of Technologists (MBOT), the figure is still low, and does not match the number of those who attended higher, or tertiary studies. Only 23 percent of enrolment is made up of women.

Hence, there is a need to empower women technologists and technicians so as to increase their position, visibility, and recognition. This has led to MBOT's efforts in introducing the Women Technologists Chapter. The Chapter is created to spur the registration of women as professional members and to encourage lifelong learning in order to improve women's standing in their careers.

We need to recognise the contributions and roles of every citizen in the field of technology. More so, women. This is the role of MBOT since its founding seven years ago. With empowerment, we hope to be able to help female professionals develop their careers while striking a proper work-life balance.

As we all know, the COVID-19 pandemic has impacted our lives, especially for working

women. This programme is one way to help them regroup, re-orient, and reaffirm their career journey.

The objectives of the Women Technologists Chapter include ensuring the sustainability of a quality talent pool for the country, supporting the advancement of women's careers in technological professions, supporting efforts to increase the representation of women in leadership positions, sharing knowledge, and learning best practices. The effort is in line with the goals and implementation actions outlined in the Twelfth Malaysia Plan (12MP) (2021-2025). Through 12MP, the government is targeting the involvement of women in the workforce at 59 percent. In 1990, this was at 46.8 percent, compared to 1957 (at 30.8 percent), with an average increase of 0.48 percent each year.

Data from the United Nations Educational, Scientific and Cultural Organisation (UNESCO) shows that more than 70 percent of researchers in STEM are men and less than 30 percent are women. Similarly, at the higher education level, only 30 percent of female students choose STEM fields.

The creation of the Chapter will bring numerous benefit to members registered with MBOT. Among others, it will help increase knowledge and awareness of the technologist and technician professions, and will provide a community support ecosystem to help improve career prospects.

We hope the Women Technologists Chapter will bring about awareness among women professionals on the importance of being registered as professional members. It is also to address the lack of mentors in providing career guidance, and to balance between career and family, especially in the post-pandemic phase. A key focus is to address the lack of women's involvement at managerial levels.

Chaired by Ts. Sharifah Zaida Nurlisha Syed Ibrahim from MMC Oil & Gas Engineering Sdn Bhd, the platform has two deputy chairpersons, namely, Ts. Annaliz Abu Bakar from PETRONAS Global Technical Solutions Sdn Bhd, and Ellis Yap Ling Po from Tata Consultancy Services. Committee members comprise Dr. Zurina Moktar, Ts. Dr. Mahaletchumy Arujanan, and Associate Prof. Ir. Ts. Dr. Tan Lai Wai.

The Chapter was launched by the Deputy Minister of Science, Technology and Innovation, Datuk Ahmad Amzad Hashim, on June 7, in conjunction with the MBOT Experts Network in Technology, Innovation and Cooperative Event (ENTICE) programme.

While the focus of the platform is to increase the number of female professional member registrations with MBOT, it also aims to increase knowledge in technology and industry. In order to achieve these objectives, among the main activities planned are 'Ladies in Cyber Webinar: An Online Sharing Session' – a webinar that will discuss women's issues in developing career paths in the fields of ICT and cyber security, and a 'Red Lips Hi-Tea Session' – an exclusive hybrid hi-tea event that will feature leading female professional figures who will discuss current issues faced by female professionals. Also planned is the Women in Technology & Technical Leadership Award – the first award of its kind to be introduced by MBOT and given in conjunction with the Technological and Technician Appreciation Council. The award aims to acknowledge and recognise the contribution of women in the technological profession, as well as technicians. It is hoped that these initiatives will change societal perspectives and that of employers, especially with regard to women's commitment and contribution in the development of a high-income nation.

Another event planned is the 'Women Technologists Roadshow 2023'. The roadshow is a technical visit to the industry to learn about best practices and to promote the 'Community of Practice' (COP). The learning programme will open opportunities for female professional members to improve their technical knowledge while expanding their network of relationships with stakeholders.

The establishment of the Women Technologists Chapter is a strategic initiative

> "The establishment of the Women Technologists Chapter is a strategic initiative that will be carried out by MBOT based on four main values, namely, sustainability, flexibility, inclusivity, and synergy. Since MBOT statistics show that women professional membership is relatively low, at around 20 percent, efforts will be intensified to double the figure."

that will be carried out by MBOT based on four main values, namely, sustainability, flexibility, inclusivity, and synergy. Since MBOT statistics show that women professional membership is relatively low, at around 20 percent, efforts will be intensified to double the figure.

We need to provide space and opportunities for women, and utilise their strengths and advantages in the development, progress, and wellbeing of our country.

The Ministry of Science, Technology, and Innovation (MOSTI) is supportive of MBOT's initiatives because they are in line with the government's desire to promote science, while humanising technology. As mentioned by Ahmad Amzad, MOSTI is aware of the contributions of many great Malaysian women in the field of science and technology, such as Tan Sri Dr. Jemilah Mahmood, Tan Sri Dr. Mazlan Othman, and Professor Dato' Dr. Asma Ismail, to name a few.

Malaysia has given birth to numerous great women who have made their mark in their respective fields. This initiative will give due recognition to those who are not only at the pinnacle of their office, but also to women in middle- and upper-management positions.

Datuk Ts. Ir. Dr. Siti Hamisah Tapsir is the President of the Malaysian Board of Technology (MBOT)

MBOT REGISTRATION (As of June 2022)

35,080 Graduate Technologists

7,077 Qualified Technicians

14,924 Professional Technologists

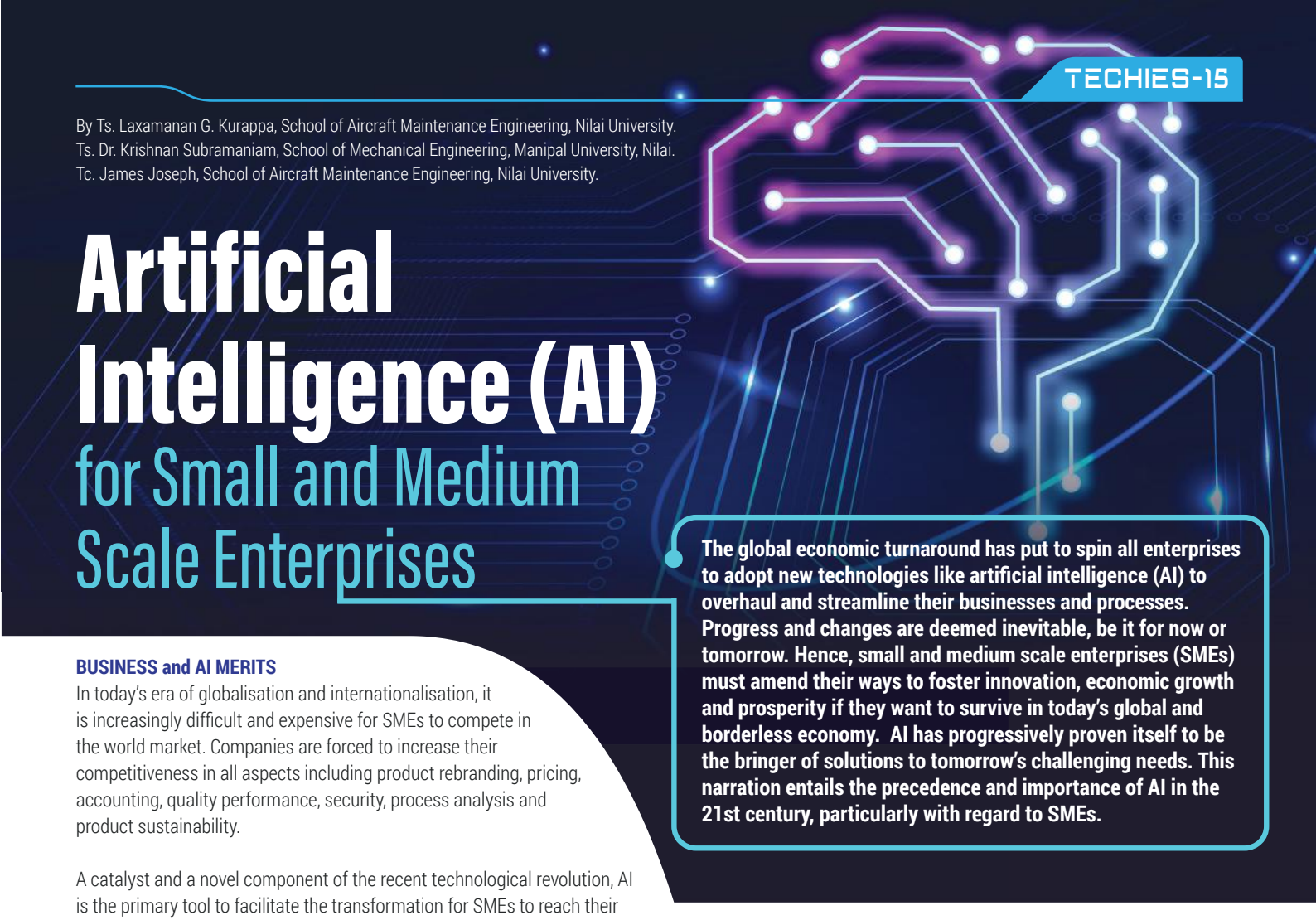
1,670 Certified Technicians

Total MBOT Registrants

58,751

By Ts. Laxamanan G. Kurappa, School of Aircraft Maintenance Engineering, Nilai University.
Ts. Dr. Krishnan Subramaniam, School of Mechanical Engineering, Manipal University, Nilai.
Tc. James Joseph, School of Aircraft Maintenance Engineering, Nilai University.

Artificial Intelligence (AI) for Small and Medium Scale Enterprises



The global economic turnaround has put to spin all enterprises to adopt new technologies like artificial intelligence (AI) to overhaul and streamline their businesses and processes. Progress and changes are deemed inevitable, be it for now or tomorrow. Hence, small and medium scale enterprises (SMEs) must amend their ways to foster innovation, economic growth and prosperity if they want to survive in today's global and borderless economy. AI has progressively proven itself to be the bringer of solutions to tomorrow's challenging needs. This narration entails the precedence and importance of AI in the 21st century, particularly with regard to SMEs.

BUSINESS and AI MERITS

In today's era of globalisation and internationalisation, it is increasingly difficult and expensive for SMEs to compete in the world market. Companies are forced to increase their competitiveness in all aspects including product rebranding, pricing, accounting, quality performance, security, process analysis and product sustainability.

A catalyst and a novel component of the recent technological revolution, AI is the primary tool to facilitate the transformation for SMEs to reach their highest potential. It provides a way to gain competitive benefit by being flexible, adaptive and interactive in the course of meeting the needs and interests of customers. SMEs that leverage AI as early as they can stand the chance to attain higher competitiveness, hence making them more productive.

Unfortunately, studies have shown that there are concerns relating to knowledge sharing and application of AI, particularly when comparison is made between developed and third world countries. In the third world, SMEs lack the edge to foresee the real potential of AI and its application. This is a major problem because AI is in fact *the* catalyst to industrialisation. Without AI, investors will not be interested to finance the industry in the particular country. Thus, a way to overcome this challenge must be looked into.

AI INCREASES SALES

Of the wide spectrum of AI applications available, marketing is among the most significant. There are a number of user-friendly AI apps that can be used very easily by almost everyone. AI-based marketing is focus-driven and very efficient. The apps are multi-tasking, multi-disciplinary automated instruments that allow for customer interaction and involvement. As such, business target margins can be achieved faster compared to old fashioned manual-oriented grinds that are slow and expensive.

To add, AI-powered analysis makes it easy to track feedbacks and manage communication links between all relevant parties in the buyer-seller loop. Chat-bots in websites enable sellers to give responses very quickly, hence resolving queries, complaints and problems with ease. This builds up a relationship of trust and dependency between the parties involved, turning the casual buyer into a loyal customer. It goes without saying that increased sales will follow suit.

AI SECURITY ASSURANCE

It has always been a concern that the security aspect of monetary transactions may be compromised during business dealings. Data shows that SMEs are more vulnerable to external cyber threats and security spams compared to bigger organisations. Fortunately, there are AI systems capable of tracking and detecting security discrepancies to protect against any type of intrusion. AI software enables companies and individuals to be shielded from cyber threats. This gives SMEs the assurance of having their manufacturing and sales to remain operating in order to satisfy their customers' daily needs.

It has to be stated that there is a large potential for AI to offer a range of security measures like face recognition, video & imaging analysis, behavioral analysis, crime flow pattern predictions, and many others. This will certainly be most welcomed in the community.

CONCLUSION

Throughout history, human beings have attempted to adapt her/his way of life to her/his environment so as to have a more conducive living condition. As technology progresses, our expectations and demands increase accordingly.

Today, technology has evolved beyond expectations in leaps and bounds. In a world where there are no longer physical borders and barriers, survival should not be taken for granted. AI is deemed to be *the* tool that can save companies from extinction. Products should be developed and favourably priced, with options of possible upgrades and cosmetic changes so that the demands of consumers can be met while the threat of competitors can be placed at bay. SMEs come under great pressure to compete in the arena of globalisation, liberalisation and decentralisation. It is obvious that the time has now come for SMEs to go all out in the use of AI, simply because it is a major way forward to meet the demands of the global population.

Ts. Dr. Muhammad Hazwan Hamzah,
Jabatan Kejuruteraan Biologi dan Pertanian, Fakulti Kejuruteraan, Universiti Putra Malaysia,
Pusat Penyelidikan Teknologi Perladangan Pintar, Universiti Putra Malaysia.

Transformasi Pemodenan Menjamin Kelestarian Industri Agromakanan Negara

Penduduk dunia dijangka meningkat kepada hampir 10 bilion menjelang 2050 sekaligus meningkatkan permintaan hasil pertanian dalam senario pertumbuhan ekonomi yang sederhana (Food and Agriculture Organization of the United Nations, 2017). Maka, rantaian bekalan makanan perlu diperkasa bagi memastikan peningkatan produktiviti, kualiti dan kecekapan terutamanya dalam situasi pasca-pandemik COVID-19 ini.

Dalam pada itu, kekurangan sumber asli dan perubahan iklim menyebabkan terancamnya keselamatan makanan global, dan fenomena perbandaran pula mempengaruhi corak pemakanan dan permintaan terhadap kepelbagaian makanan. Di samping itu, gejala kehilangan dan pembaziran makanan menyebabkan peralihan kepada sistem kelestarian makanan terencat.

Justeru, transformasi pemodenan sangat penting dalam menjamin kelestarian industri agromakanan Negara.

DASAR AGROMAKANAN NEGARA 2.0

Baru-baru ini, Kerajaan telah melancarkan Dasar Agromakanan Negara 2.0 (DAN 2.0) 2021-2030 yang membolehkan sektor agromakanan menjadi lebih berdaya saing melalui aplikasi teknologi pertanian tinggi. Ia diharapkan mampu menyumbang kepada pembangunan ekonomi Negara dan memastikan kelestarian alam sekitar seiring dengan Matlamat Pembangunan Mampan 2030 (SDG). DAN 2.0 mendukung pemodenan dan pertanian pintar sebagai salah satu teras dasar dalam pembangunan sektor agromakanan dalam tempoh 10 tahun akan datang.

Melalui teknologi pertanian pintar, pelbagai aspek industri akuakultur dan penanaman - seperti kawalan persekitaran, pemantauan isu serangga perosak, dsb - menjadi lebih terkawal dan cekap. Sesungguhnya, pemodenan dan pertanian pintar adalah sejajar dengan Rancangan Malaysia ke-12 bagi merancakkan pertumbuhan ekonomi dengan perkembangan Revolusi Perindustrian Keempat (4IR) (Bahagian Dasar dan Perancangan Strategik Kementerian Pertanian dan Industri Makanan, 2021).

4IR dalam bidang pertanian melibatkan transformasi rangkaian bersepadu dalaman (dalam ladang) dan luaran (di luar ladang, iaitu yang melibatkan pembekal, pelanggan, penyedia perkhidmatan, dsb) yang berkaitan dengan operasi pertanian tertentu (Mat Lazim et al., 2020). Petani dapat menggunakan teknologi pertanian tepat dalam kerja-kerja seperti mengenalpasti jumlah yang jitu untuk pengairan, pembajaan, racun perosak, sistem hasil dan sistem maklumat geografi pada waktu dan lokasi tertentu (Bejo, 2020). Ini akan meningkatkan keuntungan dan hasil produk pertanian. Petani juga boleh memantau keadaan ladang dan operasi pertanian tanpa pergi secara fizikal ke kawasan ladang.

Pendigitalan bagi industri berasaskan pengeluaran agromakanan didorong oleh pemacu teknologi seperti yang ditunjukkan dalam Rajah 1. Kini, pelbagai teknologi telah dibangun oleh pelbagai institusi dalam menyahut cabaran 4IR. Contohnya, penyelidik Universiti Putra Malaysia (UPM) membangunkan teknologi pengimejan udara sistem maklumat geografi dan pesawat tanpa pemandu untuk ladang durian melalui aktiviti pengumpulan, pengurusan, analisis spatial data, dan pemerolehan data (Syafiqah et al., 2019). Institut Penyelidikan dan Kemajuan Pertanian Malaysia (MARDI) dengan kerjasama Maxis mengaplikasi teknologi 5G bagi mengukur pelbagai butiran mengenai tanaman anggur seperti kelembapan tanah, nilai pH, jumlah cahaya dan suhu di Langkawi (Fahmy, 2021). Program Smart Sawah Berskala Besar yang dilaksanakan oleh jabatan dan agensi

Kementerian Pertanian dan Industri Makanan iaitu Jabatan Pertanian Malaysia (DOA), Lembaga Pertubuhan Peladang (LPP), Lembaga Kemajuan Pertanian Muda (MADA), Lembaga Kemajuan Pertanian Kemubu (KADA) dan Kawasan Pembangunan Pertanian Bersepadu (IADA) dapat meningkatkan hasil padi per hektar (Zulkafli, 2021). Aktiviti merangkumi pendekatan baharu diaplikasikan melalui konsep pertanian moden seperti penggunaan dron, sistem profil tanah dan internet benda.

Rajah 1. Teknologi pemboleh 4IR (Diubah suai dari Kementerian Perdagangan Antarabangsa dan Industri, 2018).

Usaha untuk mempergiat penyelidikan dan pembangunan, penerimagunaan teknologi dan automasi, ekosistem kondusif serta kepelbagaian program dan aktiviti inovasi merupakan strategi yang digariskan dalam DAN 2.0 (Bahagian Dasar dan Perancangan Strategik Kementerian Pertanian dan Industri Makanan, 2021). Sinergi kerjasama perlu dipertingkat dan dapat melonjak pendekatan berdasarkan model Quintuple helix (Rajah 2). Gabungan antara akademia, industri, komuniti, dan kerajaan dijangka dapat memberi solusi kepada isu-isu nasional dan antarabangsa sektor agromakanan. Perbincangan meja bulat, usaha sama pembangunan teknologi, pembentangan kertas penyelidikan dan pemindahan teknologi dan latihan kepada komuniti perlu diteruskan bagi memastikan teknologi yang dibangunkan dapat digunakan golongan sasaran secara efektif.

Kerancakan penggunaan teknologi 4IR terkini dalam menyelesaikan masalah reka bentuk dan pembangunan termaju memerlukan sumber manusia terlatih dalam ilmu dan kemahiran dalam kalangan jurutera dan teknologis pertanian. Bidang teknologi yang mungkin akan diterima pakai menjelang 2025 berdasarkan Tinjauan Masa Depan Pekerjaan 2020, Forum Ekonomi Dunia perlu diberi perhatian bagi mereka- bentuk kurikulum yang dapat mempersiap modal insan berdaya saing dalam sektor agromakanan (Jadual 1).

Jadual 1. Bidang teknologi yang mungkin akan diterima pakai menjelang 2025 dalam pertanian, mengikut bahagian syarikat yang dikaji, sektor terpilih (Diubah suai dari World Economic Forum, 2020).

TEKNOLOGI/SEKTOR	PERATUS (%)
Percetakan 3D dan 4D serta pemodelan	54
Kecerdasan buatan	62
Realiti terimbuh dan maya	17
Analisis data raya	86
Bioteknologi	50
Pengkomputeran awan	75
Teknologi lejar teragih	31
E-dagang dan perdagangan digital	80
Penyulitan dan keselamatan siber	47
Internet benda dan peranti yang disambungkan	88
Bahan baharu	15
Penyimpanan dan penjanaan kuasa	75
Pengkomputeran kuantum	18
Robot, humanoid	42
Robot, bukan humanoid	54
Pemprosesan teks, imej dan suara	50

Pemerkasaan dan pembangunan modal insan perlu diteliti rapi bagi memastikan graduan yang adaptif dan kalis masa hadapan dapat dihasilkan, bersesuaian dengan industri dan situasi masa kini. Pelbagai program pengajian berkaitan teknologi dan kejuruteraan kini ditawarkan oleh institut pengajian tinggi tempatan, termasuk Bacelor Kejuruteraan Pertanian & Biosistem dengan Kepujian (UPM), Bacelor Teknologi Pertanian Pintar dengan Kepujian (UPM), Bacelor Kejuruteraan Biosistem dengan Kepujian (UniMAP) dan Bacelor Teknologi Pintar Pengeluaran Tanaman (UiTM). Semestinya, DAN 2.0 dan pelan tindakan yang telah dirangka memerlukan penglibatan semua pihak terutamanya dalam bidang penyelidikan, pembangunan, pengkomersilan dan inovasi. Konsep Keluarga Malaysia yang dicetuskan YAB Perdana Menteri perlu diterapkan pada segenap lapisan masyarakat untuk memacu pembangunan, modenisasi dan kelestarian sektor agromakanan Negara.

Berat sama dipikul, ringan sama dijinjing. Bulat air kerana pembentung, bulat manusia kerana muafakat.

Rujukan:

Bahagian Dasar dan Perancangan Strategik Kementerian Pertanian dan Industri Makanan (2021). Ringkasan Eksekutif Dasar Agromakanan Negara 2.0 2021-2030. Putrajaya.

Bejo, S. K. (2020, October-December). Preparing Agricultural and Biosystems Engineers for Agriculture 4.0. The Ingenieur Vol 84, 36–39.

Carayannis, E. G., & Campbell, D. F. (2014). Developed democracies versus emerging autocracies: arts, democracy, and innovation in Quadruple Helix innovation systems. Journal of Innovation and Entrepreneurship, 3(1), 1–23.

Fahmy, A. R. (2021, 23 Februari). Pertanian pintar guna teknologi IoT. Berita Harian.

Food and Agriculture Organization of the United Nations. (2017). The future of food and agriculture: trends and challenges (1-180).

Kementerian Perdagangan Antarabangsa dan Industri. (2018). Industry 4WRD. In National Policy on Industry 4.0. Kuala Lumpur: Kementerian Perdagangan Antarabangsa dan Industri.

Mat Lazim, R., Mat Nawi, N., Masroon, M. H., Abdullah, N., & Che Mohammad Iskandar, M. (2020). Adoption of IR4.0 into Agricultural Sector in Malaysia: Potential and Challenges. Advances in Agricultural and Food Research Journal, 1(2), 1–14.

Syafiqah, N. F., Shariff, A. R. M., & Ya, N. N. C. (2019). GIS and UAV Aerial Imaging Applications for Durian Plantation Management. The 40th Asian Conference on Remote Sensing, 1–8.

World Economic Forum (2020). The Future of Jobs Report 2020.

Zulkafli, N. (2021, 9 November). 3,811 pesawah terima manfaat program Smart SBB. Sinar Harian.

PETRONAS

A progressive energy and solutions partner enriching lives for a sustainable future

About Us

We are a dynamic global energy group with presence in over 50 countries. We produce and deliver energy and solutions that power society's progress in a responsible and sustainable manner.

We seek energy potential across the globe, optimising value through our integrated business model. Our portfolio includes cleaner conventional and renewable resources and a ready range of advanced products and adaptive solutions.

Sustainability is at the core of what we do as we harness the good in energy to elevate and enrich lives. People are our strength and partners for growth, driving our passion for innovation to progress towards the future of energy sustainability.

Our Services

The integration of Engineering, Procurement, Projects and Technology portfolios that PETRONAS provides allows clients to have better oversight and control over the end-to-end value chain of these functions. Consequently, this paves the way for us to create better synergy and collaboration across the value chain.

Project Management	Technical Services & Solutions	Technology Deployment	Education & Training
Project Management Delivery	Specialised Engineering Solutions	SmartCEN™	INSTEP® INSTITUT TEKNOLOGI PETROLEUM PETRONAS
Construction, Hook-up & Commissioning	Technical Services & Expertise	ProAssure™ Wrap	
Project Governance, Risk & Performance	Front End & Cost Engineering	SolidClenz™	UTP UNIVERSITI TEKNOLOGI PETRONAS
		Vibration Clamp™	
		iCWD™	
		ProAssure™ Clamp	

For more information, kindly scan the QR code.
You can also contact us at pgtssbenquiry@petronas.com.my.

By Ts. Ir. Wong Chee Fui
P. Tech, PEPC. FIEM, MTAM, IntPE, ACPE,
APEC Engineer, ASEAN Engineer

ROADMAP FOR THE MALAYSIAN CONSTRUCTION INDUSTRY

The Forth Industrial Revolution (4IR), which predominantly comprises Autonomous Robotics, Big Data, Cloud Computing, Internet of Things, Additive Manufacturing (3D printing), System Integration, Cyber Security, Augmented Reality, and Artificial Intelligence, has been much talked about both locally and globally. In line with it, the Malaysian government has launched the National Policy on Industry 4.0 (Industry4WRD) to ensure that a concerted and comprehensive transformation agenda is in place for the manufacturing sector and its related segments.

The construction industry is starting to see the impact of Industry 4.0 as it begins to use innovative new technologies while updating and upgrading current ones.

Some major technological advancements in use in the construction industry are:

Building Information Modelling (BIM)
BIM is a modelling technology that takes into account the processes of producing, communicating, analysing and utilising digital information models throughout a construction project's life-cycle. It is an intelligent three-dimension (3D) model-based system that gives architecture, engineering, and construction professionals useful insight to plan, design, construct and manage buildings and infrastructures more efficiently.

The use of BIM improves the efficiency of the planning and design stages of the project. Three-D visualisation provides all the elaborate details looked for, while BIM-extracted information regarding the quantity needed for building materials improves the adeptness of the activity. The use of a cloud-based platform makes analysis, design audit, and design production better whereby the client and the building owner have access to the proposed design and modifications, and hence, evaluation can be performed by both parties.

Drone Technology
Drones provide numerous advantages when used in project and site monitoring processes. Used during construction site surveys, they expedite the exercise tremendously. Tedious ground survey, site mapping, and ground contouring can now be completed via drones that give impressive overview image detailing.

Industrialised Building System (IBS)
Industrialised Building System (IBS) is a technique of construction for which components are manufactured in a controlled environment, either on site or off site. The components are then placed and assembled into construction works.

IBS enables the production of high-quality products and minimum waste. This is because the manufacturing of the components is done in easier-to-control factory environments. To add, completion rate is increased due to the use of prefabricated components that replaces onsite fabrication. Overall, IBS results in a safer, cleaner and more organised site. This in turn leads to the reduction of dependency on foreign workers to complete the construction project.

> "Industrialised Building System (IBS) is a technique of construction for which components are manufactured in a controlled environment, either on site or off site. The components are then placed and assembled into construction works."

The construction of the HuoShenShan Hospital in Wuhan, China, which was completed in 10 days, is an excellent example of the advantage of IBS technology.

Green Building Construction
Green buildings have inherently low carbon footprint. Therefore, they have lower adverse environmental impact and boast better indoor environment. Hence, the social well-being of the occupants is invariably improved too. In other words, a green building has higher standards and will perform better over its life cycle.

The Green Building Index (GBI) and the GreenRE are two of Malaysia's industry- recognised green rating mechanisms that promote sustainability of the built environment.

Major Challenges of the Construction Industry Moving Towards Industry 4.0

Lack of understanding of Industry 4.0

In general, the construction industry lacks understanding of the concept of Industry 4.0 particularly what is termed as 'Construction 4.0'. There is misperception that the adoption of new construction technologies will have cost implications. While this is somewhat true, one should look at the longer term, whereby, the increase in efficiency, productivity, and time savings, as well as the reduction in the human-power needed will compensate the initial costs involved.

No Comprehensive Policy and Coordination of Industry 4.0 in Malaysia

The National Policy on Industry 4.0 (Industry4WRD) focuses only on the manufacturing sector.

There is an urgent need for the government to formulate a clear construction industry roadmap and national policy to provide a well-defined plan for pertinent industry players to streamline future programmes related to IR 4.0. The plan should include the participation of stakeholders such as the Malaysia Board of Technology (MBOT), the Board of Engineers Malaysia (BEM), the Construction Industry Development Board (CIDB), as well as institutions such as the Technological Association Malaysia (TAM), the Institution of Engineers Malaysia (IEM), the Malaysia Institute of Architects (PAM) and the Malaysia Building Association Malaysia (MBAM).

Lack of Targeted Incentives

The government should facilitate the transition and migration to Construction 4.0 by providing comprehensive programmes to help construction industry players assess their capabilities and readiness to adopt new technologies and processes. There should also be funding and other forms of incentives to strengthen the initiative.

Mismatched skill sets and lack of right talent/human capital;

There is currently a mismatch of skill sets between what is available and what is needed to embark on Construction 4.0. This is where professional bodies should play a role to facilitate and/or to provide appropriate programmes to enhance the knowledge of the construction workforce towards the adoption of Construction 4.0. Programmes comprising training courses, seminars and conferences on BIM Manager Training & Certification, IBS, and Green Building Rating, among others, can be conducted.

Construction industry players must thoroughly consider the evolving needs of the industry in end-to-end project management. The only way to achieve this is to embrace technology and productivity-enhancing innovations to improve decision-making and work procedures.

The risk of not adopting Construction 4.0 is the looming prospect of facing the infamous Kodak/Nokia moment, whereby industry players suddenly find that their processes are no longer needed and that their competitors have redefined their products and their industry, rendering them obsolete and irrelevant.

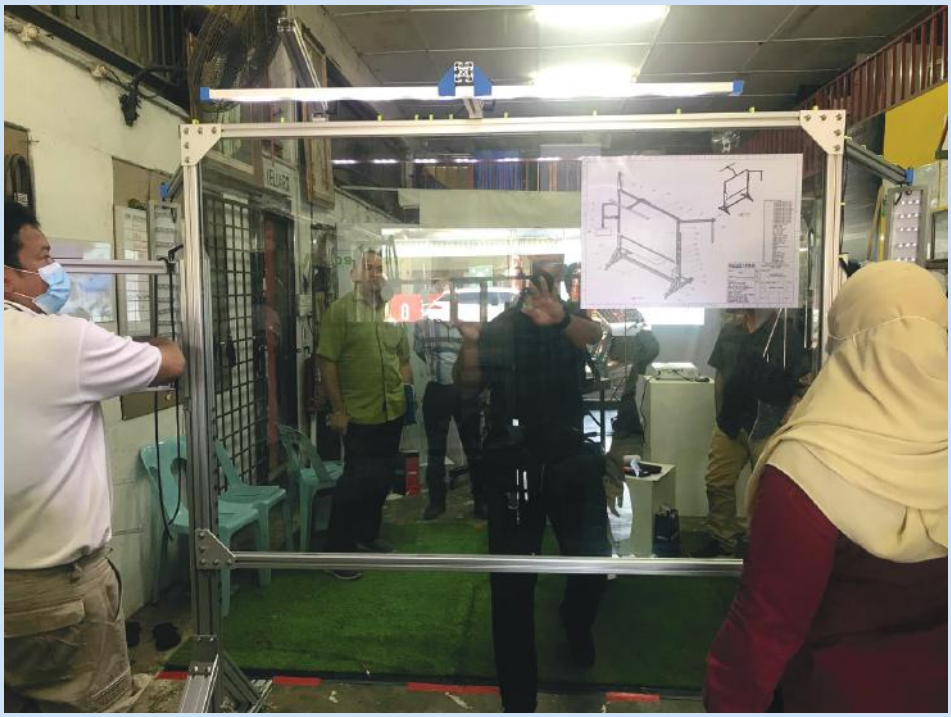
By Mohamad Ezral Baharudin, Azuwir Mohd Nor, Mohd Sazli Saad & Mohd Zakimi Zakaria, Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis

Local Innovation Preserves Customary Teaching-Learning Setting

When Thomas Edison invented the electric lamp, he was not the first to do it. There were many others who were working on it and some even managed to develop some forms of electricity-based lightings. But up to that time, nothing had been developed that was remotely practical for home use. When Edison's invention was publicly demonstrated and most of the critical design components were openly discussed, more people started to improve and innovate on the original design. From this story, we can conclude that an invention occurs when a completely new idea is turned into a creation, while an innovation is the improvement of an existing idea.

The Covid-19 pandemic has certainly hit the globe very hard, and in many parts of the world, it does not seem to show any signs of slowing down. As is the case in all areas of life, the education sector has to be reimagined. Physical face-to-face classes are, for the most part, gone for good, making way for a new knowledge-acquisition process commonly referred to as "online learning".

"Online learning" is a new norm that attracts numerous improvement efforts to ensure that students' learning would continue



"The Covid-19 pandemic has certainly hit the globe very hard, and in many parts of the world, it does not seem to show any signs of slowing down. As is the case in all areas of life, the education sector has to be reimagined. Physical face-to-face classes are, for the most part, gone for good, making way for a new knowledge-acquisition process commonly referred to as "online learning".

classroom setting. For STEM subjects and core engineering topics, much in-depth explanation is needed when it comes to equations and complicated diagrams. Face-to-face conventional teaching methods can fulfil this need, but in an online classroom, a novel teaching style is necessary. This is where the 'light board approach' comes in handy.

The light board was invented by Prof. Michael Peshkin at Northwestern University in 2012. It is essentially a sheet of high-quality glass, edge-lit with LEDs and set on a robust frame. When a fluorescent marker is used to write on the glass, the ink glows and becomes clearly visible. Video is recorded by a camera on the other side of the glass, which reverses the frames to make the text legible. To avoid reflections on the camera side of the glass, the light board is partially encased in a blackout studio. As a consequence, from the teacher's/presenter's perspective, she is writing on a chalkboard-like surface while facing a camera. The teacher/presenter establishes eye contact while writing in mid-air, at least from the student's/audience's point of view.

> "The system can stream both video and audio onto any video conference platforms such as Google Meet, Zoom, Webex, Microsoft Teams or Skype."

Based on this basic invention, a group of local researchers started to improve the system by redesigning the frame to meet the needs of today's teaching styles. This is where the innovation of the DyCoS Lightboard started. The DyCoS Lightboard Studio is designed to make it possible for lecturers to face their students and write texts on a glass in a way that comes quite close to the atmosphere in a real classroom.

The DyCoS Lightboard is a simple solution for streaming or recording instructional videos, where the focus is on writing or drawing. The lecturer writes on the glass surface with a fluorescent marker while the presentation is recorded, ensuring both text and presenter to remain visible throughout the learning session. A PowerPoint image can be merged to appear in the video as if it has been projected onto the writing surface.

The Lightboard Studio comprises five main components comprising camera, light board unit, lighting system, audio system and computer. The setup is either high- or low-end, depending on the desired delivery output quality and budget. For the system to work well, some studios might require special microphones and lighting. The result is a quick and easy way to stream and record videos that include real-time handwriting component. The system can stream both video and audio onto any video conference platforms such as Google Meet, Zoom, Webex, Microsoft Teams or Skype.

The advantage of the DyCoS Lightboard over other lightboard brands is that, it is designed to meet strict industrial design specifications while remaining affordable to individual and institutional users. The cost is kept low, without compromising the quality of the product.

The Lightboard has been in use on an experimental basis for almost two years since it was first introduced in August 2020. It is designed in accordance to the Technology Readiness Level (TRL) scheme, which is a process that facilitates researchers and new product developers to identify and apply for funding at various research stages. The stages comprise early-stage research (TRL 1-3), development stage (TRL 4-6), and commercialisation (TRL 7-9). The Lightboard design has now evolved from first generation

> "The Lightboard design has now evolved from first generation to the third, making its present state an all-in-one construction that is more compact, user friendly, and cost effective."

to the third, making its present state an all-in-one construction that is more compact, user friendly, and cost effective.

After being in use for a while, there is demand to redesign the Lightboard so that it becomes smaller, hence requiring less space and making it easier to carry. After going through a series of design and prototype development, the Tabletop Lightboard model is finally crafted. Not only is it cheaper, it can now be easily installed in a tiny workspace without the need for a studio.

Currently, several Lightboard variations have been developed in partnership between Universiti Malaysia Perlis and two private companies. More than 20 units of the product have been produced, with research and development costs funded using government and non-public grants. A number of educational institutions (secondary schools, universities), non-government organisations, and individuals are already using this innovative device.

With feedbacks along the lines of "the atmosphere the Lightboard brings is similar to being in a real class", and "we can follow our lessons with ease and hence our understanding of the subject is much better even though the class is a virtual one", there seems to be a huge potential of this tool in the future.

In a world where the traditional classroom setting is almost at the brink of extinction, the Lightboard – among other innovative developments - gives a ray of hope that the fairly customary teaching-learning process can somewhat be 'preserved'. This, no doubt, comes as good news to many.

References

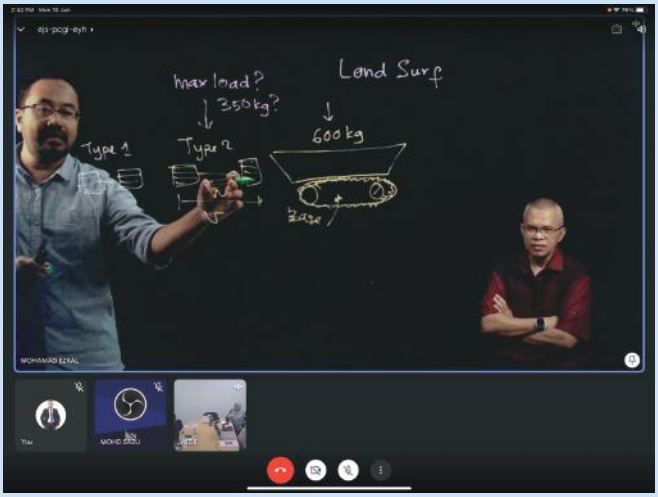
1. Birdwell, J. A., & Peshkin, M. (2015, June). Capturing technical lectures on lightboard. In 2015 ASEE Annual Conference & Exposition (pp. 26-325).

2. Fung, F. M. (2017). Adopting lightboard for a chemistry flipped classroom to improve technology-enhanced videos for better learner engagement. Journal of Chemical Education, (pp. 256-259).

3. Lubrick, M., Zhou, G., & Zhang, J. (2019). Is the future bright? The potential of lightboard videos for student achievement and engagement in learning. EURASIA Journal of Mathematics, Science and Technology Education, 15(8).

4. McCorkle, S., & Whitener, P. (2020). The Lightboard: Expectations and Experiences. International Journal of Designs for Learning, 11(1), 75-83.

5. Swenson, M. J., Spence, T., & Smentkowski, B. (2021). Student-led development of a lightboard to enhance future student learning. International Journal of Mechanical Engineering Education, 50(2):253-268.



Craft IoT Solutions

An Interview with

Ts. Liew Choon Lian

Group Chairman and CEO of MDT Innovations

Ts. Liew Choon Lian is the Group Chairman and CEO of MDT Innovations. Liew guided MDT Innovations to a place in history when it emerged 12th in the Fast 500 Asia Pacific 2011, the highest ranking ever achieved by an Asean company. Between 2006 and 2013, the company won 13 Asia Pacific ICT awards, including two Prime Minister's Best of the Best awards. It has also won the Red Herring Top 100 Asia Company 2008 and the Red Herring Top 100 Global Company 2009 awards. These awards testify to the company's strengths in technology and innovation.

In the early 1990s, Liew was among the top market analysts of a hot technology called "multimedia", with Nick Arnett of Multimedia Corporation. Liew was also among the key players involved in pen-based and mobile computing, working with Jeff Hawkins, Donna Dubinsky (Palm Computing) and Maeda (Sharp Corporation), which resulted in the successful Palm Pilot and Zaurus.

At Fuji-Keizai USA, Liew became a very successful industry analyst; then a strategic consultant in New York, San Jose and Tokyo, serving world-class corporations such as NTT, Panasonic and NEC. Liew was eventually hired by Matsushita (Panasonic) Corporation as General Manager of Worldwide Operation based in Fujisawa before becoming an entrepreneur.

Liew was among the 13 members of the Local Advisory Panel to the Ministry of Science and Technology and MDeC, providing input on enhancing Malaysia's ICT competitiveness. Abroad, Liew plays a vital role in major ICT events as a speaker, judge or panel member.

Interviewers: **Can you share your typical day as Group CEO of the esteemed organisation you are leading?**

Ts. Liew Choon Lian: My routine is simple as I am efficient with my time. I consider 9-to-5 a myth, and I do not like to waste time, so I immediately dive into research when a new opportunity comes along. I kickstart the day by going over my agenda, then I proceed to urgent matters through face-to-face meetings, calls or video conferences. Then, I grab a quick bite before getting updates from my executives on projects which are in progress. The rest of my day is spent exploring new opportunities as well as new technologies, and having brainstorming/ planning sessions.

Interviewers: **Your academic and industry achievements are very impressive. Of all, which have been most challenging, and how did you overcome them?**

Ts. Liew Choon Lian: I believe there is no progress without challenges as nothing comes easy. Each achievement was challenging in its own ways. When facing a challenge, I stay calm, persevere, think realistically, and use logical reasoning to identify solutions which can help me overcome it.

Interviewers: **Of your many accomplishments, which ones are you most proud of? Why?**

Ts. Liew Choon Lian: I am most proud of MDT Innovations. Since I formed it in 2004, it has transformed from a company focusing on multimedia display technologies into a company focusing on the Internet of Things. MDTi is not just innovative. It has persisted through a multitude of adversities over the years. It has adapted and grown by leaps and bounds. I could not be prouder of its achievements.

Interviewers: **In line with the name 'MDT Innovations Sdn Bhd', what do you think should be done to instill the spirit of innovation among Malaysians?**

Ts. Liew Choon Lian: I think many schools are already on the right track by highlighting STEM subjects for youths, in-line with the growing significance of innovative thinking in our world today, but schools should also prioritise the honing of leadership skills. Initiatives such as competitions, workshops or conventions with heavy emphasis on the assessment of creative thinking and innovative capabilities will also be good to instill the spirit of innovation amongst Malaysians.

Interviewers: **What is your advice to young entrepreneurs, technologists and technicians to prepare themselves for the challenges ahead?**

Ts. Liew Choon Lian: Perseverance and knowledge are underestimated strengths. Each failure is a new learning curve and you do not lose by trying. You have already lost when you do nothing.

Interviewers: **Given what you know about the evolution of technology and how we have dealt with them, what are the important lessons that we should put to good use in order to ensure that Malaysia can take advantage of what will be on offer tomorrow?**

Ts. Liew Choon Lian: We should adapt quickly when change happens. Take the story of Apple for example, which took the world by storm and replaced Nokia as the leading producer of mobile devices almost overnight. If Nokia had adapted by making products that could compete with Apple's iPhones, it could have remained a market leader. Innovative mindset, creative thinking, leadership skills and preparedness are valuable, but adaptability is vital.

Interviewers: **As MBOT Board Member, what do you think is the most important agenda for MBOT to work on so that our technologists and technicians are capable of taking Malaysia to greater heights?**

Ts. Liew Choon Lian: I think it is important for MBOT to garner a higher number of professionals as members, as well as to conduct regular training sessions to assist them elevate their skillsets.

Interviewers: **In your opinion, what tools and/or skills will be most needed in the years to come?**

Ts. Liew Choon Lian: I think skills related to Robotics, Artificial Intelligence, FinTech, Cybersecurity, Smart Technologies and Metaverse, and the integration of these technologies into existing systems, will be very useful in the coming years as this is where the future of technology is.

Interviewers: **What do you think the average Malaysian should do to remain relevant in the future?**

Ts. Liew Choon Lian: We know that technology is the future so, I would recommend people to enhance their proficiency in leadership-related and technology-related subjects such as Technology Leadership, Computer Science, AI, Robotics, Software Engineering, Smart Technology and a myriad of other options.

Interviewers: **Please share with us how you spend your free time.**

Ts. Liew Choon Lian: I spend time with my family as much as I can. Aside from that, I enjoy reading and learning new things.

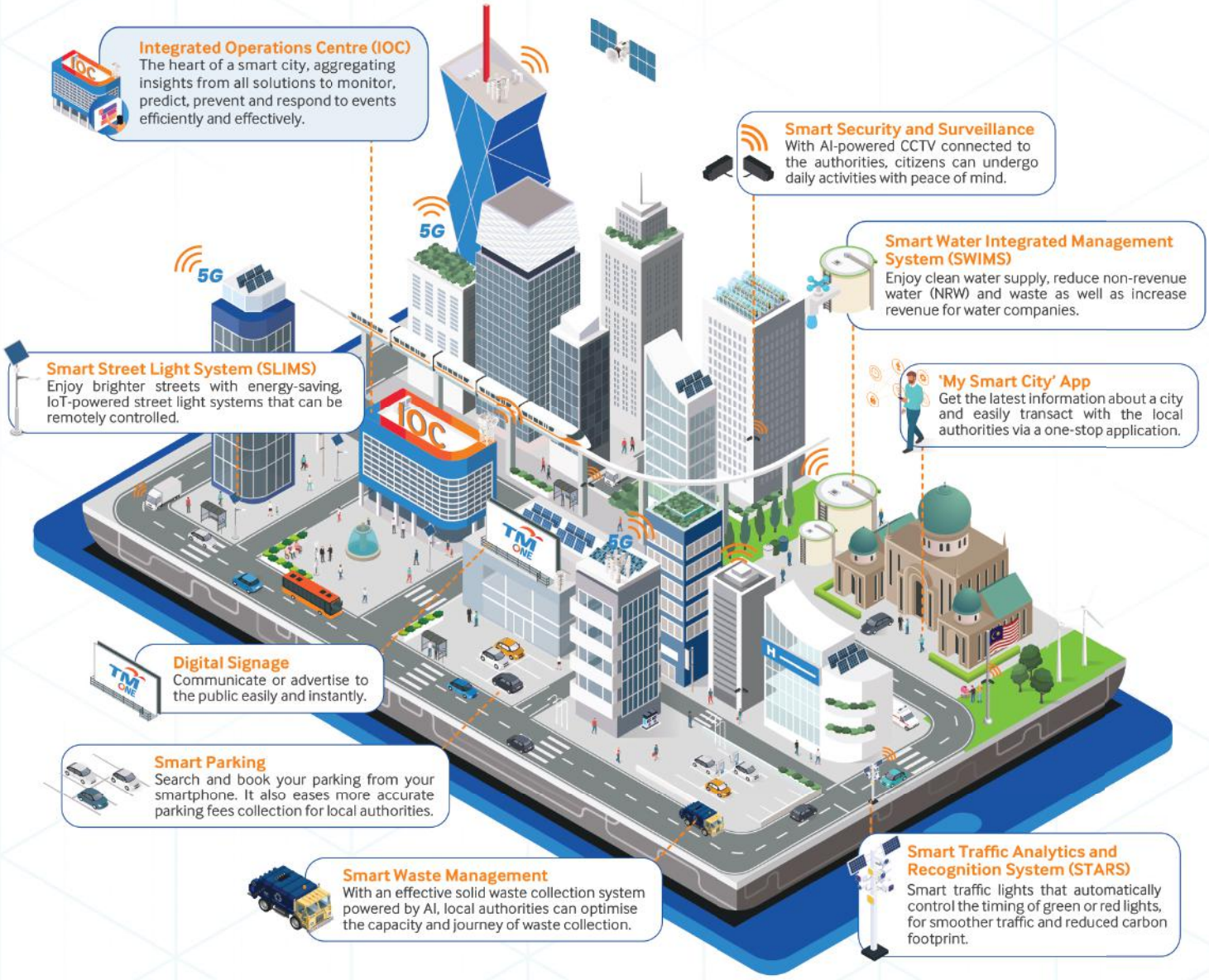
"I think skills related to Robotics, Artificial Intelligence, FinTech, Cybersecurity, Smart Technologies and Metaverse, and the integration of these technologies into existing systems, will be very useful in the coming years as this is where the future of technology is."

5G

TM ONE

Smart Cities

How Solutions Built For Citizens Create Liveable Cities



Integrated Operations Centre (IOC)
The heart of a smart city, aggregating insights from all solutions to monitor, predict, prevent and respond to events efficiently and effectively.

Smart Security and Surveillance
With AI-powered CCTV connected to the authorities, citizens can undergo daily activities with peace of mind.

Smart Water Integrated Management System (SWIMS)
Enjoy clean water supply, reduce non-revenue water (NRW) and waste as well as increase revenue for water companies.

Smart Street Light System (SLIMS)
Enjoy brighter streets with energy-saving, IoT-powered street light systems that can be remotely controlled.

'My Smart City' App
Get the latest information about a city and easily transact with the local authorities via a one-stop application.

Digital Signage
Communicate or advertise to the public easily and instantly.

Smart Parking
Search and book your parking from your smartphone. It also eases more accurate parking fees collection for local authorities.

Smart Waste Management
With an effective solid waste collection system powered by AI, local authorities can optimise the capacity and journey of waste collection.

Smart Traffic Analytics and Recognition System (STARS)
Smart traffic lights that automatically control the timing of green or red lights, for smoother traffic and reduced carbon footprint.

TM One is Local Authorities' trusted Smart City partner in realising the Malaysia Smart City Framework (MSCF) aspirations with our end-to-end, secured, robust and integrated managed services and smart solutions.

- **Nationwide digital connectivity**
- **Secure cloud platform**
- **Powered by Artificial Intelligence, analytics and IoT**
- **Secure data centre within Malaysia**
- **Certified team of professional services**

For more information, please contact your Account Manager or scan this QR code.

TM Group

By Nur Syuhana Binti Zamjuri, Ts. Dr. Khairul Huda Binti Yusof, Ts. Dr. Ahmad Sukri Ahmad,
Faculty of Information Science & Engineering, Management & Science University, Malaysia

Increasing Premise Security and Safety: Smart Receptionist with Smart Lock System

Security and safety are undeniably two major concerns in our everyday life. Hence, a myriad of new technologies has been created to be a part of people's lives and organisations [1]. A project was initiated, whereby, a smart receptionist system that minimised human interaction with outsiders, was the objective.

The system enabled home dwellers to not have to walk to the door to check on their visitors due to the use of the ESP32-CAM. However, the product required physical keys to operate the entrance, and no monitoring system was in place.

Thus, an improved smart lock system, complete with a guest-cam-and-screen for display at the entrance door, is proposed, as shown in Figure 1. The new system is called Smart Receptionist with Smart Lock System using ESP32-CAM. It is a simple and low-cost wireless security system for home and other premises [2].

When a visitor presses the bell, the camera at the door automatically captures the visitor's image and sends the image to a receptionist database. From there, the receptionist can approve or reject the visitor's entrance to the premise. If approved, the door will automatically open. On the other hand, if the receptionist declines the entrance request, the screen will display a message that authorisation is not given, and the door will remain locked.

Figure 1: Prototype of proposed project.

SMART RECEPTIONIST WITH SMART LOCK SYSTEM DESIGN

The system's software coding uses Arduino Integrated Development in C language. It is adaptable, convenient, and can be remotely controlled using an Android application, which is the Blynk app.

Figure 2 shows the process flow of the proposed module. When the system power is ON, it will initialise all connected components, namely the camera, LCD, red buzzer button, and the ESP32-Cam.

Once the module is powered up, it will connect with the WiFi registered in the software coding. Blynk, which is specifically created for the module, is also connected to the same internet connection. The Blynk app allows users to take pictures of the visitor at the front door where the module is located, as well as to unlock and lock the door remotely, as shown in Figure 3.

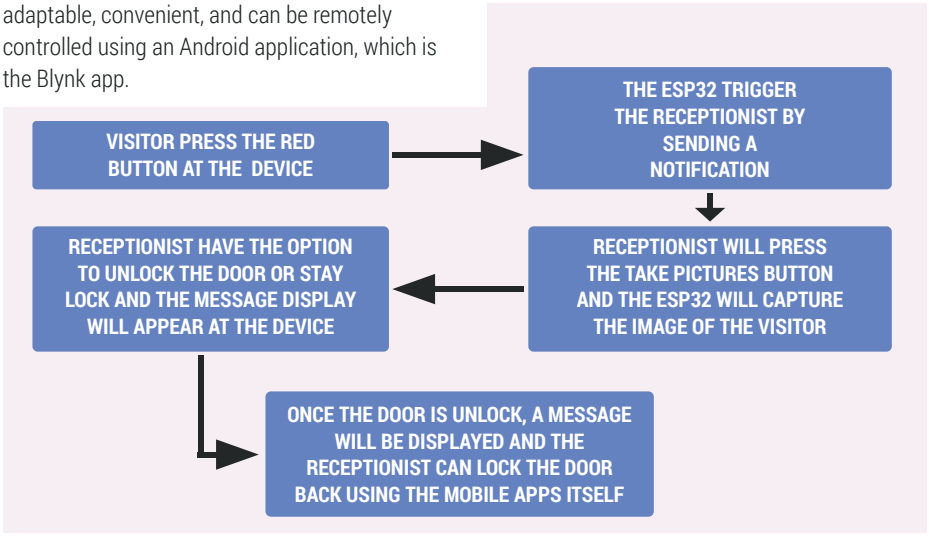


Figure 2: The process flow of the proposed module.

Figure 3: Interface of The Android Apps (Blynk Apps)

The module has an LCD to display messages from the user to the visitor. Once the visitor presses the red button, the user will receive a notification via the Blynk app, saying "Someone is at the door, take picture", while, the LCD on the module displays a message saying "Please wait for a moment". Figure 4 shows the notification received via the Blynk app to alert the user. The user then can take the photo of the visitor and unlock the door using the app. The user may take several pictures of the visitor, but the Blynk app will only show the current image taken by the user.

Figure 4: Notification received via the Blynk app.

Figure 5 shows the display message that is programmed for the visitor while waiting at the front door. The message can be customised by the user by amending the programming in the Arduino IDE software. The ESP32-Cam is the main hardware of the system. It controls the solenoid to lock or unlock the door, as shown in Figure 6.

Figure 5: Display Message shown by LCD for Visitor.

Figure 6: ESP32-Cam Internal Architecture.

CONCLUSION

The Smart Receptionist with Smart Lock System using ESP32-CAM is designed for security purposes, where the end user can remotely control the access of visitors. With enhanced design and added features, the system allows for reduced human interaction and intervention, hence increasing the overall safety of the user in the premise.

REFERENCES

1. Ajao LA, Kolo JG, Adedokun EA, Olaniyi OM, Inalegwu OC, Abolade SK SF J Telecommunic, 2018, 2:2, A Smart Door Security-Based Home Automation System: An Internet Things, SCIFED Publisher.

2. Su Zin Zin Win, Zaw Min Min Htun, Hla Myo Tun. Smart Security System For Home Appliance Control Based OnInternet Of Things. International Journal Of Scientific & Technology Research Volume 5, Issue 06, June 2016.

CONSTRUCTION 4.0

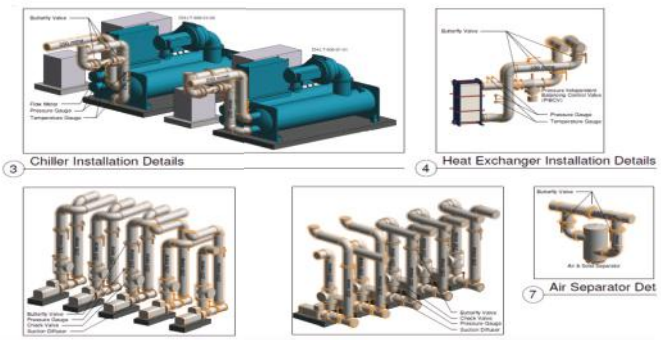
PLYTEC®

Technology Transformation Partner
Towards Construction Industrialization & Digitalization.

Industrialized Building Systems (IBS)

Prefabricated, Prefinished Volumetric Construction (PPVC)

Building Information Management (BIM)



Integrated Digital Delivery (IDD)

PLYTEC HOLDING SDN. BHD.
No. 19, Jalan Meranti Permai 3, Meranti Permai Industrial Park, Batu 15, Jalan Puchong, 47100 Puchong, Selangor.
Tel: +603-8061 2888 Fax: +603-8061 4888
For more information, call Ts. Ir. Edward Han L.K. +6012 - 273 7998 Ts. Rex Chu W.L. +6016 - 939 3158

BUILD SMARTER. BUILD FASTER.

www.plytec.com.my

Technologists: Malaysia's Future Workforce

The Fourth Industrial Revolution, often abbreviated IR 4.0, advances what has been achieved in IR 3.0. It is a tipping point in technology that unveils unprecedented scientific and technological progress.

There are nine main pillars of IR 4.0, namely, cyber-physical systems, Internet of Things, big data, 3D printing, robotics, simulation, augmented reality, Cloud computing, and cyber security [1].

IR4.0 embodies new opportunities and solutions that enhance the way the manufacturing sector creates, manufactures, improves and distributes its products and services using modern smart technology. Functions such as storage systems, intelligent machines and production facilities are merged to create an efficient industrial ecosystem known as the smart factory, which is not just automated but is highly intelligent as well [2].

Smart factories operate autonomously through the entire value chain, hence eliminating many routine tasks and subsequently producing new

> "Smart factories operate autonomously through the entire value chain, hence eliminating many routine tasks and subsequently producing new jobs – some of which, as of now, are yet to be invented. No doubt, a pool of trained workforce who are capable of harnessing the power of technology is direly needed. This is where technologists come in handy!"

who are capable of harnessing the power of technology is direly needed. This is where technologists come in handy!
As stipulated in the National Fourth Industrial Revolution policy [3], which was launched in 2021, Malaysia has set the direction to become a high-income nation through the use of technology by 2030. As such, highly skilled workforce who can handle complex and challenging activities is necessary. It goes without saying - workers whose skill sets are no longer relevant and are at odds with IR 4.0 should update themselves in order to remain relevant. Consequently, the Malaysian Board of Technologists (MBOT) should play a major role in ensuring and nurturing Malaysian technologists to meet the demands of the manufacturing sector, not only at the base level, but also up to professional ranks.

In this decade, the term 'technologist' has become increasingly popular. Most Malaysians do not know the difference between a technologist and an engineer. Hence it is worth stating here that an engineer is a person who develops potential solutions of problems by drawing upon theoretical concepts and ideas, while a technologist turns the concepts stipulated by the engineer into concrete and practical tools or gadgets that are actually used to solve the problems. Being a developing country, the convergence of human competency and machine capability is the key aspect in Malaysia's IR 4.0 transformation, thus it can be claimed that technologists are the main force in this process as opposed to engineers.

Although IR4.0 means there will be more robots and automation on the manufacturing shop floor, humans still play a big role, hence employee headcount remains more or less the same. Factories go for job redeployment due to the change in skill set requirements. As indicated by McKee & Gauch [4], it is likely that 50% of jobs available today will disappear in ten years, and new jobs will take their place. This is not intended to fully take over from human workers for the sake of increase in productivity and profitability, rather, it is to help in the operation of 3D (difficult, dirty and dangerous) tasks, hence subsequently enabling human workers to pursue creative activities which can take the manufacturing sector to greater heights.

For example, in the automotive manufacturing sector, the manufacturing of a car's engine block is mainly done in the casting process, where a molten metal is poured into a mould, and then cooled, and later extracted from the mould. The block then goes through a machining process for surface finish and dimensional accuracy. The procedure consumes high resources and generates much waste, with particularly high risks on human workers who work in the area. With a new generation of 3D printing, car engine blocks are built layer-by-layer from bottom to top. This capability minimises human intervention and is a great ally of the environment as it has less consumption of resources and generation of waste. This technology needs minimum hand skills, and hence is quite simple to implement. However, it requires practitioners of technology to approve and certify the 3D printing work methods. Put it another way, this is why technologists are crucial to have around.

The Government has targeted for Malaysia to become a high-income nation through the use of technology in nine years, thus, creating and sustaining a large pool of capable technologists is a very important agenda. Everyone should accept and embrace this inescapable future, for, no one is exempted from the consequences that technology brings.

References

1. F. Yang, and S. Gu, (2021) Industry 4.0, A Revolution That Requires Technology and National Strategies, Complex & Intelligent Systems, vol. 7, pp. 1311-1325.

2. G. Tommaso, C. Chiara, S. Cecilia, and R. Alessandro, (2021) Industry 4.0 Tools in Lean Production: A Systematic Literature Review, Procedia Computer Science, vol. 180, pp. 394-403.

3. Malaysia Board of Technologists, (2021) Dasar 4IR Pacu Transformasi Menerusi Teknologi. Retreived from: https://www.mbot.org.my/media/news/dasar-4ir-pacutransformasi-menerusi-teknologi/.

4. S. McKee, and D. Gauch, (2020) Implications of Industry 4.0 on Skills Development", (Springer, Singapore).

Mengenai MBOT ENTICE 2022

MBOT ENTICE 2022 (Experts Network in Technology, Innovation and Cooperative Event) yang bertemakan Elevate the Standing, Visibility and Recognition of Technologists and Technicians adalah penjenamaan semula program Townhall yang sebelum ini adalah perhimpunan tahunan bagi ahli-ahli profesional MBOT. Tujuan penjenamaan semula ini adalah untuk mempromosikan dengan lebih efektif fungsi-fungsi utama MBOT iaitu Pendaftaran, Akreditasi, Ketetapan Amalan Dan Pembelajaran Sepanjang Hayat kepada komuniti.

Bertemakan "3i - Innovate, Inspire, Inculcate", program ini dijangka akan dihadiri oleh seramai 250 orang peserta. Ahli-ahli profesional MBOT yang menyertai program ini adalah layak untuk diberikan mata jam CPD (tertakluk pada terma dan syarat).

Penutupan dan Penyampaian Hadiah MTeX'21

MTeX
MBOT TECHNOLOGY & INNOVATION EXPO 2021
TECHNOLOGICAL TALENT FOR SUSTAINABLE DEVELOPMENT

MBOT Technology and Innovation Expo 2021 (MTeX'21) adalah satu program berbentuk pertandingan inovasi dengan penyertaan dari tiga kategori iaitu kategori profesional, pelajar tahun akhir ijazah serta diploma. Tujuan pertandingan adalah bagi memupuk budaya inovasi, kreativiti serta menerapkan elemen pengkomersialan di dalam inovasi tersebut.

Pelancaran TechZone

TECHZONE
MALAYSIA BOARD OF TECHNOLOGISTS

TechZone adalah satu platform untuk menggalakkan perkongsian kepakaran dan meningkatkan pemindahan pengetahuan berkaitan teknologi serta menghubungkan ahli-ahli profesional MBOT di bawah satu rangkaian strategik. Sebanyak enam (6) Institusi Pengajian Tinggi (IPT) telah terpilih untuk mewakili 5 zon iaitu Zon Lembah Klang, Zon Pantai Timur, Zon Selatan, Zon Utara dan Zon Borneo.

Majlis Pertukaran Memorandum antara Panel Pakar Teknologi

Pemeteraian Memorandum Persefahaman (MOU) akan menyaksikan lantikan rakan strategik sebagai Panel Pakar Teknologi (TEP). TEP bertindak sebagai penasihat MBOT untuk menyelia Bidang Teknologi dan Teknikal yang diiktiraf oleh MBOT serta membantu MBOT dalam menjalankan fungsinya termasuk Akreditasi Akademik, Penilaian Profesional, Ketetapan Amalan dan Pembelajaran Sepanjang Hayat.

Bengkel Penambahbaikan Kaedah Penilaian Profesional 3.0

Sesi pemurnian dan pembangunan Kaedah Penilaian Profesional 3.0 bagi menjamin kualiti penilaian profesional MBOT di tahap terbaik serta taklimat mengenai peranan dan kod etika Panel Penilai Profesional MBOT

Bengkel Pemakluman TTAC Standard Second Edition

Sesi taklimat kepada Pusat Pengajian Tinggi berkaitan Technology and Technical Accreditation Standards edisi terkini bagi permohonan akreditasi di bawah Majlis Akreditasi Teknologi dan Teknikal (TTAC) MBOT.

24 FIELDS OF TECHNOLOGY & TECHNICAL

RECOGNISED BY MBOT

EE Electrical & Electronics Technology

IT Information & Communication Technology

CM Chemical Technology

TB Telecommunication & Broadcasting Technology

BT Biotechnology

BC Building & Construction Technology

RB Resource Based, Survey & Geomatics Technology

ME Manufacturing & Industrial Technology

AF Agro-based Technology

CS Cyber Security Technology

TL Transportation & Logistics Technology

MT Material Science Technology

MR Marine Technology

MI Maritime Technology

AC Atmospheric Science & Environment Technology

GT Green Technology

OG Oil & Gas Technology

AT Automotive Technology

AV Aerospace & Aviation Technology

FT Food Technology

NT Nanotechnology

NR Nuclear & Radiological Technology

AM Art Design & Creative Multimedia Technology

HM Health & Medical Technology

www.mbot.org.my

Malaysia Board of Technologists @mbot.my @mbot_my Malaysia Board of Technologists